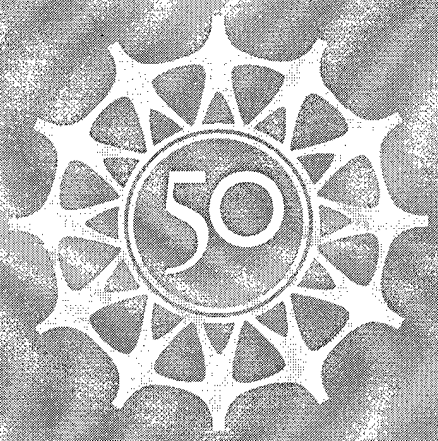
SCIENCE AND ENGINEERING INDICATORS 2000

VOLUME 2

Appendix Tables



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SCIENCE & ENGINEERING INDICATORS 2000

Volume 2–Appendix Tables

NSB NATIONAL SCIENCE BOARD

List of Appendix Tables

Chapter 1. Science and Technology in Times of Transition: the 1940s and 1990s

1-1 Nobel Prize awards: 1950–99 ..... A-1

Chapter 2. U.S. and International Research and Development: Funds and Alliances

2-1 Gross domestic product and GDP implicit price deflators: 1940–2004 ..... A-13
2-2 Purchasing power parity and market exchange rates, by selected country: 1981–99 ..... A-15
2-3 U.S. R&D expenditures, by performing sector and source of funds: 1953–98 (current dollars) A-16
2-4 U.S. R&D expenditures, by performing sector and source of funds: 1953–98 (constant dollars) A-18
2-5 U.S. R&D expenditures, by source of funds and performer: 1953–98 (current dollars) A-20
2-6 U.S. R&D expenditures, by source of funds and performer: 1953–98 (constant dollars) A-22
2-7 U.S. basic research expenditures, by performing sector and source of funds: 1953–98 (current dollars) A-24
2-8 U.S. basic research expenditures, by performing sector and source of funds: 1953–98 (constant dollars) A-26
2-9 U.S. basic research expenditures, by source of funds and performer: 1953–98 (current dollars) A-28
2-10 U.S. basic research expenditures, by source of funds and performer: 1953–98 (constant dollars) A-30
2-11 U.S. applied research expenditures, by performing sector and source of funds: 1953–98 (current dollars) A-32
2-12 U.S. applied research expenditures, by performing sector and source of funds: 1953–98 (constant dollars) A-34
2-13 U.S. applied research expenditures, by source of funds and performer: 1953–98 (current dollars) A-36
2-14 U.S. applied research expenditures, by source of funds and performer: 1953–98 (constant dollars) A-38
2-15 U.S. development expenditures, by performing sector and source of funds: 1953–98 (current dollars) A-40
2-16 U.S. development expenditures, by performing sector and source of funds: 1953–98 (constant dollars) A-42
2-17 U.S. development expenditures, by source of funds and performer: 1953–98 (current dollars) A-44
2-18 U.S. development expenditures, by source of funds and performer: 1953–98 (constant dollars) A-46
2-19 Trends in Federal and non–Federal R&D expenditures: 1953–98 ..... A-48
2-20 State R&D expenditures, by performing sector and source of funds: 1997 ..... A-49
2-21 Total R&D and GSP, by state: 1997 ..... A-51
2-22 Trends in R&D and Federal outlays: FYs 1970, 1980, 1990, and proposed 2000 ..... A-53
2-23 Federal R&D budget authority, by budget function: fiscal years 1980–2000 ..... A-54
2-24 Federal basic research funding, by budget function: FYs 1980, 1985, and 1990–2000 ..... A-56
2-25 Federal obligations for research and development: FY 1967–99 (current dollars) A-58
2-26 Federal obligations for research and development: FY 1967–99 (constant dollars) A-59
2-27 Federal obligations for basic research: FY 1970–99 (current dollars) A-60
2-28 Federal obligations for basic research: FY 1970–99 (constant dollars) A-61
2-29 Federal obligations for applied research: FY 1970–99 (current dollars) A-62
2-30 Federal obligations for applied research: FY 1970–99 (constant dollars) A-63
2-31 Federal obligations for development: FY 1970–99 (current dollars) A-64
2-32 Federal obligations for development: FY 1970–99 (constant dollars) A-65
2-33 Federal obligations for R&D Plant: FY 1967–99 (current dollars) A-66
2-34 Federal obligations for R&D Plant: FY 1967–99 (constant dollars) A-67
2-35 Federal obligations for R&D and R&D Plant: FY 1967–99 (current dollars) A-68
2-36 Federal obligations for R&D and R&D Plant: FY 1967–99 (constant dollars) A-69
2-37 Federal obligations for R&D, by character of work and performer: FYs 1987–97 ..... A-70
2-38 Estimated Federal obligations for R&D, by selected agency, performer, and character of work: FY 1999 ..... A-72

2-39 Federal R&D obligations for Federal intramural performance, by selected agency: FYs 1980–99 ..... A-74
2-40 Federal R&D obligations to FFRDCs, by administering sector and selected sponsoring agency: FYs 1987–99 ..... A-75
2-41 Federal obligations for R&D to federally funded research and development centers, by individual FFRDC and agency: FY 1997 ..... A-76
2-42 Federal R&D laboratory campuses, by agency and state: FY 1995 ..... A-78
2-43 Independent research and development (IR&D) support: FYs 1963–98 ..... A-79
2-44 Small Business Innovation Research awards, by award type and agency: FYs 1983–97 ..... A-81
2-45 Budgetary impact of the Federal research and experimentation tax credit: FYs 1981–99 ..... A-82
2-46 Estimated Federal obligations for research, by agency and field of science and engineering: FY 1997 ..... A-83
2-47 Federal obligations for basic research, by agency and field of science and engineering: FYs 1985–99 ..... A-84
2-48 Federal obligations for applied research, by agency and field of science and engineering: FYs 1985–99 ..... A-87
2-49 R&D associated primarily with chemistry (nonmedical) and chemical engineering: 1985–97 ..... A-90
2-50 R&D associated primarily with the life sciences A-91
2-51 R&D associated primarily with mathematics, computer sciences, and communication and electrical equipment (excluding DOD–supported development of military equipment): 1985–97 ..... A-92
2-52 Manufacturing and nonmanufacturing R&D expenditures: 1970–97 ..... A-93
2-53 Total expenditures for industrial R&D (financed by company, Federal, and other funds), by industry and size of company: 1985–97 ..... A-95
2-54 Company and other (except Federal) funds for industrial R&D performance, by industry and size of company: 1985–97 ..... A-97
2-55 Federal funds for industrial R&D performance, by industry and size of company: 1985–97 ..... A-99
2-56 Concentration of total, Federal, company, and other R&D funds and net sales of R&D–performing companies, by size of R&D program: 1985–97 ..... A-101
2-57 Company and other (except Federal) R&D funds as a percentage of net sales by industry and size of company: 1985–97 ..... A-102
2-58 The 100 leading industrial R&D companies, ranked by size of R&D expenditures in 1997 ..... A-104
2-59 Discrepancy between Federal R&D support as reported by performers and by Federal agencies: 1980–98 ..... A-107
2-60 Indicators of Federal technology transfer activities: FYs 1987–98 ..... A-108
2-61 Advanced Technology Program awards: 1990–98 ..... A-110
2-62 Number of new joint research filings, by year and by selected industry: 1985–98 ..... A-111
2-63 International R&D expenditures and R&D as a percentage of GDP: 1981–98 ..... A-112
2-64 International nondefense R&D expenditures and R&D as a percentage of GDP: 1981–98 ..... A-114
2-65 International R&D expenditures, by performing sector and source of funds: 1996–98 ..... A-115
2-66 Distribution of government R&D budget appropriations, by socioeconomic objective: 1997 or 1998 ..... A-117
2-67 International Strategic Technology Alliances: 1980–98 ..... A-119
2-68 Company–financed R&D performed abroad by U.S. companies and their foreign subsidiaries, by industry: 1985–97 ..... A-122
2-69 Expenditures for R&D performance by majority–owned nonbank foreign affiliates of U.S. parent companies, by region/country: 1982, 1989, and 1994–96 ..... A-124
2-70 Foreign R&D expenditures in the United States, by industry and region/country: 1980–96 ..... A-125
2-71 R&D expenditures in the United States by majority–owned nonbank U.S. affiliates of foreign companies, by industry of affiliate and country of ultimate beneficial owner: 1980 and 1987–96 ..... A-126
2-72 Proportion of industrial R&D expenditures financed from foreign sources, by selected country: 1980-98 ..... A-128

Chapter 3. Science and Engineering Workforce

3-1 U.S. scientists and engineers, by S&E degree status and labor force status: 1997 ..... A-129
3-2 Educational attainment of employed U.S. scientists and engineers, by level and field of highest degree and broad occupation category: 1997 ..... A-130

3-3 Employed U.S. scientists and engineers, with job closely related to field of highest degree, by degree level, field of highest degree, and years since degree: 1997 ..... A-134
3-4 Employed U.S. scientists and engineers with job closely or somewhat related to field of highest degree, by degree level, field of highest degree, and years since degree: 1997 ..... A-136
3-5 U.S. scientists and engineers, by highest degree attained, occupation, and employment status: 1997 ..... A-138
3-6 Employed U.S. scientists and engineers, by highest degree attained, occupation, and employment sector: 1997 ..... A-142
3-7 Median annual salaries of U.S. scientists and engineers, by occupation and highest degree attained: 1997 ..... A-147
3-8 Median annual salaries of U.S. scientists and engineers, by highest degree attained, occupation, sex, and years since degree: 1997 ..... A-148
3-9 Employed U.S. scientists and engineers, by highest degree attained, occupation, sex, and years since degree: 1997 ..... A-152
3-10 Employed U.S. scientists and engineers, by highest degree attained, occupation, sex, and race or ethnicity: 1997 ..... A-155
3-11 U.S. scientists and engineers, by highest degree attained, broad occupation, sex, and employment status: 1997 ..... A-157
3-12 Employed U.S. scientists and engineers, by highest degree attained, broad occupation, sex, and employment sector: 1997 ..... A-161
3-13 U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and employment status: 1997 ..... A-165
3-14 Employed U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and years since degree: 1997 ..... A-171
3-15 Employed U.S. scientists and engineers, by highest degree attained, occupation, race or ethnicity, and employment sector: 1997 ..... A-177
3-16 Median annual salaries of U.S. scientists and engineers, by highest degree attained, occupation, race or ethnicity, and employment sector: 1997 ..... A-183
3-17 Median annual salaries of U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and years since degree: 1997 ..... A-189
3-18 Number, employment status, and median salary of 1995 and 1996 bachelor's and master's degree recipients, by field of degree: 1997 ..... A-195
3-19 Number of U.S. scientists and engineers in the labor force, by sex, race/ethnicity, and age: 1997 ..... A-196
3-20 S&E degree holders working through a temporary help or employment agency (percent): 1997 ..... A-197
3-21 S&E trained U.S. scientists and engineers in the labor force, by degree level, tenure status at four-year educational institutions, and age: 1997 ..... A-198
3-22 Older S&E degreed individuals working full-time: 1997 ..... A-201
3-23 Number of foreign-born S&E degree holders, by place of birth: 1997 ..... A-202
3-24 INS permanent visas issued, by S&E occupation: 1988-98 ..... A-203
3-25 Scientists and engineers engaged in R&D, and per 10,000 labor force population, by country: 1979–97 ..... A-204
3-26 Science and engineering trained R&D workers: 1997 ..... A-205
3-27 Employed U.S. scientists and engineers, percent with Research and Development as a primary or secondary work activity, by degree level and field of highest degree: 1997 ..... A-206
3-28 Total science and engineering jobs: 1998 and projected 2008 ..... A-208

Chapter 4. Higher Education in Science and Engineering

4-1 U.S. institutions of higher education, by type and control: 1953–94 (selected years) A-209
4-2 Enrollment in higher education, by Carnegie institution type: 1967–96 ..... A-210
4-3 Science and engineering degrees, by degree level and institution type: 1996 ..... A-211
4-4 Institutions awarding science and engineering degrees, by degree level and institution type: 1996 ..... A-212

4-5 Science and engineering degrees earned by underrepresented minorities at the bachelor's level, by institution type: 1977, 1987, 1996 ..... A-213
4-6 Baccalaureate-origin institutions of 1991–95 science and engineering doctorate recipients, by Carnegie institution type A-215
4-7 Population of 20- to 24-year-olds in selected countries/regions: 1975–2010 ..... A-216
4-8 Percentage of freshmen intending to major in science and engineering, by field, sex, and race/ethnicity: 1972–98 ..... A-217
4-9 Of freshmen intending to major in science and engineering, percentage by race/ethnicity and selected fields: 1971–98 ..... A-220
4-10 High school mathematics and science courses reported by entering freshmen, percentage by race/ethnicity: 1984 and 1998 ..... A-221
4-11 Level of proficiency in mathematics and science among 12th graders, percentage by race/ethnicity and sex: 1988 cohort in 1992 ..... A-222
4-12 Percentage of freshmen reporting need for remedial work in science or mathematics, by intended major and sex: 1977, 1989, 1997 ..... A-223
4-13 Undergraduate enrollment in engineering and engineering technology programs: 1979–98 ..... A-224
4-14 Engineering enrollment, by level and attendance pattern: 1979–98 ..... A-225
4-15 Remedial mathematics courses in higher education, percentage by type of institution: 1995 ..... A-226
4-16 Earned associate's degrees, by field and sex: 1975–96 ..... A-227
4-17 Earned bachelor's degrees, by field and sex: 1966–96 (selected years) A-228
4-18 Ratio of first university degrees and science and engineering degrees to the 24-year-old population, in selected countries, by region: 1997 or most recent year A-230
4-19 Science and engineering degrees earned within Asian universities in selected Asian countries, by level: 1975–97 ..... A-233
4-20 Percentage of total bachelor's degrees in science and engineering in selected countries/regions: 1997 or most recent year A-234
4-21 Graduate enrollment in science and engineering, by field and sex: 1975–97 ..... A-236
4-22 Graduate enrollment in science and engineering, by field, race/ethnicity, and citizenship: 1983–97 ..... A-237
4-23 Earned master's degrees, by field and sex: 1954–96 (selected years) A-239
4-24 Earned doctoral degrees in science and engineering, by field: 1950–65 (selected years) A-241
4-25 Earned doctoral degrees, by field and sex: 1970–97 (selected years) A-242
4-26 Earned doctoral degrees, by field and citizenship: 1986–97 ..... A-244
4-27 Earned doctoral degrees in science and engineering in selected countries and regions: 1997 or most recent year ..... A- 245
4-28 Doctoral degrees in science and engineering in selected Western industrialized countries, by field: 1975–97 ..... A-246
4-29 Doctoral degrees in science and engineering in selected Asian countries, by field: 1975–97 ..... A-248
4-30 Doctoral science and engineering degrees earned by Asian students within Asian and U.S. universities: 1975–97 ..... A-250
4-31 Doctoral science and engineering degrees earned by Chinese students within Chinese and U.S. universities: 1987–97 ..... A-251
4-32 Undergraduate enrollment, by race/ethnicity, citizenship, and sex: 1978–96 (selected years) A-252
4-33 Undergraduate enrollment in engineering, by sex, race/ethnicity, and citizenship: 1979–98 ..... A-253
4-34 Earned associate's degrees, by field and race/ethnicity: 1977–96 (selected years) A-254
4-35 Earned bachelor's degrees, by field, race/ethnicity, and citizenship: 1977–96 (selected years) A-256
4-36 First university degrees, and ratio of first university degrees and science and engineering degrees to the 24-year-old population, in selected countries, by sex: 1997 or most recent year A-258
4-37 Percentage distribution of first university degrees and science and engineering degrees earned by males and females in selected countries and regions: 1997 or most recent year A-259
4-38 Earned master's degrees, by field, race/ethnicity and citizenship: 1977–96 (selected years) A-260

4-39 Earned doctoral degrees, by field, race/ethnicity, and citizenship: 1977–97 (selected years) A-262
4-40 Earned doctoral degrees in science and engineering in selected countries and regions, by sex and field: 1997 or most recent year A-264
4-41 U.S. doctoral degrees in S&E fields earned by U.S. and foreign citizens: 1986–97 ..... A-266
4-42 Foreign doctoral recipients from U.S. universities who plan to stay in the United States, by field and region/country of origin: 1990–97 ..... A-267
4-43 Foreign science and engineering doctoral recipients from major countries of origin and their plans to stay in the United States: 1985–97 ..... A-277
4-44 Foreign doctoral recipients in science and engineering in 1992/93 who were working in the United States, by field and country: 1994–97 ..... A-278
4-45 Postdoctoral appointments in science and engineering, by citizenship status: 1988–97 ..... A-280
4-46 Science and engineering faculty in U.S. higher education, by teaching field and region of origin: 1997 ..... A-281
4-47 Foreign-born female science and engineering faculty in U.S. higher education, by teaching field and region of origin: 1997 ..... A-282
4-48 Major places of origin for foreign-born science and engineering faculty in U.S. higher education, by field and sex: 1997 ..... A-283

Chapter 5. Elementary and Secondary Education

5-1 Number and percent of related children under 18 in a household who are below the poverty level, by race/ethnicity: 1970–96 ..... A-284
5-2 Percentage of 15-to 24-year-olds (grades 10–12) who dropped out of school: 1976–97 ..... A-285
5-3 Estimates of resident population, for selected age groups: 1970–97 ..... A-286
5-4 Family characteristics of 6-to 12-year-olds and 15-to 18-year olds: 1972–97 ..... A-287
5-5 Charter schools in operation, by state: 1992-98 ..... A-288
5-6 Percentage and standard error of 9-year-old students at the indicated level of NAEP science achievement, by gender, race/ethnicity, and region: 1977–96 ..... A-289
5-7 Percentage and standard errors of 13-year-old students at the indicated level of NAEP science achievement, by sex, race/ethnicity, and region: 1977–96 ..... A-290
5-8 Percentage and standard errors of 17-year-old students at the indicated level of NAEP science achievement, by sex, race/ethnicity, and region: 1977–96 ..... A-291
5-9 Percentage and standard errors of 9-year-old students at the indicated level of NAEP mathematics achievement, by gender race/ethnicity, and region: 1978–96 ..... A-292
5-10 Percentage and standard errors of 13-year-old students at the indicated level of NAEP mathematics achievement, by gender, race/ethnicity, and region: 1978-96 ..... A-293
5-11 Percentage and standard errors of 17-year-old students at the indicated level of NAEP mathematics achievement, by gender, race/ethnicity, and region: 1978–96 ..... A-294
5-12 Trends in differences in average scale scores by race/ethnicity and gender A-295
5-13 Overall mean and average percentage correct on grade 4 TIMSS science assessment, by country and content area: 1994–95 ..... A-296
5-14 Overall mean and average percentage correct on grade 4 TIMSS mathematics assessment, by country and content area: 1994–95 ..... A-297
5-15 Overall mean and average percentage correct on grade 8 TIMSS science assessment, by country and content area: 1994–95 ..... A-298
5-16 Overall mean and average percentage correct on grade 8 TIMSS mathematics assessment, by country and content area: 1994–95 ..... A-299
5-17 Mean and standard errors on final year of secondary school TIMSS mathematics and science general knowledge assessment, by country: 1994–95 ..... A-300
5-18 Mean and standard errors on final year of secondary school TIMSS advanced mathematics and physics assessment, by country: 1994–95 ..... A-301

5-19 Percentage of students scoring in the top 10 percent on the TIMSS science and mathematics assessments, by country and grade: 1994–95 ..... A-302
5-20 TIMSS achievement means by subject and grade for selected countries: 1994–95 ..... A-303
5-21 Percentage of high school graduates earning credits in science courses, by gender: 1982, 1987, 1990, and 1994 ..... A-304
5-22 Percentage of high school graduates earning credits in mathematics courses, by gender: 1982, 1987, 1990, and 1994 ..... A-305
5-23 Percentage of high school graduates earning credits in science courses, by race/ethnicity: 1982, 1987, 1990, and 1994 ..... A-306
5-24 Percentage of high school graduates earning credits in mathematics courses, by race/ethnicity: 1982, 1987, 1990, and 1994 ..... A-307
5-25 Percentage of public schools and instructional rooms having access to the Internet, by school characteristics: 1994, 1997, and 1998 ..... A-308
5-26 Teachers' computer use practice by subject and level for U.S. teachers in grades 4 to 12 (not including physical education): 1997–98 ..... A-309

Chapter 6. Academic Research and Development: Financial and Personnel Resources, Support for Graduate Education, and Outputs

6-1 Total, federally funded, and non-federally funded academic R&D, by basic research, applied research, and development: 1953–98 ..... A-310
6-2 Support for academic R&D, by sector: 1953–98 ..... A-311
6-3 Sources of R&D funds at private and public institutions: 1977, 1987, and 1997 ..... A-314
6-4 R&D expenditures at the top 100 academic institutions, by source of funds: 1997 ..... A-315
6-5 Total, Federal, and non-Federal R&D expenditures at academic institutions, by field and source of funds: 1997 ..... A-318
6-6 Percentage of academic R&D funds federally financed, by field: 1973–97 ..... A-319
6-7 Expenditures for academic R&D, by field: 1973–97 ..... A-320
6-8 Federal obligations for academic R&D, by agency: 1970–99 ..... A-323
6-9 Federal obligations for academic research, by agency: 1970–99 ..... A-325
6-10 Distribution of Federal agency academic research obligations, by field: FY 1997 ..... A-327
6-11 Percentage of Federal academic research obligations provided by major agencies, by field: FY 1997 ..... A-328
6-12 Number of academic institutions receiving Federal R&D support, by selected Carnegie classification: 1971–97 ..... A-329
6-13 Square footage of total, new construction of, and repair/renovation of academic research space, by field: 1986–98 ..... A-330
6-14 Cost of academic research new construction and repair/renovation projects, by field: 1986–97 ..... A-331
6-15 Expected costs of deferred S&E research facility construction and repair/renovation needs, by field: 1998 ..... A-332
6-16 Current fund expenditures for research equipment at academic institutions, by field: 1981–97 ..... A-333
6-17 Current funds expenditures for research equipment federally financed, by field: 1981–97 ..... A-336
6-18 Current fund expenditures for research equipment at academic institutions as a percentage of total R&D expenditures, by field: 1981–97 ..... A-337
6-19 Academic employment of doctoral scientists and engineers, by type of position and field: 1973–97 ..... A-338
6-20 Academic doctoral scientists and engineers by type of institution, appointment, and primary work responsibility: 1973–97 ..... A-340
6-21 Recent S&E Ph.D.s in academia by type of institution, appointment, and primary work responsibility: 1973–97 ..... A-341
6-22 Academic employment of doctoral scientists and engineers, by degree field, sex, and type of position: 1973–97 ..... A-342

6-23 Academic employment of doctoral scientists and engineers, by degree field, race/ethnicity, and type of position: 1973–97 ..... A-347
6-24 Age distribution of academic doctoral scientists and engineers, by type of appointment: 1973–97 ..... A-354
6-25 Age distribution of full-time doctoral S&E faculty at research universities and other academic institutions: 1973–97 ..... A-355
6-26 Employment sector of recent S&E Ph.D.s, by sex and race/ethnicity: 1973–97 ..... A-356
6-27 Recent S&E Ph.D.s employed in higher education, by field and type of appointment: 1973–97 ..... A-357
6-28 Academic doctoral scientists and engineers with work responsibility for R&D, by type of appointment and degree field: 1973–97 ..... A-358
6-29 Academic doctoral scientists and engineers, by type of appointment and primary work responsibility: 1973–97 ..... A-363
6-30 Academic doctoral scientists and engineers, by type of appointment, degree field, and primary work responsibility: 1973–97 ..... A-364
6-31 Academic doctoral scientists and engineers with recent Ph.D.s, by appointment type and primary work responsibility: 1973–97 ..... A-367
6-32 Academic doctoral scientists and engineers reporting Federal support from one or more agencies, by field: 1973–97 ..... A-368
6-33 Full-time S&E graduate students, by source and mechanism of primary support: 1980–97 ..... A-370
6-34 Full-time S&E graduate students, by institution type, and source and mechanism of primary support: 1997 ..... A-372
6-35 Primary mechanisms of support for 1997 S&E Ph.D. recipients, by degree field A-373
6-36 Full-time S&E graduate students, by field and mechanism of primary support: 1997 ..... A-375
6-37 Primary mechanisms of support for 1997 S&E Ph.D. recipients, by citizenship, sex, and race/ethnicity A-377
6-38 Primary mechanisms of support for 1997 S&E Ph.D. recipients, by degree field and citizenship status A-378
6-39 Primary mechanisms of support for 1997 U.S. citizen-S&E Ph.D. recipients, by degree field and sex A-380
6-40 Primary mechanisms of support for 1997 U.S. citizen-S&E Ph.D. recipients, by degree field and race/ethnicity A-382
6-41 Full-time S&E graduate students with a research assistantship as mechanism of primary support, by field: 1980–1997 ..... A-384
6-42 Full-time S&E graduate students with a research assistantship as primary support mechanism, by field and primary source of support: 1997 ..... A-386
6-43 Percentage of full-time S&E graduate students with a research assistantship as primary support mechanism whose primary source of support is the Federal Government, by field: 1980–97 ..... A-387
6-44 Full-time S&E graduate students with a research assistantship as primary support mechanism, by Federal agency of primary support: 1980–97 ..... A-388
6-45 Field distribution of full-time S&E graduate students with a research assistantship as primary support mechanism, by Federal agency of primary support: 1997 ..... A-389
6-46 Federal agency distribution of full-time S&E graduate students with a research assistantship as primary support mechanism, by field: 1997 ..... A-390
6-47 Academic institutions reporting full-time S&E graduate students with a research assistantship as primary support mechanism, by primary source of support and type of institution: 1980–97 ..... A-391
6-48 Broad and fine fields for publications output data A-392
6-49 Distribution of U.S. scientific and technical articles, by sector and field: 1988–97 ..... A-393
6-50 Distribution of U.S. scientific and technical articles, by field and sector: 1989–97 ..... A-394
6-51 Incidence of multiple corporate authorship of U.S. scientific and technical articles, by field: 1988–97 ..... A-395
6-52 Patterns of cross-sectoral coauthorship of U.S. scientific and technical articles, by sector and field: 1988–91 and 1995–97 ..... A-404
6-53 Distribution of citations in U.S. scientific and technical articles to other U.S. articles, by sector and field: 1990–93 and 1994–97 ..... A-408
6-54 Distribution of citations in U.S. scientific and technical articles across broad and fine fields: 1997 ..... A-412

6-55 Scientific and technical articles, by country and field: 1986–97 ..... A-416
6-56 Percentage of world's scientific and technical articles in a set of major international journals, by country: 1986–97 ..... A-428
6-57 Gross domestic product and scientific and technical articles for selected countries: 1997 ..... A-429
6-58 Distribution of scientific and technical articles for selected countries, by field: 1986–97, selected years A-430
6-59 Changes in the field composition of scientific and technical articles for selected countries: 1986–88 to 1995–97 ..... A-436
6-60 Coauthored and internationally coauthored scientific and technical articles for selected countries, by field: 1986–97 ..... A-438
6-61 Patterns of international coauthorship in scientific and technical research for selected countries: 1986–97 ..... A-450
6-62 Citations to foreign literature in scientific and technical journals for selected countries, by field: 1990 and 1997 ..... A-459
6-63 Citations to U.S. literature in scientific and technical journals for selected countries, by field: 1990 and 1997 ..... A-463
6-64 Citations on U.S. patents to the U.S. scientific and technical literature, by cited field and sector: 1987–98 ..... A-467
6-65 Distribution of citations on U.S. patents to the U.S. scientific and technical literature, by field across sectors: 1987–98 ..... A-470
6-66 Distribution of citations on U.S. patents to the U.S. scientific and technical literature, within sectors by field: 1987–98 ..... A-473
6-67 U.S. patents awarded to U.S. universities with largest 1997 R&D volume and to other academic institutions: 1985–98 ..... A-476
6-68 Patents awarded to U.S. universities and colleges, by utility class and University Activity Index: 1969–98 ..... A-479

Chapter 7. Industry, Technology, and the Global Marketplace

7-1 Real gross domestic product, for selected countries: 1960–95 ..... A-481
7-2 Real gross domestic product per capita, for selected countries: 1960–96 ..... A-482
7-3 Real gross domestic product per employed person, for selected countries: 1960–96 ..... A-483
7-4 Global industry and trade data, by selected countries and industries: 1980–97 ..... A-484
7-5 Global industry and trade data for selected countries and service industries A-492
7-6 U.S. trade in advanced technology products: 1990–98 ..... A-494
7-7 U.S. receipts and payments of royalties and fees associated with affiliated and unaffiliated foreign residents: 1987–97 ..... A-530
7-8 U.S. receipts and payments of royalties and license fees generated from the exchange and use of industrial processes with unaffiliated foreign residents, by region and country: 1987–97 ..... A-531
7-9 R&D performance in the United States, by industry: 1973–96 ..... A-533
7-10 R&D performance in Japan, by industry: 1973–96 ..... A-534
7-11 R&D performance in the European Union, by industry: 1973–95 ..... A-535
7-12 Number of U.S. patents granted, by inventor residence, inventor sector, and year of grant: 1963–98 ..... A-536
7-13 Patents granted in selected countries, by inventor residence: 1985–96 ..... A-537
7-14 U.S. venture capital disbursements, by industry category: 1980–98 ..... A-538
7-15 U.S. venture capital disbursements, by financing stage: 1980–98 ..... A-539
7-16 U.S. venture capital disbursements as seed money, by industry category: 1980–98 ..... A-540

Chapter 8. Science and Technology: Public Attitudes and Public Understanding

8-1 Level of public interest in selected policy issues: 1979–99 (selected years) A-541
8-2 Level of public interest in selected policy issues: 1979–99 (selected years) A-542
8-3 Level of public interest in selected policy issues, by sex and level of education: 1999 ..... A-543
8-4 How well informed Americans think they are about selected policy issues: 1979–99 (selected years) A-544

8-5 How well informed Americans think they are about selected policy issues: 1979–99 (selected years) A-545
8-6 How well informed Americans think they are about selected policy issues, by sex and level of education: 1999 ..... A-456
8-7 Public attentiveness to selected policy issues: 1979–99 (selected years) A-547
8-8 Public attentiveness to scientific and technological issues, by sex and level of education: 1999 ..... A-548
8-9 U.S. public understanding of science vocabulary and concepts, by selected characteristics: 1999 ..... A-549
8-10 Mean score on Index of Scientific Construct Understanding, by selected characteristics: 1999 ..... A-550
8-11 Public understanding of the nature of scientific inquiry, by selected characteristics: 1999 ..... A-551
8-12 Responses to items included in the Index of Scientific Promise and the Index of Scientific Reservation: 1999 ..... A-552
8-13 Responses to and mean scores on the Attitude Toward Organized Science Scale, by selected characteristics: 1983–99 (selected years) A-553
8-14 Public assessment of the impact of computers and factory automation, by selected characteristics: 1985–99 (selected years) A-554
8-15 Public assessment that people would do better by living a simpler life, by selected characteristics: 1997, 1999 ..... A-556
8-16 Public assessment that technological discoveries will destroy the Earth, by selected characteristics: 1997, 1999 ..... A-557
8-17 Public assessment that technological development creates an artificial and inhuman way of living, by selected characteristics: 1997,1999 ..... A-558
8-18 General attitudes toward science and technology, by selected characteristics: 1992–99 (selected years) A-559
8-19 Public assessment of funding of scientific research by the Federal Government, by selected characteristics: 1985–99 ..... A-560
8-20 Percentage of adults agreeing that the Federal Government should support basic scientific research, by level of Index of Scientific Promise and the Index of Scientific Reservation: 1999 ..... A-561
8-21 Public preferences for government spending: 1981–99 (selected years) A-562
8-22 Public preferences for government spending, by selected characteristics: 1999 ..... A-563
8-23 Public confidence in the people running various institutions: 1973–98 ..... A-564
8-24 Public assessment of scientific research, by selected characteristics: 1979–99 (selected years) A-565
8-25 Public assessment of nuclear power, by selected characteristics: 1985–99 (selected years) A-566
8-26 Public assessment of genetic engineering, by selected characteristics: 1985-99 (selected years) A-568
8-27 Public assessment of space exploration, by selected characteristics: 1985–99 (selected years) A-570
8-28 Public assessment of the use of dogs and chimpanzees in scientific research, by selected characteristics: 1988–99 (selected years) A-572
8-29 Public assessment of the use of mice in scientific research, by selected characteristics: 1999 ..... A-574
8-30 Public's access to computers from work and home, by selected characteristics: 1983–99 (selected years) A-575
8-31 Public's access to computers from work and home, by selected characteristics: 1995, 1997, and 1999 ..... A-576
8-32 Public's access to and use of computers at home and work, by selected characteristics: 1999 ..... A-578
8-33 Public use of information on an annual basis, by selected characteristics: 1999 ..... A-579
8-34 Public use of various sources of information, by selected characteristics: 1999 ..... A-580
8-35 Percentage of the public reading a newspaper every day, by selected characteristics: 1979–99 (selected years) A-581
8-36 Percentage of the public visiting a science or technology museum one or more times per year: 1983–99 (selected years) A-582
8-37 Public assessment of the quality of science and mathematics education in the U.S., by selected characteristics: 1985–99 (selected years) A-583
8-38 Public assessment of astrology, by selected characteristics: 1979–99 (selected years) A-585
8-39 Frequency of reading astrology reports, by selected characteristics: 1985–99 (selected years) A-587
8-40 Public assessment of lucky numbers, by selected characteristics: 1988–99 (selected years) A-589

Chapter 9. Significance of Information Technologies

9-1 Moore's Law: The trend in the number of transistors per chip over time A-591
9-2 Number of Internet hosts A-592
9-3 Department of Commerce Classification of IT producing and using industries A-593
9-4 Gross product by industry as a share of gross domestic product: 1959–94 (selected years) A-594
9-5 Percentage of public schools with access to the Internet, and percentage of instructional rooms with access to the Internet, by school characteristics: 1994, 1997, and 1998 ..... A-595
9-6 Percentage distribution of 2-year and 4-year higher education institutions according to current or planned offering of distance education courses, by institutional characteristics: Fall 1995 and 1997–98 ..... A-596
9-7 Number of different distance education courses offered by 2-year and 4-year higher education institutions in 1994–95 and 1997–98, by institutional characteristics A-597
9-8 Percent of 2-year and 4-year higher education institutions offering distance education courses that used selected types of technologies to deliver distance education courses in 1995 and 1997–98, by institutional type A-598
9-9 Web site prevalence of international government agencies A-599
9-10 Annual labor earnings percentiles of adult males in 1997 CPI-U dollars, selected years: 1973–1995 ..... A-603

Appendix table 1-1.
Nobel Prize awards: 1950–99

Year	NSF Funding	Effort for which Nobel Prize awarded:	Laureate(s)
		Physics	
1950		The development of the photographic method of studying nuclear processes and the discoveries regarding mesons made with this method.	Cecil Frank Powell
1951		The pioneer work on the transmutation of atomic nuclei by artificially accelerated atomic particles.	Sir John Douglas Cockcroft; Ernest Thomas Sinton Walton
1952		The development of new methods for nuclear magnetic precision measurements and discoveries in connection therewith.	Felix Bloch; Edward Mills Purcell
1953		Demonstration of the phase contrast method, especially for his invention of the phase contract microscope.	Frits (Frederik) Zernike
1954		Fundamental research in quantum mechanics, especially for the statistical interpretation of the wavefunction; and for the coincidence method and the discoveries made therewith.	Max Born; Walther Bothe
1955		Discoveries concerning the fine structure of the hydrogen spectrum; and precision determination of the magnetic moment of the electron.	Willis Eugene Lamb; Polykarp Kusch
1956		Researches on semiconductors and the discovery of the transistor effect.	William Shockley; John Bardeen; Walter Houser Brattain
1957		Penetrating investigation of the so-called parity laws which has led to important discoveries regarding the elementary particles.	Chen Ning Yang; Tsung-Dao Lee
1958		The discovery and the interpretation of the Cherenkov effect.	Pavel Alekseyevich Cherenkov; Il'ja Mikhailovich Frank; Igor Yevgenyevich Tamm
1959		The discovery of the antiproton.	Emilio Gino Segre; Owen Chamberlain
1960	**	The invention of the bubble chamber.	Donald A. Glaser
1961	**	Pioneering studies of electron scattering in atomic nuclei and for the thereby achieved discoveries concerning the structure of the nucleons; and research concerning the resonance absorption of gamma radiation and the discovery in this connection of the effect which bears his name.	Robert Hofstadter; Rudolf Ludwig Mössbauer
1962		Pioneering theories for condensed matter, especially liquid helium	Lev Davidovich Landau
1963	**	Contributions to the theory of the atomic nucleus and the elementary particles, particularly through the discovery and application of fundamental symmetry principles; and discoveries concerning nuclear shell structure.	Eugene P. Wigner; Maria Goeppert-Mayer; J. Hans D. Jensen
1964		Fundamental work in the field of quantum electronics, which has led to the construction of oscillators and amplifiers based on the maser-laser principle.	Charles H. Townes; Nicolay Gennadiyevich Basov; Aleksandr Mikhailovich Prokhorov

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 1-1.
Nobel Prize awards: 1950–99

Year	NSF Funding	Effort for which Nobel Prize awarded:	Laureate(s)
		Physics, continued	
1965		Fundaments work in quantum electrodynamics, with deep-ploughing consequences for the physics of elementary particles.	Sin-Itiro Tomonaga; Julian Schwinger; Richard P. Feynman
1966		The discovery and development of optical methods for studying hertzian resonances in atoms.	Alfred Kastler
1967	**	Contributions to the theory of nuclear reactions, especially the discoveries concerning the energy production in stars.	Hans Albrecht Bethe
1968	**	Decisive contributions to elementary particle physics, in particular the discovery of a large number of resonance states, made possible through the development of the technique of using hydrogen bubble chamber and data analysis.	Luis W. Alvarez
1969	**	Contributions and discoveries concerning the classification of elementary particles and their interactions.	Murray Gell-Mann
1970		Fundamental work and discoveries in magneto-hydrodynamics with fruitful applications in different parts of plasma physics; and fundamental work and discoveries concerning antiferromagnetism and ferrimagnetism which have led to important applications in solid state physics.	Hannes Alfvén; Louis Néel
1971		Invention and development of the holographic method.	Dennis Gabor
1972	**	Theory of superconductivity, usually called the BCS-theory.	John Bardeen; Leon N. Cooper; J. Robert Schrieffer
1973		Experimental discoveries regarding tunneling phenomena in semiconductors and superconductors, respectively; and theoretical predictions of the properties of a super current through a tunnel barrier, in particular those phenomena which are generally known as the Josephson effects.	Leo Esaki; Ivar Giaever; Brian D. Josephson
1974		Pioneering research in radio astrophysics: observations and inventions, in particular of the aperture synthesis technique, and decisive role in the discovery of pulsars.	Sir Martin Ryle; Antony Hewish
1975	*	Discovery of the connection between collective motion and particle motion in atomic nuclei and the development of the theory of the structure of the atomic nucleus based on this connection.	Aage Bohr; Ben Mottelson; James Rainwater
1976	*	Pioneering work in the discovery of a heavy elementary particle of a new kind.	Burton Richter; Samuel C.C. Ting
1977		Fundamental theoretical investigations of the electronic structure of magnetic and disordered systems.	Philip W. Anderson; Sir Nevill F. Mott; John H. VanVleck
1978	*	Basic inventions and discoveries in the area of low-temperature physics; and the discovery of cosmic microwave background radiation.	Pyotr Leonidovich Kapitsa; Arno A. Penzias; Robert W. Wilson
1979	*	Contributions to the theory of the unified weak and electromagnetic interaction between elementary particles, including inter alia the prediction of the weak neutral current.	Sheldon L. Glashow; Abdus Salam; Steven Weinberg
1980	*	Discovery of violations of fundamental symmetry principles in the decay of neutral K-mesons.	James W. Cronin; Val L. Fitch

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 1-1.
Nobel Prize awards: 1950–99

Year	NSF Funding	Effort for which Nobel Prize awarded:	Laureate(s)
		Physics, continued	
1981	*	Contribution to the development of laser spectroscopy; and contribution to the development of high-resolution electron spectroscopy.	Nicolaas Bloembergen; Arthur L. Schawlow; Kai M. Siegbahn
1982	*	Theory for critical phenomena in connection with phase transitions.	Kenneth G. Wilson
1983	*	Theoretical studies of the physical processes of importance to the structure and evolution of the stars; and theoretical and experimental studies of the nuclear reactions of importance in the formation of the chemical elements in the universe.	Subramanyan Chandrasekhar; William A. Fowler
1984		Decisive contributions to the large project, which led to the discovery of the field particles W and Z, communicators of weak interaction.	Carlo Rubbia; Simon Van Der Meer
1985		Discovery of the quantized Hall effect.	Klaus Von Klitzing
1986		Fundamental work in electron optics, and the design of the first electron microscope; and the design of the canning tunneling microscope.	Ernst Ruska; Gerd Binnig; Heinrich Rohrer
1987		Important breakthrough in the discovery of superconductivity in ceramic materials.	J. Georg Bednorz; K. Alexander Müller
1988	*	The neutrino beam method and the demonstration of the doublet structure of the leptons through the discovery of the muon neutrino.	Leon M. Lederman; Melvin Schwartz; Jack Steinberger
1989	*	Invention of the separated oscillatory fields method and its use in the hydrogen maser and other atomic clocks; and the development of the ion trap technique.	Norman F. Ramsey; Hans G. Dehmelt; Wolfgang Paul
1990		Pioneering investigations concerning deep inelastic scattering of electrons on protons and bound neutrons, which have been of essential importance for the development of the quark model in particle physics.	Jerome I. Friedman; Henry W. Kendall; Richard E. Taylor
1991		Discovery that methods developed for studying order phenomena in simple systems can be generalized to more complex forms of matter, in particular to liquid crystals and polymers.	Pierre-Gilles de Gennes
1992		Invention and development of particle detectors, in particular the multiwire proportional chamber.	Georges Charpak
1993	*	Discovery of a new type of pulsar, a discovery that has opened up new possibilities for the study of gravitation.	Russell A. Hulse; Joseph H. Taylor, Jr.
1994	*	Pioneering contributions to the development of neutron scattering techniques for studies of condensed matter: the development of neutron spectroscopy, and for the development of the neutron diffraction technique.	Bertram N. Brockhouse; Clifford G. Shull
1995	*	Pioneering experimental contributions to lepton physics: for the discovery of the tau lepton, and the detection of the neutrino.	Martin L. Perl; Frederick Reines
1996	*	Discovery of superfluidity in helium-3.	David M. Lee; Douglas D. Osheroff; Robert C. Richardson

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 1-1.
Nobel Prize awards: 1950–99

Year	NSF Funding	Effort for which Nobel Prize awarded:	Laureate(s)
		Physics, continued	
1997	*	Development of methods to cool and trap atoms with laser light.	Steven Chu; Claude Cohen-Tannoudji; William D. Phillips
1998		Discovery of a new form of quantum fluid with fractionally charged excitations.	Robert B. Laughlin; Horst L. Störmer; Daniel C. Tsui
1999		Elucidation of the quantum structure of electroweak interactions in physics.	Gerardus 't Hooft; Martinus J.G. Veltman

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 1-1.
Nobel Prize awards: 1950–99

Year	NSF Funding	Effort for which Nobel Prize awarded:	Laureate(s)
		Chemistry	
1950		Discovery and development of the diene synthesis.	Otto Paul Hermann Diels; Kurt Alder
1951	**	Discoveries in the chemistry of the transuranium elements.	Edwin Mattison McMillan; Glenn Theodore Seaborg
1952		Invention of partition chromatography.	Archer John Porter Martin; Richard Laurence Millington Synge
1953		Discoveries in the field of macromolecular chemistry.	Hermann Staudinger
1954		Research into the nature of the chemical bond and its application to the elucidation of the structure of complex substances.	Linus Carl Pauling
1955		Work on biochemically important sulphur compounds, especially for the first synthesis of a polypeptide hormone.	Vincent du Vigneaud
1956		Researches into the mechanism of chemical reactions.	Sir Cyril Norman Hinshelwood; Nikolay Nikolaevich Semenov
1957		Work on nucleotides and nucleotide co-enzymes.	Lord Alexander R. Todd
1958		Work on the structure of proteins, especially that of insulin.	Frederick Sanger
1959		Discovery and development of the polarographic methods of analysis.	Jaroslav Heyrovsky
1960	**	Method to use carbon-14 for age determination in archaeology, geology, geophysics, and other branches of science.	Willard Frank Libby
1961		Research on the carbon dioxide assimilation in plants.	Melvin Calvin
1962		Studies of the structures of globular proteins.	Max Ferdinand Perutz; Sir John Cowdery Kendrew
1963		Discoveries in the field of the chemistry and technology of high polymers.	Karl Zeigler; Giulio Natta
1964		Determinations by X-ray techniques of the structures of important biochemical substances.	Dorothy Crowfoot Hodgkin
1965	**	Outstanding achievements in the art of organic synthesis.	Robert Burns Woodward
1966		Fundamental work concerning chemical bonds and the electronic structure of molecules by the molecular orbital method.	Robert S. Mulliken
1967		Studies of extremely fast chemical reactions, effected by disturbing the equilibrium by means of very short pulses of energy.	Manfred Eigen; Ronald George Wreyford Norrish; Lord George Porter
1968		Discovery of the reciprocal relations bearing his name, which are fundamental for the thermodynamics of irreversible processes.	Lars Onsager

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 1-1.
Nobel Prize awards: 1950–99

Year	NSF Funding	Effort for which Nobel Prize awarded:	Laureate(s)
		Chemistry, continued	
1969		Contributions to the development of the concept of conformation and its applications in chemistry.	Sir Derek H.R. Barton; Odd Hassel
1970		Discovery of sugar nucleotides and their role in the biosynthesis of carbohydrates.	Luis F. Leloir
1971		Contributions to the knowledge of electronic structure and geometry of molecules, particularly free radicals.	Gerhard Herzberg
1972	**	Work on ribonuclease, especially concerning the connection between the amino acid sequence and the biologically active conformation; and the contribution to the understanding of the connection between chemical structure and catalytic activity of the active center of the ribonuclease molecule.	Christian B. Anfinsen; Stanford Moore; William H. Stein
1973		Pioneering work, performed independently, on the chemistry of the organometallic, so-called sandwich compounds.	Ernst Otto Fischer; Sir Geoffrey Wilkinson
1974	**	Fundamental achievements, both theoretical and experimental, in the physical chemistry of the macromolecules.	Paul J. Flory
1975		Work on the sterochemistry of enzyme-catalyzed reactions; and research into the stereochemistry of organic molecules and reactions.	Sir John Warcup Cornforth; Vladimir Prelog
1976	*	Studies on the struction of boranes illuminating problems of chemical bonding.	William N. Lipscomb
1977		Contributions to nonequilibrium thermodynamics, particularly the theory of dissipative structures.	Ilya Prigogine
1978		Contribution to the understanding of biological energy transfer through the formulation of the chemiosmotic theory.	Peter D. Mitchell
1979	*	Development of the use of boron- and phosphorus-containing compounds, respectively, into important reagents in organic synthesis.	Herbert C. Brown; Georg Wittig
1980	*	Fundamental studies of the biochemistry of nucleic acids, with particular regard to recombinant-DNA; and contributions concerning the determination of base sequences in nucleic acids.	Paul Berg; Walter Gilbert; Frederick Sanger
1981	*	Theories, developed independently, concerning the course of chemical reactions.	Kenichi Fukui; Roald Hoffmann
1982		Development of crystallographic electron microscopy and his structural elucidation of biologically important nuclei acid-protein complexes.	Sir Aaron Klug
1983	*	Work on the mechanism of electron transfer reactions, especially in metal complexes.	Henry Taube
1984	**	Development of methodology for chemical synthesis on a solid matrix.	Robert Bruce Merrifield
1985	*	Outstanding achievements in the development of direct methods for the determination of crystal structures.	Herbert A. Hauptman; Jerome Karle
1986	*	Contributions concerning the dynamics of chemical elementary processes.	Dudley R. Herschbach; Yuan T. Lee; John C. Polanyi

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 1-1.
Nobel Prize awards: 1950–99

Year	NSF Funding	Effort for which Nobel Prize awarded:	Laureate(s)
		Chemistry, continued	
1987	*	Development and use of molecules with structure-specific interactions of high selectivity.	Donald J. Cram; Jean-Marie Lehn; Charles J. Pedersen
1988		The determination of the three-dimensional structure of a photosynthetic reaction center.	Johann Deisenhofer; Robert Huber; Hartmut Michel
1989	*	Discovery of catalytic properties of RNA.	Sidney Altman; Thomas R. Cech
1990	*	Development of the theory and methodology of organic synthesis.	Elias James Corey
1991		Contributions to the development of the methodology of high resolution nuclear magnetic resonance (NMR) spectroscopy.	Richard R. Ernst
1992	*	Contributions to the theory of electron transfer reactions in chemical systems.	Rudolph A. Marcus
1993		Contributions to the developments of methods within DNA-based chemistry: invention of the polymerase chain reaction (PCR) method; and fundamental contributions to the establishment of oligonucleiotide-based, site-directed mutagenesis and its development for the protein studies.	Kary B. Mullis; Michael Smith
1994	*	Contribution to carbocation chemistry.	George A. Olah
1995	*	Work in atmospheric chemistry, particularly concerning the formation and decomposition of ozone.	Paul J. Crutzen; Mario J. Molina; F. Sherwood Rowland
1996	*	Discovery of fullerenes.	Robert F. Curl, Jr.; Sir Harold W. Kroto; Richard E. Smalley
1997	*	Elucidation of the enzymatic mechanism underlying the synthesis of adenosine triphosphate (ATP); and for the first discovery of an ion-transporting enzyme, Na+,K+-ATPase.	Paul D. Boyer; John E. Walker; Jens C. Skou
1998		Development of the density-functional theory; and development of computational methods in quantum chemistry.	Walter Kohn; John A. Pople
1999	*	Studies of the transition states of chemical reactions using femtosecond spectroscopy.	Ahmed H. Zewail

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 1-1.
Nobel Prize awards: 1950–99

Year	NSF Funding	Effort for which Nobel Prize awarded:	Laureate(s)
		Physiology or medicine	
1950		Discoveries relating to the hormones of the adrenal cortex, their structure and biological effects.	Edward Calvin Kendall; Tadeus Reichstein; Philip Showalter Hench
1951		Discoveries concerning yellow fever and how to combat it.	Max Theiler
1952		Discovery of streptomycin, the first antibiotic effective against tuberculosis.	Selman Abraham Waksman
1953		Discovery of the citric acid cycle; and discovery of co-enzyme A and its importance for intermediary metabolism.	Sir Hans Adolf Krebs; Fritz Albert Lipmann
1954		Discovery of the ability of poliomyelitis viruses to grow in cultures of various type of tissue.	John Franklin Enders; Thomas Huckle Weller; Frederick Chapman Robbins
1955		Discoveries concerning the nature and mode of action of oxidation enzymes.	Axel Hugo Theodor Theorell
1956		Discoveries concerning heart catheterization and pathological changes in the circulatory system.	André Frédéric Cournand; Werner Forssmann; Dickinson W. Richards
1957		Discoveries relating to synthetic compounds that inhibit the action of certain body substances, and especially their action on the vascular system and the skeletal muscles.	Daniel Bovet
1958		Discovery that genes act by regulating definite chemical events; and discoveries concerning genetic recombination and the organization of the genetic material of bacteria.	George Wells Beadle; Edward Lawrie Tatum; Joshua Lederberg
1959		Discovery of the mechanism in the biological synthesis of ribonucleic acid and deoxyribonucleic acid.	Severo Ochoa; Arthur Kornberg
1960		Discovery of acquired immunological tolerance.	Sir Frank MacFarlane Burnet; Sir Peter Brian Medawar
1961		Discoveries of the physical mechanism of stimulation within the cochlea.	Georg Von Békésy
1962		Discoveries concerning the molecular structure of nuclear acids and its significance for information transfer in living material.	Francis Harry Compton Crick; James Dewey Watson; Maurice Hugh Frederick Wilkins
1963		Discoveries concerning the ionic mechanisms involved in excitation and inhibition in the peripheral and central portions of the nerve cell membrane.	Sir John Carew Eccles; Sir Alan Lloyd Hodgkin; Sir Andrew Fielding Huxley
1964	**	Discoveries concerning the mechanism and regulation of the cholesterol and fatty acid metabolism.	Konrad Bloch; Feodor Lynen
1965		Discoveries concerning genetic control of enzyme and virus synthesis.	François Jacob; André Lwoff; Jacques Monod

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 1-1.
Nobel Prize awards: 1950–99

Year	NSF Funding	Effort for which Nobel Prize awarded:	Laureate(s)
		Physiology or medicine, continued	
1966		Discovery of tumor-inducing viruses; and discoveries concerning hormonal treatment of prostatic cancer.	Peyton Rous; Charles Brenton Huggins
1967		Discoveries concerning the primary physiological and chemical visual processes in the eye.	Ragnar Granit; Haldan Keffer Hartline; George Wald
1968		Interpretation of the genetic code and its function in protein synthesis.	Robert W. Holley; Har Gobind Khorana; Marshall W. Nirenberg
1969	**	Discoveries concerning the replication mechanism and the genetic structure of viruses.	Max Delbrück; Alfred D. Hershey; Salvador E. Luria
1970		Discoveries concerning the humoral transmittors in the nerve terminals and the mechanism for their storage, release, and inactivation.	Sir Bernard Katz; Ulf VonEuler; Julius Axelrod
1971		Discoveries concerning the mechanisms of the action of hormones.	Earl W. Sutherland, Jr.
1972	*	Discoveries concerning the chemical structure of antibodies.	Gerald M. Edelman; Rodney R. Porter
1973		Discoveries concerning organization and elicitation of individual and social behavior patterns.	Karl Von Frisch; Konrad Lorenz; Nikolaas Tinbergen
1974	**	Discoveries concerning the structural and functional organization of the cell.	Albert Claude; Christian deDuve; George E. Palade
1975	*	Discoveries concerning the interaction between tumor viruses and the genetic material of the cell.	David Baltimore; Renato Dulbecco; Howard Martin Temin
1976	*	Discoveries concerning new mechanisms for the origin and dissemination of infectious diseases.	Baruch S. Blumberg; D. Carleton Gajdusek
1977		Discoveries concerning the peptide hormone production of the brain; and the development of radioimmunoassays of peptide hormones.	Roger Guillemin; Andrew V. Schally; Rosalyn Yalow
1978	*	Discovery of restriction enzymes and their application to problems of molecular genetics.	Werner Arber; Daniel Nathans; Hamilton O. Smith
1979	**	Development of computer-assisted tomography.	Allan M. Cormack; Sir Godfrey N. Hounsfield
1980		Discoveries concerning genetically determined structures on the cell surface that regulate immunological reactions.	Baruj Benacerraf; Jean Dausset; George D. Snell
1981	**	Discoveries concerning the functional specialization of the cerebral hemispheres; and discoveries concerning information processing in the visual system.	Roger W. Sperry; David H. Hubel; Torsten N. Wiesel

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 1-1.
Nobel Prize awards: 1950–99

Year	NSF Funding	Effort for which Nobel Prize awarded:	Laureate(s)
		Physiology or medicine, continued	
1982		Discoveries concerning prostaglandins and related biologically active substances.	Sune K. Bergström; Bengt I. Samuelsson; Sir John R. Vane
1983		Discovery of mobile genetic elements.	Barbara McClintock
1984		Theories concerning the specificity in development and control of the immune system and the discovery of the principle for production of monoclonal antibodies.	Niels K. Jerne; Georges J.F. Köhler; César Milstein
1985		Discoveries concerning the regulation of cholesterol metabolism.	Michael S. Brown; Joseph L. Goldstein
1986		Discoveries of growth factors.	Stanley Cohen; Rita Levi-Montalcini
1987		Discovery of the genetic principle for generation of antibody diversity.	Susumu Tonegawa
1988		Discoveries of important principles for drug treatment.	Sir James W. Black; Gertrude B. Elion; George H. Hitchings
1989		Discovery of the cellular origin of retroviral oncogenes.	J. Michael Bishop; Harold E. Varmus
1990		Discoveries concerning organ and cell transplantation in the treatment of human disease.	Joseph E. Murray; E. Donnall Thomas
1991		Discoveries concerning the function of single ion channels in cells.	Erwin Neher; Bert Sakmann
1992	*	Discoveries concerning reversible protein phosphorylation as a biological regulatory mechanism.	Edmond H. Fischer; Edwin G. Krebs
1993	*	Discoveries of split genes.	Richard J. Roberts; Phillip A. Sharp
1994	*	Discovery of G-proteins and the role of these proteins in signal transduction in cells.	Alfred G. Gilman; Martin Rodbell
1995	*	Discoveries concerning the genetic control of early embryonic development.	Edward B. Lewis; Christiane Nüsslein-Volhard; Eric F. Wieschaus
1996		Discoveries concerning the specificity of the cell-mediated immune defense.	Peter C. Doherty; Rolf M. Zinkernagel
1997	*	Discovery of prions - a new biological principle of infection.	Stanley B. Prusiner
1998		Discoveries concerning nitric oxide as a signaling molecule in the cardiovascular system.	Robert F. Furchgott; Louis J. Ignarro; Ferid Murad
1999		Discovery that proteins have intrinsic signals that govern their transport and localization in the cell.	Günter Blobel

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 1-1.
Nobel Prize awards: 1950–99

Year	NSF Funding	Effort for which Nobel Prize awarded:	Laureate(s)
		Economics	
1969		Development and application of dynamic models for the analysis of economic processes.	Ragnar Frisch; Jan Tinbergen
1970	**	Scientific work through which he has developed static and dynamic economic theory and actively contributed to raising the level of analysis in economic science.	Paul A. Samuelson
1971		Empirically founded interpretation of economic growth which has led to new and deepened insight into the economic and social structure and process of development.	Simon Kuznets
1972	**	Pioneering contributions to general economic equilibrium theory and welfare theory.	Sir John R. Hicks; Kenneth J. Arrow
1973	*	Development of the input- output method and for its application to important economic problems.	Wassily Leontief
1974		Pioneering work in the theory of money and economic fluctuations and penetrating analysis of the interdependence of economic, social, and institutional phenomena.	Gunnar Myrdal; Friedrich August VonHayek
1975	*	Contributions to the theory of optimum allocation of resources.	Leonid Vitaliyevich Kantorovich; Tjalling C. Koopmans
1976		Achievements in the fields of consumption analysis, monetary history and theory and for the demonstration of the complexity of stabilization policy.	Milton Friedman
1977		Pathbreaking contribution to the theory of international trade and international capital movements.	Bertil Ohlin; James E. Meade
1978	*	Pioneering research into the decision-making process within economic organizations.	Herbert A. Simon
1979		Pioneering research into economic development research with particular consideration of the problems of developing countries.	Theodore W. Schultz; Sir Arthur Lewis
1980	*	Creation of econometric models and the application to the analysis of economic fluctuations and economic policies.	Lawrence R. Klein
1981	*	Analysis of financial markets and their relations to expenditure decisions, employment, production, and prices.	James Tobin
1982		Seminal studies of industrial structures, function of markets, and causes and effects of public regulation.	George J. Stigler
1983	*	Incorporating new analytical methods into economic theory and rigorous reformulation of the theory of general equilibrium.	Gerard Debreu
1984		Fundamental contributions to the development of systems of national accounts and hence great improvment in the basis for empirical economic analysis.	Sir Richard Stone
1985	*	Pioneering analyses of saving and of financial markets.	Franco Modigliani
1986	*	Development of the contractual and constitutional bases for the theory of economic and political decision-making.	James M. Buchanan, Jr.
1987		Contributions to the theory of economic growth.	Robert M. Solow

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 1-1.
Nobel Prize awards: 1950–99

Year	NSF Funding	Effort for which Nobel Prize awarded:	Laureate(s)
		Economics, continued	
1988		Pioneering contributions to the theory of markets and efficient utilization of resources.	Maurice Allais
1989		Clarification of the probability theory foundations of econometrics and analyses of simultaneous economic structures.	Trygve Haavelmo
1990	*	Pioneering work in the theory of financial economics.	Harry M. Markowitz; Merton H. Miller; William F. Sharpe
1991		Discovery and clarification of the significance of transaction costs and property rights for the institutional structure and functioning of the economy.	Ronald H. Coase
1992		Extension of the domain of microeconomic analysis to a wide range of human behavior and interaction, including nonmarket behavior.	Gary S. Becker
1993	*	Renewal of research in economic history by applying economic theory and quantitative methods in order to explain economic and institutional change.	Robert W. Fogel; Douglass C. North
1994	*	Pioneering analysis of equilibria in the theory of noncooperative games.	John C. Harsanyi; John F. Nash; Reinhard Selten
1995	*	Development and application of the hypothesis of rational expectations, which have transformed macroeconomic analysis and deepened understanding of economic policy.	Robert E. Lucas, Jr.
1996		Fundamental contributions to the economic theory of incentives under asymmetric information.	James A. Mirrlees; William Vickrey
1997	*	New method to determine the value of derivatives.	Robert C. Merton; Myron S. Scholes
1998		Contributions to welfare economics.	Amartya Sen
1999		Analysis of monetary and fiscal policy under different exchange rate regimes and analysis of optimum currency areas.	Robert A. Mundell

* = Funded by NSF before receiving Nobel Prize; ** = Funded by NSF after receiving Nobel Prize

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS) and Office of Legislative and Public Affairs (NSF/OLPA), unpublished tabulations, 1999, and «http://www.nobel.se/enm-index.html»

See page 1-29 in Volume 1.

Appendix table 2-1.
Gross domestic product and GDP implicit price deflators: 1940–2004

Year	Gross domestic product (Billions of dollars)		GDP price deflator (1992 = 100.00)	
	Calendar year	Fiscal year	Calendar year	Fiscal year
1940	101.2	96.5	10.75	10.75
1941	126.7	113.9	11.50	11.23
1942	161.6	144.2	12.35	12.04
1943	198.3	180.0	13.02	12.79
1944	219.7	209.0	13.36	13.28
1945	223.2	221.4	13.72	13.63
1946	222.6	222.9	15.37	14.59
1947	244.6	234.9	17.10	16.34
1948	269.7	256.6	18.09	17.66
1949	267.8	271.7	18.09	18.40
1950	294.6	273.6	18.28	18.10
1951	339.7	321.3	19.59	19.17
1952	358.6	348.9	19.93	19.86
1953	379.7	373.1	20.18	20.23
1954	381.3	378.0	20.41	20.44
1955	415.1	395.3	20.74	20.65
1956	438.0	427.6	21.47	21.22
1957	461.0	450.5	22.18	22.01
1958	467.3	460.6	22.71	22.58
1959	507.2	491.8	22.95	23.02
1960	526.6	518.2	23.27	23.23
1961	544.8	530.9	23.54	23.57
1962	585.2	567.5	23.84	23.84
1963	617.4	598.3	24.12	24.12
1964	663.0	640.0	24.48	24.45
1965	719.1	686.7	24.96	24.86
1966	787.8	752.8	25.67	25.43
1967	833.6	811.9	26.49	26.23
1968	910.6	868.1	27.64	27.23
1969	982.2	947.9	28.94	28.43
1970	1,035.6	1,009.0	30.48	29.93
1971	1,125.4	1,077.7	32.06	31.47
1972	1,237.3	1,176.9	33.42	32.97
1973	1,382.6	1,306.8	35.30	34.42
1974	1,496.9	1,438.1	38.47	36.91
1975	1,630.6	1,554.5	42.09	40.71
1976	1,819.0	1,730.4	44.55	43.65
1977	2,026.9	1,971.4	47.43	46.97
1978	2,291.4	2,212.6	50.89	50.28
1979	2,557.5	2,495.9	55.23	54.44
1980	2,784.2	2,718.9	60.33	59.28
1981	3,115.9	3,049.1	66.01	65.12
1982	3,242.1	3,211.3	70.17	69.72
1983	3,514.5	3,421.9	73.16	72.94
1984	3,902.4	3,812.0	75.92	75.76
1985	4,180.7	4,102.1	78.53	78.37
1986	4,422.2	4,374.3	80.58	80.60
1987	4,692.3	4,605.1	83.06	82.93
1988	5,049.6	4,953.5	86.09	85.81
1989	5,438.7	5,351.8	89.72	89.44
1990	5,743.8	5,684.5	93.60	93.15
1991	5,916.7	5,858.8	97.32	97.15
1992	6,244.4	6,143.2	100.00	100.00
1993	6,558.1	6,475.1	102.64	102.64
1994	6,947.0	6,845.7	105.09	105.12
1995	7,269.6	7,197.7	107.51	107.65
1996	7,661.6	7,549.2	109.53	109.76
1997	8,110.9	7,996.5	111.57	111.83

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-1.
Gross domestic product and GDP implicit price deflators: 1940–2004

Year	Gross domestic product (Billions of dollars)		GDP price deflator (1992 = 100.00)	
	Calendar year	Fiscal year	Calendar year	Fiscal year
1998	8,508.9	8,404.5	112.70	113.17
1999 projected	8,849.3	8,747.9	114.44	114.64
2000 projected	9,212.1	9,105.8	116.83	116.93
2001 projected	9,599.0	9,485.3	119.32	119.39
2002 projected	10,021.3	9,893.6	121.84	121.90
2003 projected	10,472.3	10,340.0	124.38	124.46
2004 projected	10,943.6	10,810.4	126.99	127.07

SOURCES: Fiscal year GDP and deflators are from the Office of Management and Budget, FY 2000 Budget of the United States. Calendar year GDP and deflators for 1940–98 are from the Bureau of Economic Analysis. Calendar year GDP and deflators projected in 1999–2004 are based on economic assumptions provided in the FY 2000 Budget of the United States.

See figure 2-1 in Volume I.

Appendix table 2-2.
Purchasing power parity and market exchange rates, by selected country: 1981–99
(Units of foreign currency per U.S. dollar)

	Purchasing power parities						Market exchange rates	
Year	Canada	France	Germany	Italy	Japan	United Kingdom	Germany	Japan
1981	1.27	5.70	2.41	891	241	0.53	2.26	221
1982	1.31	6.02	2.36	984	232	0.54	2.43	249
1983	1.31	6.32	2.33	1,084	226	0.54	2.55	238
1984	1.30	6.49	2.27	1,156	221	0.54	2.85	238
1985	1.28	6.64	2.23	1,217	218	0.55	2.94	239
1986	1.29	6.82	2.24	1,281	217	0.55	2.17	169
1987	1.31	6.80	2.20	1,316	210	0.56	1.80	145
1988	1.31	6.75	2.15	1,353	204	0.58	1.76	128
1989	1.32	6.69	2.11	1,378	199	0.59	1.88	138
1990	1.30	6.61	2.09	1,421	195	0.60	1.62	145
1991	1.29	6.51	2.09	1,463	193	0.64	1.66	135
1992	1.28	6.42	2.07	1,459	188	0.62	1.56	127
1993	1.26	6.57	2.10	1,534	184	0.64	1.65	111
1994	1.25	6.62	2.07	1,533	181	0.65	1.62	102
1995	1.19	6.49	2.02	1,556	169	0.66	1.43	94
1996	1.19	6.57	2.03	1,583	166	0.64	1.50	109
1997	1.17	6.52	2.00	1,595	164	0.65	1.73	121
1998	1.16	6.51	2.01	1,621	163	0.66	NA	NA
1999	1.16	6.50	2.01	1,632	160	0.67	NA	NA

NA = not available

SOURCES: Organisation for Economic Co–operation and Development, Main Science and Technology Indicators database (Paris: April, 1999); and International Monetary Fund, *International Financial Statistics Yearbook* (Washington, DC: 1998).

Appendix table 2-3.
U.S. R&D expenditures, by performing sector and source of funds: 1953–98
(Millions of current dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. Govt.	Industry	U&C	Federal Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Non-profit	Federal Govt.[a]
Calendar year[d]																		
1953	5,160	1,015	3,630	1,430	2,200		273	149	40	21	37	27	131	112	58	26	28	
1954	5,621	963	4,070	1,750	2,320		301	165	45	24	40	29	161	127	65	31	31	
1955	6,281	973	4,517	2,057	2,460	123	342	191	50	27	42	32	187	131	64	35	32	9
1956	8,500	1,130	6,272	2,995	3,277	333	391	221	57	32	46	36	217	146	71	37	38	11
1957	9,908	1,297	7,324	3,928	3,396	407	433	242	64	37	51	40	267	167	79	37	51	14
1958	10,915	1,507	8,066	4,436	3,630	323	491	280	72	39	56	45	316	195	95	38	62	18
1959	12,490	1,681	9,200	5,217	3,983	418	586	356	81	40	61	50	349	234	125	42	67	22
1960	13,711	1,801	10,032	5,604	4,428	477	705	453	90	40	67	55	385	264	148	48	68	48
1961	14,564	1,987	10,353	5,685	4,668	555	834	557	101	40	75	62	440	304	169	49	86	92
1962	15,636	2,188	11,037	6,008	5,029	426	993	687	112	41	84	70	500	363	200	54	109	130
1963	17,519	2,558	12,216	6,856	5,360	414	1,178	839	125	41	96	78	580	408	234	55	119	165
1964	19,103	2,965	13,049	7,257	5,792	463	1,375	995	138	41	114	88	629	417	250	55	112	205
1965	20,252	3,156	13,812	7,367	6,445	373	1,595	1,167	150	42	136	101	630	472	286	62	124	215
1966	22,072	3,308	15,193	7,977	7,216	355	1,818	1,335	160	45	165	114	652	537	329	70	138	210
1967	23,346	3,444	15,966	7,946	8,020	419	2,035	1,491	168	52	200	126	696	561	342	74	145	225
1968	24,666	3,497	17,014	8,145	8,869	415	2,187	1,586	185	58	221	139	722	596	364	81	151	235
1969	25,996	3,790	17,844	7,987	9,857	464	2,280	1,624	208	61	233	155	731	642	388	93	161	245
1970	26,271	4,154	17,594	7,306	10,288	473	2,418	1,686	237	66	259	171	727	677	410	95	172	230
1971	26,952	4,409	17,829	7,175	10,654	491	2,565	1,760	262	72	290	182	735	709	427	98	184	215
1972	28,740	4,676	19,004	7,469	11,535	548	2,757	1,890	282	79	312	195	785	771	472	101	198	200
1973	30,952	4,837	20,704	7,600	13,104	545	2,953	2,009	302	90	343	211	841	882	566	105	211	190
1974	33,365	5,132	22,239	7,572	14,667	648	3,216	2,160	320	104	393	239	926	995	639	115	241	210
1975	35,686	5,561	23,460	7,878	15,582	727	3,570	2,400	348	118	432	272	1,067	1,076	675	125	276	225
1976	39,458	5,890	26,107	8,671	17,436	890	3,899	2,619	369	131	480	300	1,266	1,162	711	135	316	245
1977	43,456	6,211	28,863	9,523	19,340	962	4,346	2,893	394	155	569	337	1,551	1,248	740	150	358	275
1978	48,822	6,962	32,222	10,107	22,115	1,082	4,996	3,329	443	182	679	364	1,826	1,402	830	165	407	333
1979	55,521	7,471	37,062	11,354	25,708	1,164	5,715	3,848	482	215	785	386	2,091	1,629	985	180	464	390
1980	63,332	7,831	43,228	12,752	30,476	1,277	6,455	4,335	519	264	920	419	2,366	1,700	1,000	200	500	475
1981	72,307	8,605	50,425	14,997	35,428	1,385	7,085	4,670	581	314	1,058	463	2,483	1,788	1,038	225	525	538
1982	80,837	9,501	57,166	17,061	40,105	1,484	7,603	4,879	621	363	1,207	534	2,608	1,950	1,175	250	525	525
1983	90,030	10,830	63,683	19,095	44,588	1,585	8,251	5,210	658	432	1,357	595	2,944	2,138	1,313	275	550	600
1984	102,308	11,916	73,061	21,657	51,404	1,739	9,154	5,748	721	518	1,514	654	3,337	2,478	1,550	323	605	625
1985	114,747	13,093	82,376	25,333	57,043	1,863	10,308	6,388	834	630	1,743	713	3,709	2,736	1,700	376	660	663
1986	120,297	13,504	85,932	26,000	59,932	1,891	11,540	7,028	969	745	2,019	780	4,051	2,842	1,700	420	722	538
1987	126,255	13,588	90,160	28,757	61,403	1,995	12,807	7,768	1,065	831	2,262	882	4,369	2,834	1,569	449	816	501
1988	133,903	14,342	94,893	28,221	66,672	2,122	14,219	8,592	1,165	934	2,527	1,003	4,631	3,187	1,762	496	928	510
1989	141,909	15,231	99,860	26,359	73,501	2,195	15,631	9,314	1,274	1,062	2,852	1,131	4,781	3,664	2,062	556	1,046	547

Appendix table 2-3.
U.S. R&D expenditures, by performing sector and source of funds: 1953–98
(Millions of current dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. Govt.	Industry	U&C	Federal Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Non-profit	Federal Govt.[a]
Calendar year[d]																		
1990	152,039	15,671	107,404	25,802	81,602	2,323	16,935	9,935	1,399	1,167	3,186	1,249	4,955	4,115	2,345	614	1,156	636
1991	160,863	15,249	114,675	24,095	90,580	2,277	18,201	10,662	1,482	1,243	3,457	1,358	5,163	4,603	2,679	668	1,256	696
1992	165,211	15,853	116,757	22,369	94,388	2,353	19,383	11,523	1,524	1,321	3,568	1,448	5,271	4,847	2,806	703	1,339	748
1993	165,442	16,532	115,435	20,844	94,591	1,965	20,499	12,311	1,550	1,388	3,719	1,533	5,283	4,978	2,839	721	1,418	749
1994	168,854	16,432	117,392	20,261	97,131	2,202	21,626	13,009	1,611	1,448	3,960	1,598	5,317	5,125	2,900	747	1,478	759
1995	183,232	17,133	129,830	21,178	108,652	2,273	22,647	13,604	1,741	1,539	4,139	1,624	5,372	5,165	2,848	814	1,502	812
1996	196,540	16,627	142,371	21,356	121,015	2,297	23,720	14,180	1,839	1,655	4,375	1,672	5,410	5,343	2,906	891	1,546	771
1997	211,268	16,814	155,409	21,798	133,611	2,130	25,001	14,849	1,940	1,773	4,686	1,754	5,466	5,628	3,036	969	1,623	820
1998 .. prelim.	227,173	17,189	168,922	22,216	146,706	2,373	26,343	15,558	2,070	1,896	4,979	1,840	5,517	6,006	3,254	1,051	1,702	823

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]For 1953–54, expenditures of industry FFRDCs were not separated out from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those two years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–54.

[b]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See page 1-33; figures 2-2, 2-11, and 2-12; text table 2-1; and figures 6-1 and 6-2 in Volume I.

Appendix table 2-4.
U.S. R&D expenditures, by performing sector and source of funds: 1953–98
(Millions of constant 1992 dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. Govt.	Industry	U&C	Federal Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Non-profit	Federal Govt.[a]
Calendar year[d]																		
1953	25,570	5,030	17,988	7,086	10,902		1,350	738	196	102	181	134	649	553	285	129	139	
1954	27,538	4,716	19,941	8,574	11,367		1,475	806	218	115	194	142	786	620	316	152	152	
1955	30,286	4,690	21,779	9,918	11,861	593	1,649	921	241	130	203	154	902	632	309	169	154	41
1956	39,590	5,265	29,213	13,950	15,263	1,551	1,821	1,029	263	147	214	168	1,011	678	328	172	177	51
1957	44,672	5,849	33,021	17,710	15,311	1,835	1,952	1,089	289	165	230	180	1,202	751	354	167	230	63
1958	48,063	6,634	35,517	19,533	15,984	1,422	2,162	1,233	317	172	244	196	1,389	859	418	167	273	79
1959	54,421	7,325	40,087	22,732	17,355	1,821	2,553	1,549	351	172	266	216	1,521	1,017	542	183	292	96
1960	58,922	7,738	43,111	24,083	19,029	2,050	3,028	1,945	387	172	288	236	1,654	1,135	636	206	292	206
1961	61,870	8,442	43,980	24,150	19,830	2,358	3,541	2,364	427	170	316	263	1,869	1,291	718	208	365	389
1962	65,588	9,176	46,296	25,201	21,095	1,787	4,163	2,880	470	170	352	292	2,097	1,523	839	227	457	545
1963	72,633	10,607	50,647	28,425	22,222	1,716	4,884	3,476	518	168	398	323	2,403	1,692	970	228	493	684
1964	78,034	12,113	53,305	29,645	23,660	1,891	5,615	4,065	562	165	464	359	2,569	1,703	1,021	225	458	837
1965	81,138	12,645	55,337	29,515	25,821	1,494	6,388	4,675	599	166	545	403	2,522	1,891	1,146	248	497	861
1966	85,982	12,885	59,186	31,075	28,111	1,383	7,082	5,201	623	175	641	442	2,538	2,090	1,280	273	538	818
1967	88,133	13,003	60,272	29,996	30,276	1,582	7,682	5,627	634	194	753	474	2,627	2,118	1,291	279	547	849
1968	89,241	12,653	61,556	29,468	32,088	1,501	7,912	5,738	668	208	798	501	2,612	2,156	1,317	293	546	850
1969	89,826	13,097	61,659	27,598	34,060	1,603	7,878	5,610	719	209	805	536	2,526	2,217	1,339	321	556	847
1970	86,192	13,628	57,723	23,970	33,753	1,552	7,931	5,530	778	215	848	561	2,384	2,219	1,344	312	564	755
1971	84,067	13,752	55,611	22,380	33,231	1,532	8,001	5,488	817	225	903	568	2,291	2,210	1,330	306	574	671
1972	85,997	13,991	56,864	22,349	34,515	1,640	8,250	5,655	844	236	932	582	2,349	2,306	1,411	302	592	598
1973	87,681	13,701	58,652	21,530	37,122	1,544	8,365	5,690	854	254	972	596	2,382	2,499	1,603	297	598	538
1974	86,731	13,341	57,809	19,683	38,126	1,684	8,358	5,615	832	270	1,020	621	2,407	2,585	1,660	299	626	546
1975	84,785	13,213	55,738	18,717	37,021	1,727	8,481	5,702	827	280	1,025	646	2,535	2,556	1,604	297	656	535
1976	88,571	13,222	58,602	19,464	39,138	1,998	8,751	5,879	828	294	1,077	672	2,841	2,608	1,596	303	709	550
1977	91,622	13,096	60,854	20,078	40,776	2,028	9,163	6,098	831	326	1,199	709	3,269	2,632	1,561	316	755	580
1978	95,937	13,681	63,317	19,860	43,456	2,126	9,816	6,541	871	357	1,334	714	3,588	2,755	1,631	324	800	653
1979	100,527	13,527	67,105	20,558	46,547	2,108	10,347	6,967	872	388	1,421	698	3,785	2,949	1,783	326	840	706
1980	104,975	12,980	71,653	21,137	50,515	2,117	10,699	7,185	859	437	1,524	695	3,922	2,818	1,658	332	829	787
1981	109,540	13,035	76,390	22,719	53,671	2,098	10,733	7,074	880	476	1,602	701	3,761	2,708	1,572	341	795	814
1982	115,201	13,540	81,468	24,314	57,154	2,115	10,834	6,952	885	517	1,719	760	3,717	2,779	1,675	356	748	748
1983	123,058	14,803	87,046	26,100	60,946	2,166	11,278	7,121	899	590	1,854	813	4,023	2,922	1,794	376	752	820
1984	134,758	15,695	96,234	28,526	67,708	2,291	12,057	7,570	950	682	1,994	861	4,395	3,264	2,042	426	796	823
1985	146,118	16,672	104,897	32,259	72,638	2,372	13,126	8,134	1,061	802	2,220	908	4,723	3,484	2,165	479	840	844
1986	149,289	16,759	106,642	32,266	74,376	2,347	14,321	8,721	1,203	925	2,505	968	5,027	3,526	2,110	521	896	667
1987	152,004	16,360	108,548	34,622	73,926	2,402	15,419	9,352	1,282	1,000	2,723	1,061	5,259	3,412	1,889	541	982	604
1988	155,538	16,659	110,225	32,781	77,445	2,465	16,516	9,980	1,353	1,084	2,935	1,165	5,379	3,702	2,047	577	1,078	592
1989	158,168	16,976	111,302	29,379	81,923	2,447	17,422	10,381	1,419	1,183	3,178	1,261	5,329	4,084	2,298	619	1,166	610

Appendix table 2-4.
U.S. R&D expenditures, by performing sector and source of funds: 1953–98
(Millions of constant 1992 dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. Govt.	Industry	U&C	Federal Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Non-profit	Federal Govt.[a]
Calendar year[d]																		
1990	162,435	16,743	114,748	27,566	87,182	2,482	18,093	10,614	1,494	1,246	3,404	1,334	5,294	4,396	2,506	656	1,235	680
1991	165,293	15,669	117,833	24,759	93,074	2,340	18,702	10,956	1,522	1,277	3,552	1,395	5,305	4,730	2,753	686	1,291	715
1992	165,211	15,853	116,757	22,369	94,388	2,353	19,383	11,523	1,524	1,321	3,568	1,448	5,271	4,847	2,806	703	1,339	748
1993	161,186	16,107	112,466	20,308	92,158	1,914	19,972	11,994	1,510	1,352	3,623	1,493	5,147	4,850	2,766	703	1,381	730
1994	160,676	15,637	111,706	19,280	92,426	2,095	20,579	12,379	1,533	1,378	3,768	1,521	5,059	4,877	2,760	710	1,407	723
1995	170,432	15,937	120,761	19,699	101,062	2,114	21,065	12,654	1,619	1,431	3,850	1,511	4,996	4,804	2,649	757	1,397	755
1996	179,439	15,181	129,984	19,498	110,486	2,097	21,656	12,946	1,679	1,511	3,994	1,526	4,939	4,878	2,653	814	1,412	704
1997	189,359	15,071	139,293	19,538	119,755	1,909	22,408	13,309	1,739	1,589	4,200	1,572	4,899	5,044	2,721	869	1,454	735
1998 .. prelim.	201,573	15,252	149,886	19,713	130,174	2,106	23,374	13,805	1,837	1,682	4,418	1,632	4,895	5,330	2,887	932	1,510	731

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]For 1953–54, expenditures of industry FFRDCs were not separated out from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those two years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–54.

[b]Industry sources of industry R&D expenditures include all nonfederal sources of industry R&D expenditures.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See page 1-33 and figure 2-12 in Volume I.

Appendix table 2-5.
U.S. R&D expenditures, by source of funds and performer: 1953–98
(Millions of current dollars)

Funding sector:	Total U.S	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Nonprofit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1953	5,160	2,783	1,015	1,430		149	131	58		2,247	2,200	21	26	37	55	28	27	40
1954	5,621	3,102	963	1,750		165	161	65		2,375	2,320	24	31	40	60	31	29	45
1955	6,281	3,603	973	2,057	123	191	187	64	9	2,522	2,460	27	35	42	64	32	32	50
1956	8,500	4,978	1,130	2,995	333	221	217	71	11	3,346	3,277	32	37	46	74	38	36	57
1957	9,908	6,233	1,297	3,928	407	242	267	79	14	3,470	3,396	37	37	51	91	51	40	64
1958	10,915	6,974	1,507	4,436	323	280	316	95	18	3,707	3,630	39	38	56	107	62	45	72
1959	12,490	8,167	1,681	5,217	418	356	349	125	22	4,065	3,983	40	42	61	117	67	50	81
1960	13,711	8,915	1,801	5,604	477	453	385	148	48	4,516	4,428	40	48	67	123	68	55	90
1961	14,564	9,484	1,987	5,685	555	557	440	169	92	4,757	4,668	40	49	75	148	86	62	101
1962	15,636	10,138	2,188	6,008	426	687	500	200	130	5,124	5,029	41	54	84	179	109	70	112
1963	17,519	11,645	2,558	6,856	414	839	580	234	165	5,456	5,360	41	55	96	197	119	78	125
1964	19,103	12,764	2,965	7,257	463	995	629	250	205	5,888	5,792	41	55	114	200	112	88	138
1965	20,252	13,194	3,156	7,367	373	1,167	630	286	215	6,549	6,445	42	62	136	225	124	101	150
1966	22,072	14,165	3,308	7,977	355	1,335	652	329	210	7,331	7,216	45	70	165	252	138	114	160
1967	23,346	14,563	3,444	7,946	419	1,491	696	342	225	8,146	8,020	52	74	200	271	145	126	168
1968	24,666	14,964	3,497	8,145	415	1,586	722	364	235	9,008	8,869	58	81	221	290	151	139	185
1969	25,996	15,228	3,790	7,987	464	1,624	731	388	245	10,011	9,857	61	93	233	316	161	155	208
1970	26,271	14,984	4,154	7,306	473	1,686	727	410	230	10,449	10,288	66	95	259	343	172	171	237
1971	26,952	15,210	4,409	7,175	491	1,760	735	427	215	10,824	10,654	72	98	290	366	184	182	262
1972	28,740	16,039	4,676	7,469	548	1,890	785	472	200	11,715	11,535	79	101	312	393	198	195	282
1973	30,952	16,587	4,837	7,600	545	2,009	841	566	190	13,299	13,104	90	105	343	422	211	211	302
1974	33,365	17,287	5,132	7,572	648	2,160	926	639	210	14,886	14,667	104	115	393	480	241	239	320
1975	35,686	18,533	5,561	7,878	727	2,400	1,067	675	225	15,825	15,582	118	125	432	548	276	272	348
1976	39,458	20,292	5,890	8,671	890	2,619	1,266	711	245	17,702	17,436	131	135	480	616	316	300	369
1977	43,456	22,155	6,211	9,523	962	2,893	1,551	740	275	19,645	19,340	155	150	569	695	358	337	394
1978	48,822	24,468	6,962	10,107	1,082	3,329	1,826	830	333	22,462	22,115	182	165	679	771	407	364	443
1979	55,521	27,303	7,471	11,354	1,164	3,848	2,091	985	390	26,103	25,708	215	180	785	850	464	386	482
1980	63,332	30,035	7,831	12,752	1,277	4,335	2,366	1,000	475	30,940	30,476	264	200	920	919	500	419	519
1981	72,307	33,714	8,605	14,997	1,385	4,670	2,483	1,038	538	35,967	35,428	314	225	1,058	988	525	463	581
1982	80,837	37,233	9,501	17,061	1,484	4,879	2,608	1,175	525	40,718	40,105	363	250	1,207	1,059	525	534	621
1983	90,030	41,576	10,830	19,095	1,585	5,210	2,944	1,313	600	45,295	44,588	432	275	1,357	1,145	550	595	658
1984	102,308	46,571	11,916	21,657	1,739	5,748	3,337	1,550	625	52,245	51,404	518	323	1,514	1,258	605	654	721
1985	114,747	52,748	13,093	25,333	1,863	6,388	3,709	1,700	663	58,049	57,043	630	376	1,743	1,373	660	713	834
1986	120,297	54,711	13,504	26,000	1,891	7,028	4,051	1,700	538	61,097	59,932	745	420	2,019	1,502	722	780	969
1987	126,255	58,548	13,588	28,757	1,995	7,768	4,369	1,569	501	62,683	61,403	831	449	2,262	1,697	816	882	1,065
1988	133,903	60,179	14,342	28,221	2,122	8,592	4,631	1,762	510	68,102	66,672	934	496	2,527	1,931	928	1,003	1,165
1989	141,909	60,488	15,231	26,359	2,195	9,314	4,781	2,062	547	75,118	73,501	1,062	556	2,852	2,177	1,046	1,131	1,274

Appendix table 2-5.
U.S. R&D expenditures, by source of funds and performer: 1953–98
(Millions of current dollars)

Funding sector:	Total U.S	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Nonprofit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1990	152,039	61,668	15,671	25,802	2,323	9,935	4,955	2,345	636	83,382	81,602	1,167	614	3,186	2,405	1,156	1,249	1,399
1991	160,863	60,821	15,249	24,095	2,277	10,662	5,163	2,679	696	92,490	90,580	1,243	668	3,457	2,614	1,256	1,358	1,482
1992	165,211	60,922	15,853	22,369	2,353	11,523	5,271	2,806	748	96,411	94,388	1,321	703	3,568	2,787	1,339	1,448	1,524
1993	165,442	60,524	16,532	20,844	1,965	12,311	5,283	2,839	749	96,700	94,591	1,388	721	3,719	2,950	1,418	1,533	1,550
1994	168,854	60,881	16,432	20,261	2,202	13,009	5,317	2,900	759	99,326	97,131	1,448	747	3,960	3,076	1,478	1,598	1,611
1995	183,232	63,220	17,133	21,178	2,273	13,604	5,372	2,848	812	111,005	108,652	1,539	814	4,139	3,126	1,502	1,624	1,741
1996	196,540	63,547	16,627	21,356	2,297	14,180	5,410	2,906	771	123,561	121,015	1,655	891	4,375	3,218	1,546	1,672	1,839
1997	211,268	64,912	16,814	21,798	2,130	14,849	5,466	3,036	820	136,353	133,611	1,773	969	4,686	3,377	1,623	1,754	1,940
1998 ..... prelim.	227,173	66,930	17,189	22,216	2,373	15,558	5,517	3,254	823	149,653	146,706	1,896	1,051	4,979	3,541	1,702	1,840	2,070

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]Because of limitations in the survey information, data on non-Federal government funding to other performers are not available, and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal government support to nonprofits is included in nonprofits' support for their own R&D.

[b]For 1953–54, expenditures of industry FFRDCs were not separated out from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those two years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–54.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[e]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See page 1-8 and figures 2-1, 2-2, and 2-3 in Volume I.

Appendix table 2-6.
U.S. R&D expenditures, by source of funds and performer: 1953–98
(Millions of constant 1992 dollars)

Funding sector:	Total U.S	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Nonprofit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U &Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1953	25,570	13,788	5,030	7,086		738	649	285		11,132	10,902	102	129	181	273	139	134	196
1954	27,538	15,198	4,716	8,574		806	786	316		11,634	11,367	115	152	194	294	152	142	218
1955	30,286	17,373	4,690	9,918	593	921	902	309	41	12,160	11,861	130	169	203	309	154	154	241
1956	39,590	23,186	5,265	13,950	1,551	1,029	1,011	328	51	15,582	15,263	147	172	214	345	177	168	263
1957	44,672	28,101	5,849	17,710	1,835	1,089	1,202	354	63	15,642	15,311	165	167	230	410	230	180	289
1958	48,063	30,709	6,634	19,533	1,422	1,233	1,389	418	79	16,323	15,984	172	167	244	469	273	196	317
1959	54,421	35,587	7,325	22,732	1,821	1,549	1,521	542	96	17,710	17,355	172	183	266	508	292	216	351
1960	58,922	38,312	7,738	24,083	2,050	1,945	1,654	636	206	19,407	19,029	172	206	288	529	292	236	387
1961	61,870	40,290	8,442	24,150	2,358	2,364	1,869	718	389	20,208	19,830	170	208	316	629	365	263	427
1962	65,588	42,526	9,176	25,201	1,787	2,880	2,097	839	545	21,491	21,095	170	227	352	749	457	292	470
1963	72,633	48,281	10,607	28,425	1,716	3,476	2,403	970	684	22,618	22,222	168	228	398	817	493	323	518
1964	78,034	52,142	12,113	29,645	1,891	4,065	2,569	1,021	837	24,050	23,660	165	225	464	817	458	359	562
1965	81,138	52,859	12,645	29,515	1,494	4,675	2,522	1,146	861	26,236	25,821	166	248	545	899	497	403	599
1966	85,982	55,180	12,885	31,075	1,383	5,201	2,538	1,280	818	28,559	28,111	175	273	641	980	538	442	623
1967	88,133	54,975	13,003	29,996	1,582	5,627	2,627	1,291	849	30,749	30,276	194	279	753	1,021	547	474	634
1968	89,241	54,140	12,653	29,468	1,501	5,738	2,612	1,317	850	32,589	32,088	208	293	798	1,047	546	501	668
1969	89,826	52,620	13,097	27,598	1,603	5,610	2,526	1,339	847	34,591	34,060	209	321	805	1,092	556	536	719
1970	86,192	49,161	13,628	23,970	1,552	5,530	2,384	1,344	755	34,280	33,753	215	312	848	1,125	564	561	778
1971	84,067	47,443	13,752	22,380	1,532	5,488	2,291	1,330	671	33,762	33,231	225	306	903	1,142	574	568	817
1972	85,997	47,993	13,991	22,349	1,640	5,655	2,349	1,411	598	35,054	34,515	236	302	932	1,174	592	582	844
1973	87,681	46,989	13,701	21,530	1,544	5,690	2,382	1,603	538	37,673	37,122	254	297	972	1,194	598	596	854
1974	86,731	44,936	13,341	19,683	1,684	5,615	2,407	1,660	546	38,695	38,126	270	299	1,020	1,248	626	621	832
1975	84,785	44,033	13,213	18,717	1,727	5,702	2,535	1,604	535	37,598	37,021	280	297	1,025	1,302	656	646	827
1976	88,571	45,548	13,222	19,464	1,998	5,879	2,841	1,596	550	39,735	39,138	294	303	1,077	1,382	709	672	828
1977	91,622	46,710	13,096	20,078	2,028	6,098	3,269	1,561	580	41,418	40,776	326	316	1,199	1,464	755	709	831
1978	95,937	48,081	13,681	19,860	2,126	6,541	3,588	1,631	653	44,137	43,456	357	324	1,334	1,514	800	714	871
1979	100,527	49,435	13,527	20,558	2,108	6,967	3,785	1,783	706	47,261	46,547	388	326	1,421	1,538	840	698	872
1980	104,975	49,785	12,980	21,137	2,117	7,185	3,922	1,658	787	51,284	50,515	437	332	1,524	1,523	829	695	859
1981	109,540	51,073	13,035	22,719	2,098	7,074	3,761	1,572	814	54,487	53,671	476	341	1,602	1,497	795	701	880
1982	115,201	53,061	13,540	24,314	2,115	6,952	3,717	1,675	748	58,028	57,154	517	356	1,719	1,508	748	760	885
1983	123,058	56,828	14,803	26,100	2,166	7,121	4,023	1,794	820	61,912	60,946	590	376	1,854	1,564	752	813	899
1984	134,758	61,342	15,695	28,526	2,291	7,570	4,395	2,042	823	68,816	67,708	682	426	1,994	1,657	796	861	950
1985	146,118	67,170	16,672	32,259	2,372	8,134	4,723	2,165	844	73,920	72,638	802	479	2,220	1,748	840	908	1,061
1986	149,289	67,896	16,759	32,266	2,347	8,721	5,027	2,110	667	75,821	74,376	925	521	2,505	1,864	896	968	1,203
1987	152,004	70,489	16,360	34,622	2,402	9,352	5,259	1,889	604	75,468	73,926	1,000	541	2,723	2,043	982	1,061	1,282
1988	155,538	69,903	16,659	32,781	2,465	9,980	5,379	2,047	592	79,105	77,445	1,084	577	2,935	2,243	1,078	1,165	1,353
1989	158,168	67,419	16,976	29,379	2,447	10,381	5,329	2,298	610	83,725	81,923	1,183	619	3,178	2,427	1,166	1,261	1,419

Appendix table 2-6.
U.S. R&D expenditures, by source of funds and performer: 1953–98
(Millions of constant 1992 dollars)

Funding sector:	Total U.S	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Nonprofit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1990	162,435	65,884	16,743	27,566	2,482	10,614	5,294	2,506	680	89,084	87,182	1,246	656	3,404	2,569	1,235	1,334	1,494
1991	165,293	62,496	15,669	24,759	2,340	10,956	5,305	2,753	715	95,037	93,074	1,277	686	3,552	2,686	1,291	1,395	1,522
1992	165,211	60,922	15,853	22,369	2,353	11,523	5,271	2,806	748	96,411	94,388	1,321	703	3,568	2,787	1,339	1,448	1,524
1993	161,186	58,967	16,107	20,308	1,914	11,994	5,147	2,766	730	94,213	92,158	1,352	703	3,623	2,874	1,381	1,493	1,510
1994	160,676	57,932	15,637	19,280	2,095	12,379	5,059	2,760	723	94,515	92,426	1,378	710	3,768	2,927	1,407	1,521	1,533
1995	170,432	58,804	15,937	19,699	2,114	12,654	4,996	2,649	755	103,251	101,062	1,431	757	3,850	2,908	1,397	1,511	1,619
1996	179,439	58,018	15,181	19,498	2,097	12,946	4,939	2,653	704	112,810	110,486	1,511	814	3,994	2,938	1,412	1,526	1,679
1997	189,359	58,181	15,071	19,538	1,909	13,309	4,899	2,721	735	122,213	119,755	1,589	869	4,200	3,027	1,454	1,572	1,739
1998 prelim.	201,573	59,388	15,252	19,713	2,106	13,805	4,895	2,887	731	132,789	130,174	1,682	932	4,418	3,142	1,510	1,632	1,837

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]Because of limitations in the survey information, data on non-Federal government funding to other performers are not available, and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal government support to nonprofits is included in nonprofits' support for their own R&D.

[b]For 1953–54, expenditures of industry FFRDCs were not separated out from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those two years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–54.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[e]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See page 1-8 and figures 2-1 and 2-7 in Volume I.

Appendix table 2-7.
U.S. basic research expenditures, by performing sector and source of funds: 1953–98
(Millions of current dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1953	460	102	151	19	132		123	82	7	13	6	16	36	48	27	9	12	
1954	509	96	166	23	143		148	97	10	15	8	18	44	55	31	11	13	
1955	579	98	189	27	162		180	117	14	17	12	21	50	63	36	13	14	
1956	718	114	253	37	216		220	143	19	20	15	24	58	74	42	15	17	
1957	814	124	271	41	230		261	167	25	23	20	27	72	87	49	15	23	
1958	944	149	295	43	252		312	202	31	24	24	31	85	103	59	16	28	
1959	1,087	165	320	72	248		388	263	38	24	28	36	95	120	72	18	30	
1960	1,286	184	376	79	297		485	341	45	25	33	41	106	136	85	21	30	
1961	1,512	230	395	81	314		598	432	54	25	40	48	126	164	105	22	37	
1962	1,824	252	488	143	345		737	546	64	25	48	55	148	200	130	24	46	
1963	2,115	285	522	147	375		909	689	75	25	58	63	175	225	150	25	50	
1964	2,396	339	507	123	384	42	1,071	824	84	25	70	68	200	238	166	25	47	
1965	2,664	375	563	157	406	29	1,221	944	94	27	86	70	218	260	179	29	52	
1966	2,930	410	593	142	451	31	1,380	1,066	104	29	106	75	239	278	188	32	58	
1967	3,168	434	595	168	427	34	1,554	1,188	114	34	136	83	263	289	194	34	61	
1968	3,376	482	607	145	462	35	1,681	1,265	131	38	156	91	276	296	196	37	63	
1969	3,491	545	581	123	458	37	1,754	1,288	153	40	171	103	272	302	192	43	67	
1970	3,594	562	566	122	444	36	1,855	1,323	179	43	196	115	265	311	195	44	72	
1971	3,720	581	557	101	456	33	1,968	1,385	194	50	214	127	252	329	207	45	77	
1972	3,850	603	554	91	463	39	2,038	1,437	195	55	216	134	270	347	216	47	84	
1973	4,099	652	595	96	499	36	2,103	1,489	196	59	223	137	343	371	232	49	90	
1974	4,515	715	650	114	536	49	2,282	1,609	204	66	250	153	415	405	245	54	106	
1975	4,880	760	677	104	573	53	2,480	1,768	212	72	264	164	476	435	255	60	120	
1976	5,376	850	750	116	634	69	2,675	1,924	218	75	283	175	556	477	278	64	135	
1977	6,075	943	836	135	701	75	2,967	2,114	232	89	334	198	734	521	301	70	150	
1978	7,001	1,044	941	156	785	94	3,376	2,399	260	107	398	213	945	601	351	80	170	
1979	7,867	1,112	1,054	161	893	104	3,828	2,719	286	128	466	229	1,077	693	413	85	195	
1980	8,825	1,212	1,205	170	1,035	120	4,315	3,061	307	156	544	248	1,201	771	461	95	215	
1981	9,827	1,343	1,477	164	1,313	137	4,737	3,331	338	183	615	269	1,299	835	505	105	225	
1982	10,803	1,522	1,776	253	1,523	128	5,091	3,475	368	215	716	317	1,406	881	551	115	215	
1983	12,018	1,733	2,106	346	1,760	117	5,518	3,689	396	260	816	358	1,587	958	613	125	220	
1984	13,403	1,877	2,472	340	2,132	136	6,145	4,087	436	313	915	395	1,728	1,047	656	149	242	
1985	14,772	1,947	2,731	358	2,373	131	7,025	4,605	515	389	1,076	440	1,821	1,118	681	173	264	
1986	17,152	2,026	3,930	434	3,496	117	7,943	5,121	606	466	1,262	488	1,955	1,182	700	193	289	
1987	18,393	2,047	4,181	598	3,583	142	8,644	5,527	659	514	1,399	545	2,139	1,240	707	207	326	
1988	19,637	2,116	4,163	656	3,507	337	9,343	5,936	705	565	1,529	607	2,299	1,356	756	228	371	24
1989	21,712	2,309	4,818	986	3,832	398	10,216	6,421	765	638	1,713	679	2,390	1,534	860	256	419	46
1990	22,837	2,319	4,629	869	3,760	499	11,123	6,887	846	706	1,928	756	2,512	1,692	947	282	462	65
1991	26,915	2,378	7,376	1,251	6,125	461	12,059	7,421	911	764	2,126	836	2,719	1,846	1,036	307	503	77

Appendix table 2-7.
U.S. basic research expenditures, by performing sector and source of funds: 1953–98
(Millions of current dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1992	27,258	2,419	6,528	712	5,816	474	12,907	8,056	940	815	2,202	893	2,891	1,973	1,114	323	536	67
1993	28,312	2,623	6,427	466	5,961	492	13,679	8,661	950	850	2,279	939	2,968	2,052	1,153	332	567	72
1994	29,046	2,553	6,514	436	6,078	503	14,472	9,186	988	888	2,429	980	2,870	2,060	1,126	343	591	74
1995	28,909	2,695	5,569	190	5,379	530	15,233	9,683	1,068	945	2,540	997	2,661	2,146	1,170	375	601	76
1996	32,012	2,689	7,498	650	6,848	708	16,129	10,201	1,143	1,028	2,719	1,039	2,632	2,277	1,249	410	619	79
1997	35,499	2,735	9,795	1,029	8,766	625	17,143	10,735	1,224	1,119	2,958	1,107	2,696	2,412	1,317	446	649	95
1998 prelim.	37,877	2,920	10,765	1,140	9,625	676	18,100	11,248	1,315	1,205	3,164	1,169	2,721	2,584	1,420	483	681	111

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]For 1953–63, basic research of industry FFRDCs were not separated out from total Federal support to the industrial sector for basic research. Thus, the figure for Federal support to industry for basic research includes support for basic research at industry FFRDCs for those years. The same is true for basic research by nonprofit FFRDCs in 1953–87, which is included in Federal support for basic research at nonprofit institutions for those years.

[b]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figures 2-2, 2-7, 2-15, and 2-16; text table 2-1; and figures 6-1 and 6-2 in Volume I.

Appendix table 2-8.
U.S. basic research expenditures, by performing sector and source of funds: 1953–98
(Millions of constant 1992 dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1953	2,277	503	748	94	654		610	404	32	64	30	79	178	238	134	45	59	
1954	2,491	470	813	113	701		723	473	47	73	41	88	216	269	152	54	64	
1955	2,792	470	911	130	781		865	562	67	82	56	99	241	304	174	63	68	
1956	3,344	529	1,178	172	1,006		1,025	664	89	91	72	109	270	342	193	70	79	
1957	3,668	559	1,222	185	1,037		1,174	751	112	101	89	122	322	390	219	68	104	
1958	4,155	656	1,299	189	1,110		1,374	889	137	106	105	137	374	451	258	70	123	
1959	4,736	717	1,394	314	1,081		1,691	1,144	164	105	124	155	412	523	314	78	131	
1960	5,526	789	1,616	339	1,276		2,082	1,463	193	105	144	176	456	584	365	90	129	
1961	6,421	975	1,678	344	1,334		2,538	1,833	228	106	169	202	533	697	446	93	157	
1962	7,651	1,057	2,047	600	1,447		3,089	2,288	267	105	200	229	619	839	545	101	193	
1963	8,769	1,180	2,164	609	1,555		3,767	2,857	311	102	239	259	726	933	622	104	207	
1964	9,788	1,385	2,071	502	1,569	172	4,373	3,364	345	102	284	278	815	972	678	102	192	
1965	10,673	1,500	2,256	629	1,627	116	4,890	3,780	378	106	345	280	871	1,040	715	116	208	
1966	11,414	1,597	2,310	553	1,757	121	5,376	4,153	403	113	415	292	929	1,081	730	125	226	
1967	11,957	1,636	2,246	634	1,612	128	5,864	4,483	430	126	512	313	993	1,089	730	128	230	
1968	12,214	1,744	2,196	525	1,671	127	6,080	4,577	473	136	565	329	997	1,071	709	134	228	
1969	12,062	1,884	2,008	425	1,583	128	6,059	4,449	528	136	591	354	940	1,044	663	149	232	
1970	11,791	1,844	1,857	400	1,457	118	6,086	4,339	588	141	642	376	868	1,019	638	144	236	
1971	11,604	1,813	1,737	315	1,422	103	6,138	4,318	604	154	667	395	786	1,026	646	140	240	
1972	11,520	1,803	1,658	272	1,385	117	6,097	4,300	585	165	647	401	808	1,038	646	141	251	
1973	11,613	1,847	1,686	272	1,414	102	5,958	4,217	556	166	632	387	972	1,050	656	139	255	
1974	11,736	1,858	1,690	296	1,393	127	5,931	4,182	530	172	650	396	1,077	1,053	637	140	276	
1975	11,594	1,805	1,608	247	1,361	126	5,891	4,201	505	170	626	390	1,130	1,033	606	143	285	
1976	12,067	1,908	1,684	260	1,423	155	6,003	4,319	489	168	636	392	1,248	1,070	623	144	303	
1977	12,809	1,988	1,763	285	1,478	158	6,254	4,457	489	188	705	416	1,546	1,099	635	148	316	
1978	13,757	2,052	1,849	307	1,543	185	6,634	4,714	510	209	783	418	1,856	1,181	690	157	334	
1979	14,245	2,014	1,908	292	1,617	188	6,930	4,923	518	231	844	415	1,950	1,254	747	154	353	
1980	14,627	2,009	1,997	282	1,716	199	7,152	5,073	509	258	902	411	1,991	1,278	765	157	356	
1981	14,887	2,034	2,238	248	1,989	208	7,175	5,046	512	277	932	408	1,967	1,265	765	159	341	
1982	15,396	2,168	2,531	361	2,170	182	7,255	4,952	524	307	1,021	451	2,003	1,256	786	164	306	
1983	16,427	2,368	2,879	473	2,406	160	7,542	5,042	541	355	1,116	489	2,169	1,309	837	171	301	
1984	17,655	2,472	3,256	448	2,808	179	8,093	5,383	574	412	1,205	520	2,275	1,379	864	196	319	
1985	18,811	2,480	3,478	456	3,022	167	8,945	5,864	655	495	1,370	560	2,318	1,424	868	220	336	
1986	21,286	2,514	4,877	539	4,339	145	9,857	6,355	752	578	1,567	605	2,426	1,467	869	240	358	
1987	22,144	2,465	5,034	720	4,314	171	10,406	6,654	793	619	1,685	656	2,575	1,493	851	249	393	
1988	22,809	2,458	4,836	762	4,074	391	10,852	6,895	819	656	1,776	705	2,670	1,575	878	265	431	28
1989	24,199	2,573	5,370	1,099	4,271	444	11,387	7,156	853	711	1,909	757	2,664	1,710	959	285	466	52
1990	24,399	2,477	4,946	928	4,017	533	11,883	7,357	904	754	2,060	807	2,683	1,807	1,012	302	494	69
1991	27,656	2,444	7,579	1,285	6,294	474	12,391	7,625	936	785	2,185	859	2,794	1,896	1,064	316	516	79
1992	27,258	2,419	6,528	712	5,816	474	12,907	8,056	940	815	2,202	893	2,891	1,973	1,114	323	536	67

Appendix table 2-8.
U.S. basic research expenditures, by performing sector and source of funds: 1953–98
(Millions of constant 1992 dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1993	27,584	2,555	6,262	454	5,808	479	13,327	8,438	925	829	2,220	915	2,892	1,999	1,123	323	553	70
1994	27,639	2,429	6,198	415	5,784	479	13,771	8,741	940	845	2,311	933	2,731	1,961	1,071	327	563	71
1995	26,890	2,507	5,180	177	5,003	493	14,168	9,006	994	879	2,363	927	2,475	1,996	1,088	348	559	70
1996	29,227	2,455	6,846	593	6,252	646	14,726	9,313	1,043	939	2,482	948	2,403	2,079	1,140	374	565	73
1997	31,818	2,451	8,779	922	7,857	560	15,365	9,621	1,098	1,003	2,651	992	2,416	2,162	1,181	400	582	85
1998 prelim. ...	33,609	2,591	9,552	1,012	8,540	600	16,060	9,980	1,167	1,069	2,807	1,037	2,414	2,292	1,260	429	604	99

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]For 1953–63, basic research of industry FFRDCs were not separated out from total Federal support to the industrial sector for basic research. Thus, the figure for Federal support to industry for basic research includes support for basic research at industry FFRDCs for those years. The same is true for basic research by nonprofit FFRDCs in 1953–87, which is included in Federal support for basic research at nonprofit institutions for those years.

[b]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series)

See figure 2-15 in Volume I.

Appendix table 2-9.
U.S. basic research expenditures, by source of funds and performer: 1953–98
(Millions of current dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Nonprofit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1953	460	265	102	19		82	36	27		154	132	13	9	6	28	12	16	7
1954	509	291	96	23		97	44	31		169	143	15	11	8	31	13	18	10
1955	579	327	98	27		117	50	36		192	162	17	13	12	35	14	21	14
1956	718	393	114	37		143	58	42		251	216	20	15	15	41	17	24	19
1957	814	452	124	41		167	72	49		268	230	23	15	20	50	23	27	25
1958	944	538	149	43		202	85	59		292	252	24	16	24	59	28	31	31
1959	1,087	666	165	72		263	95	72		290	248	24	18	28	66	30	36	38
1960	1,286	794	184	79		341	106	85		343	297	25	21	33	71	30	41	45
1961	1,512	973	230	81		432	126	105		361	314	25	22	40	85	37	48	54
1962	1,824	1,218	252	143		546	148	130		394	345	25	24	48	101	46	55	64
1963	2,115	1,446	285	147		689	175	150		425	375	25	25	58	113	50	63	75
1964	2,396	1,693	339	123	42	824	200	166		434	384	25	25	70	115	47	68	84
1965	2,664	1,900	375	157	29	944	218	179		462	406	27	29	86	122	52	70	94
1966	2,930	2,075	410	142	31	1,066	239	188		512	451	29	32	106	133	58	75	104
1967	3,168	2,280	434	168	34	1,188	263	194		495	427	34	34	136	144	61	83	114
1968	3,376	2,399	482	145	35	1,265	276	196		537	462	38	37	156	154	63	91	131
1969	3,491	2,457	545	123	37	1,288	272	192		541	458	40	43	171	170	67	103	153
1970	3,594	2,501	562	122	36	1,323	265	195		531	444	43	44	196	187	72	115	179
1971	3,720	2,559	581	101	33	1,385	252	207		551	456	50	45	214	204	77	127	194
1972	3,850	2,656	603	91	39	1,437	270	216		565	463	55	47	216	218	84	134	195
1973	4,099	2,847	652	96	36	1,489	343	232		607	499	59	49	223	227	90	137	196
1974	4,515	3,146	715	114	49	1,609	415	245		656	536	66	54	250	259	106	153	204
1975	4,880	3,415	760	104	53	1,768	476	255		705	573	72	60	264	284	120	164	212
1976	5,376	3,793	850	116	69	1,924	556	278		773	634	75	64	283	310	135	175	218
1977	6,075	4,302	943	135	75	2,114	734	301		860	701	89	70	334	348	150	198	232
1978	7,001	4,989	1,044	156	94	2,399	945	351		972	785	107	80	398	383	170	213	260
1979	7,867	5,586	1,112	161	104	2,719	1,077	413		1,106	893	128	85	466	424	195	229	286
1980	8,825	6,225	1,212	170	120	3,061	1,201	461		1,286	1,035	156	95	544	463	215	248	307
1981	9,827	6,778	1,343	164	137	3,331	1,299	505		1,601	1,313	183	105	615	494	225	269	338
1982	10,803	7,334	1,522	253	128	3,475	1,406	551		1,853	1,523	215	115	716	532	215	317	368
1983	12,018	8,084	1,733	346	117	3,689	1,587	613		2,145	1,760	260	125	816	578	220	358	396
1984	13,403	8,823	1,877	340	136	4,087	1,728	656		2,593	2,132	313	149	915	637	242	395	436
1985	14,772	9,543	1,947	358	131	4,605	1,821	681		2,935	2,373	389	173	1,076	704	264	440	515
1986	17,152	10,352	2,026	434	117	5,121	1,955	700		4,155	3,496	466	193	1,262	776	289	488	606
1987	18,393	11,160	2,047	598	142	5,527	2,139	707		4,304	3,583	514	207	1,399	871	326	545	659
1988	19,637	12,124	2,116	656	337	5,936	2,299	756	24	4,300	3,507	565	228	1,529	978	371	607	705

Appendix table 2-9.
U.S. basic research expenditures, by source of funds and performer: 1953–98
(Millions of current dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Nonprofit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1989	21,712	13,410	2,309	986	398	6,421	2,390	860	46	4,725	3,832	638	256	1,713	1,098	419	679	765
1990	22,837	14,096	2,319	869	499	6,887	2,512	947	65	4,748	3,760	706	282	1,928	1,218	462	756	846
1991	26,915	15,343	2,378	1,251	461	7,421	2,719	1,036	77	7,197	6,125	764	307	2,126	1,338	503	836	911
1992	27,258	15,732	2,419	712	474	8,056	2,891	1,114	67	6,954	5,816	815	323	2,202	1,429	536	893	940
1993	28,312	16,434	2,623	466	492	8,661	2,968	1,153	72	7,143	5,961	850	332	2,279	1,506	567	939	950
1994	29,046	16,748	2,553	436	503	9,186	2,870	1,126	74	7,310	6,078	888	343	2,429	1,572	591	980	988
1995	28,909	17,004	2,695	190	530	9,683	2,661	1,170	76	6,698	5,379	945	375	2,540	1,598	601	997	1,068
1996	32,012	18,208	2,689	650	708	10,201	2,632	1,249	79	8,286	6,848	1,028	410	2,719	1,657	619	1,039	1,143
1997	35,499	19,230	2,735	1,029	625	10,735	2,696	1,317	95	10,331	8,766	1,119	446	2,958	1,756	649	1,107	1,224
1998 prelim.	37,877	20,235	2,920	1,140	676	11,248	2,721	1,420	111	11,313	9,625	1,205	483	3,164	1,850	681	1,169	1,315

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]Because of limitations in the survey information, data on non-Federal government funding to other performers are not available, and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal government support to nonprofits is included in nonprofits' support for their own R&D.

[b]For 1953–63, basic research of industry FFRDCs were not separated out from total Federal support to the industrial sector for basic research. Thus, the figure for Federal support to industry for basic research includes support for basic research at industry FFRDCs for those years. The same is true for basic research by nonprofit FFRDCs in 1953–87, which is included in Federal support for basic research at nonprofit institutions for those years.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[e]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figures 2-16 and 2-17 in Volume I.

Appendix table 2-10.
U.S. basic research expenditures, by source of funds and performer: 1953–98
(Millions of constant 1992 dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Nonprofit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1953	2,277	1,313	503	94		404	178	134		763	654	64	45	30	139	59	79	32
1954	2,491	1,423	470	113		473	216	152		828	701	73	54	41	152	64	88	47
1955	2,792	1,577	470	130		562	241	174		926	781	82	63	56	166	68	99	67
1956	3,344	1,828	529	172		664	270	193		1,167	1,006	91	70	72	189	79	109	89
1957	3,668	2,036	559	185		751	322	219		1,206	1,037	101	68	89	225	104	122	112
1958	4,155	2,367	656	189		889	374	258		1,286	1,110	106	70	105	260	123	137	137
1959	4,736	2,900	717	314		1,144	412	314		1,264	1,081	105	78	124	285	131	155	164
1960	5,526	3,412	789	339		1,463	456	365		1,472	1,276	105	90	144	305	129	176	193
1961	6,421	4,131	975	344		1,833	533	446		1,534	1,334	106	93	169	359	157	202	228
1962	7,651	5,109	1,057	600		2,288	619	545		1,653	1,447	105	101	200	422	193	229	267
1963	8,769	5,993	1,180	609		2,857	726	622		1,760	1,555	102	104	239	466	207	259	311
1964	9,788	6,916	1,385	502	172	3,364	815	678		1,773	1,569	102	102	284	470	192	278	345
1965	10,673	7,612	1,500	629	116	3,780	871	715		1,849	1,627	106	116	345	489	208	280	378
1966	11,414	8,083	1,597	553	121	4,153	929	730		1,995	1,757	113	125	415	518	226	292	403
1967	11,957	8,605	1,636	634	128	4,483	993	730		1,867	1,612	126	128	512	544	230	313	430
1968	12,214	8,678	1,744	525	127	4,577	997	709		1,941	1,671	136	134	565	557	228	329	473
1969	12,062	8,489	1,884	425	128	4,449	940	663		1,868	1,583	136	149	591	586	232	354	528
1970	11,791	8,207	1,844	400	118	4,339	868	638		1,742	1,457	141	144	642	612	236	376	588
1971	11,604	7,981	1,813	315	103	4,318	786	646		1,717	1,422	154	140	667	635	240	395	604
1972	11,520	7,946	1,803	272	117	4,300	808	646		1,691	1,385	165	141	647	652	251	401	585
1973	11,613	8,065	1,847	272	102	4,217	972	656		1,718	1,414	166	139	632	642	255	387	556
1974	11,736	8,178	1,858	296	127	4,182	1,077	637		1,705	1,393	172	140	650	672	276	396	530
1975	11,594	8,114	1,805	247	126	4,201	1,130	606		1,674	1,361	170	143	626	675	285	390	505
1976	12,067	8,513	1,908	260	155	4,319	1,248	623		1,735	1,423	168	144	636	695	303	392	489
1977	12,809	9,069	1,988	285	158	4,457	1,546	635		1,813	1,478	188	148	705	733	316	416	489
1978	13,757	9,803	2,052	307	185	4,714	1,856	690		1,909	1,543	209	157	783	752	334	418	510
1979	14,245	10,114	2,014	292	188	4,923	1,950	747		2,002	1,617	231	154	844	768	353	415	518
1980	14,627	10,318	2,009	282	199	5,073	1,991	765		2,131	1,716	258	157	902	767	356	411	509
1981	14,887	10,269	2,034	248	208	5,046	1,967	765		2,425	1,989	277	159	932	749	341	408	512
1982	15,396	10,452	2,168	361	182	4,952	2,003	786		2,641	2,170	307	164	1,021	758	306	451	524
1983	16,427	11,049	2,368	473	160	5,042	2,169	837		2,932	2,406	355	171	1,116	790	301	489	541
1984	17,655	11,621	2,472	448	179	5,383	2,275	864		3,416	2,808	412	196	1,205	839	319	520	574
1985	18,811	12,152	2,480	456	167	5,864	2,318	868		3,737	3,022	495	220	1,370	896	336	560	655
1986	21,286	12,847	2,514	539	145	6,355	2,426	869		5,156	4,339	578	240	1,567	964	358	605	752
1987	22,144	13,436	2,465	720	171	6,654	2,575	851		5,181	4,314	619	249	1,685	1,049	393	656	793
1988	22,809	14,082	2,458	762	391	6,895	2,670	878	28	4,995	4,074	656	265	1,776	1,136	431	705	819
1989	24,199	14,946	2,573	1,099	444	7,156	2,664	959	52	5,267	4,271	711	285	1,909	1,224	466	757	853
1990	24,399	15,060	2,477	928	533	7,357	2,683	1,012	69	5,073	4,017	754	302	2,060	1,301	494	807	904
1991	27,656	15,766	2,444	1,285	474	7,625	2,794	1,064	79	7,395	6,294	785	316	2,185	1,375	516	859	936

Appendix table 2-10.
U.S. basic research expenditures, by source of funds and performer: 1953–98
(Millions of constant 1992 dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Nonprofit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1992	27,258	15,732	2,419	712	474	8,056	2,891	1,114	67	6,954	5,816	815	323	2,202	1,429	536	893	940
1993	27,584	16,011	2,555	454	479	8,438	2,892	1,123	70	6,959	5,808	829	323	2,220	1,468	553	915	925
1994	27,639	15,937	2,429	415	479	8,741	2,731	1,071	71	6,956	5,784	845	327	2,311	1,495	563	933	940
1995	26,890	15,817	2,507	177	493	9,006	2,475	1,088	70	6,230	5,003	879	348	2,363	1,486	559	927	994
1996	29,227	16,624	2,455	593	646	9,313	2,403	1,140	73	7,565	6,252	939	374	2,482	1,513	565	948	1,043
1997	31,818	17,236	2,451	922	560	9,621	2,416	1,181	85	9,259	7,857	1,003	400	2,651	1,574	582	992	1,098
1998 prelim.	33,609	17,955	2,591	1,012	600	9,980	2,414	1,260	99	10,038	8,540	1,069	429	2,807	1,641	604	1,037	1,167

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]Because of limitations in the survey information, data on non-Federal government funding to other performers are not available, and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal government support to nonprofits is included in nonprofits' support for their own R&D.

[b]For 1953–63, basic research of industry FFRDCs were not separated out from total Federal support to the industrial sector for basic research. Thus, the figure for Federal support to industry for basic research includes support for basic research at industry FFRDCs for those years. The same is true for basic research by nonprofit FFRDCs in 1953–87, which is included in Federal support for basic research at nonprofit institutions for those years.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[e]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

Appendix table 2-11.
U.S. applied research expenditures, by performing sector and source of funds: 1953–98
(Millions of current dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1953	1,289	347	726	288	438		134	59	30	7	28	10	48	35	14	11	10	
1954	1,378	330	814	322	492		137	60	32	8	28	10	58	40	16	13	11	
1955	1,514	333	928	368	560		142	63	32	9	27	11	68	43	18	14	11	
1956	1,928	387	1,268	474	794		146	65	33	10	27	11	79	49	21	14	14	
1957	2,414	446	1,670	678	992		147	63	34	12	27	11	94	58	24	14	20	
1958	2,758	516	1,911	774	1,137		152	66	35	12	27	12	111	69	30	14	25	
1959	2,940	577	1,991	813	1,178		167	78	37	13	28	12	121	85	43	15	27	
1960	3,065	615	2,029	833	1,196		186	93	39	13	29	12	129	108	63	17	28	
1961	3,123	668	1,977	812	1,165		199	104	40	13	30	13	145	135	83	17	35	
1962	3,698	709	2,449	1,011	1,438		216	119	41	14	30	13	163	162	98	19	45	
1963	3,865	809	2,457	1,007	1,450		230	128	42	14	32	14	186	183	115	19	49	
1964	4,201	947	2,538	978	1,560	62	256	142	45	14	37	18	203	196	130	19	47	
1965	4,374	994	2,612	992	1,620	46	304	176	46	13	42	27	206	213	140	21	52	
1966	4,653	1,012	2,790	986	1,804	53	351	208	47	14	48	34	213	234	153	24	57	
1967	4,848	1,069	2,832	983	1,849	83	389	238	46	16	54	36	225	251	166	25	60	
1968	5,137	1,112	3,037	956	2,081	87	405	250	46	16	55	39	221	276	186	28	62	
1969	5,454	1,229	3,192	920	2,272	95	417	257	48	16	54	43	213	308	210	32	66	
1970	5,752	1,334	3,330	952	2,378	97	451	280	51	18	56	47	213	328	225	33	70	
1971	5,833	1,355	3,348	907	2,441	67	499	306	61	19	67	47	216	349	241	34	74	
1972	6,147	1,434	3,407	845	2,562	107	619	391	74	21	82	52	224	357	243	35	79	
1973	6,655	1,527	3,715	883	2,832	110	725	450	88	26	100	62	203	376	257	36	83	
1974	7,347	1,652	4,168	905	3,263	120	794	477	96	32	118	72	191	423	290	40	93	
1975	8,098	1,912	4,431	991	3,440	139	934	550	113	39	141	92	219	463	315	43	105	
1976	8,990	2,068	4,945	1,033	3,912	167	1,042	596	127	45	166	109	263	506	338	48	120	
1977	9,690	2,081	5,424	1,113	4,311	212	1,126	626	134	51	194	121	305	543	355	53	135	
1978	10,731	2,242	6,065	1,195	4,870	235	1,247	676	151	61	232	128	329	614	409	55	150	
1979	12,148	2,415	6,975	1,305	5,670	250	1,418	793	161	71	263	129	380	710	480	60	170	
1980	13,773	2,546	8,175	1,625	6,550	275	1,622	912	174	88	308	140	421	734	489	65	180	
1981	16,421	2,731	10,401	2,042	8,359	298	1,781	953	199	108	363	159	423	786	521	75	190	
1982	18,303	2,802	11,956	2,593	9,363	367	1,915	1,007	207	121	402	178	439	825	550	85	190	
1983	20,408	2,991	13,513	3,227	10,286	414	2,116	1,122	215	141	443	194	494	880	585	95	200	
1984	22,540	2,961	15,218	3,677	11,541	547	2,332	1,226	234	168	491	212	561	921	594	110	218	
1985	25,437	3,135	17,625	4,717	12,908	630	2,527	1,297	261	198	547	224	573	947	581	128	237	
1986	27,292	3,204	19,131	4,049	15,082	629	2,779	1,393	298	229	620	240	547	1,003	600	143	260	
1987	27,968	3,366	19,190	4,037	15,153	623	3,219	1,643	333	260	707	276	531	1,039	593	153	294	
1988	29,621	3,362	20,377	3,846	16,531	371	3,779	1,957	377	302	818	325	565	1,102	599	169	334	66
1989	32,381	3,566	22,317	4,324	17,993	374	4,188	2,120	417	347	933	370	605	1,260	695	189	377	70
1990	35,095	3,652	24,399	5,967	18,432	386	4,406	2,139	453	378	1,032	404	767	1,404	780	209	416	81
1991	38,764	4,093	27,013	5,588	21,425	433	4,609	2,230	468	392	1,091	428	929	1,600	921	227	452	86
1992	38,066	4,337	25,660	4,476	21,184	507	4,881	2,413	479	415	1,120	455	946	1,654	933	239	482	81

Appendix table 2-11.

U.S. applied research expenditures, by performing sector and source of funds: 1953–98

(Millions of current dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1993	37,379	4,838	24,251	4,295	19,956	435	5,128	2,529	492	440	1,180	486	969	1,655	900	245	510	103
1994	36,689	5,003	22,988	3,616	19,372	503	5,357	2,625	511	459	1,255	507	980	1,746	960	254	532	112
1995	41,085	5,007	26,919	3,164	23,755	535	5,622	2,758	551	487	1,311	514	1,117	1,753	935	277	541	131
1996	43,156	4,874	29,010	3,640	25,370	231	5,816	2,854	571	514	1,358	519	1,284	1,819	960	303	557	122
1997	47,203	5,079	32,430	2,648	29,782	213	6,022	2,951	587	536	1,417	530	1,413	1,924	1,010	330	584	123
1998 prelim.	51,221	5,421	35,566	2,865	32,701	222	6,354	3,130	619	567	1,489	550	1,545	2,010	1,040	357	613	104

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]For 1953–63, applied research of industry FFRDCs were not separated out from total Federal support to the industrial sector for applied research. Thus, the figure for Federal support to industry for applied research includes support for applied research at industry FFRDCs for those years. The same is true for applied research by nonprofit FFRDCs in 1953–87, which is included in Federal support for applied research at nonprofit institutions for those years.

[b]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar-year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figures 2-2, 2-15, and 2-16; text table 2-1; and figures 6-1 and 6-2 in Volume I.

Appendix table 2-12.
U.S. applied research expenditures, by performing sector and source of funds: 1953–98
(Millions of constant 1992 dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1953	6,388	1,720	3,598	1,427	2,170		662	292	149	32	138	50	235	173	69	55	50	
1954	6,752	1,614	3,988	1,578	2,411		669	292	154	37	137	49	284	196	78	64	54	
1955	7,297	1,606	4,474	1,774	2,700		682	304	156	41	131	51	328	207	87	68	53	
1956	8,978	1,800	5,906	2,208	3,698		680	303	154	47	125	51	366	226	95	65	65	
1957	10,881	2,009	7,529	3,057	4,472		661	284	153	52	122	50	424	259	106	63	90	
1958	12,144	2,272	8,415	3,408	5,007		667	288	155	53	120	51	487	304	132	62	110	
1959	12,808	2,512	8,675	3,542	5,133		728	338	161	54	122	52	525	368	185	65	118	
1960	13,171	2,641	8,719	3,580	5,140		797	400	166	56	124	52	552	462	269	73	120	
1961	13,267	2,838	8,398	3,449	4,949		843	440	170	55	126	53	616	571	350	72	149	
1962	15,510	2,972	10,273	4,241	6,032		906	497	170	57	128	55	682	677	409	80	189	
1963	16,022	3,354	10,187	4,175	6,012		951	529	175	58	134	56	771	759	477	79	203	
1964	17,161	3,866	10,368	3,995	6,373	253	1,044	580	185	55	152	71	829	801	531	78	192	
1965	17,522	3,980	10,465	3,974	6,490	184	1,216	703	186	52	169	106	823	853	561	84	208	
1966	18,124	3,942	10,869	3,841	7,028	206	1,367	810	183	55	189	131	830	910	594	93	222	
1967	18,301	4,034	10,691	3,711	6,980	313	1,467	897	172	59	203	136	849	948	627	94	227	
1968	18,585	4,021	10,988	3,459	7,529	315	1,465	903	166	58	199	139	798	999	673	101	224	
1969	18,847	4,248	11,030	3,179	7,851	328	1,441	886	166	55	186	147	736	1,064	726	111	228	
1970	18,873	4,377	10,925	3,123	7,802	318	1,478	917	168	57	183	153	699	1,076	738	108	230	
1971	18,194	4,226	10,443	2,829	7,614	209	1,556	954	189	58	209	147	672	1,087	750	106	231	
1972	18,393	4,291	10,194	2,528	7,666	320	1,851	1,168	222	61	245	154	670	1,067	726	105	236	
1973	18,854	4,327	10,524	2,501	8,023	312	2,052	1,273	248	74	283	174	574	1,065	728	102	235	
1974	19,099	4,295	10,834	2,352	8,482	312	2,063	1,239	250	82	306	186	495	1,100	754	104	242	
1975	19,239	4,542	10,527	2,354	8,173	330	2,219	1,306	269	91	334	219	520	1,100	748	102	249	
1976	20,180	4,643	11,100	2,319	8,781	375	2,339	1,337	286	100	372	245	589	1,135	758	108	269	
1977	20,429	4,387	11,436	2,347	9,089	447	2,373	1,319	284	108	409	254	642	1,145	748	112	285	
1978	21,087	4,405	11,918	2,348	9,570	462	2,450	1,328	297	119	455	251	647	1,206	803	108	295	
1979	21,995	4,373	12,629	2,363	10,266	453	2,567	1,435	292	129	476	233	688	1,286	869	109	308	
1980	22,829	4,220	13,550	2,694	10,857	456	2,689	1,512	288	146	511	232	698	1,216	810	108	298	
1981	24,876	4,138	15,757	3,093	12,663	451	2,698	1,443	302	163	549	240	642	1,191	790	114	288	
1982	26,084	3,993	17,039	3,695	13,343	523	2,729	1,434	296	172	573	253	626	1,176	784	121	271	
1983	27,895	4,089	18,470	4,411	14,060	566	2,892	1,534	294	193	606	265	675	1,203	800	130	273	
1984	29,689	3,900	20,045	4,843	15,202	720	3,071	1,615	308	221	647	279	739	1,214	782	145	287	
1985	32,391	3,992	22,444	6,007	16,437	802	3,218	1,651	333	252	697	285	730	1,205	740	163	302	
1986	33,870	3,976	23,742	5,025	18,717	781	3,449	1,729	369	284	769	297	678	1,244	745	177	322	
1987	33,671	4,052	23,104	4,860	18,243	750	3,875	1,978	401	313	852	332	639	1,251	714	184	353	
1988	34,407	3,905	23,669	4,467	19,202	431	4,389	2,274	438	351	950	377	656	1,280	695	196	388	76
1989	36,091	3,975	24,874	4,819	20,055	417	4,668	2,363	465	387	1,040	413	675	1,405	774	211	420	78
1990	37,495	3,902	26,067	6,375	19,692	412	4,707	2,285	484	404	1,102	432	819	1,500	833	223	444	87
1991	39,832	4,206	27,757	5,742	22,015	445	4,736	2,291	481	403	1,121	440	955	1,644	946	233	465	89

Appendix table 2-12.
U.S. applied research expenditures, by performing sector and source of funds: 1953–98
(Millions of constant 1992 dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1992	38,066	4,337	25,660	4,476	21,184	507	4,881	2,413	479	415	1,120	455	946	1,654	933	239	482	81
1993	36,417	4,714	23,627	4,185	19,443	424	4,996	2,464	479	429	1,150	474	944	1,613	876	239	497	100
1994	34,912	4,761	21,875	3,441	18,434	479	5,097	2,498	486	437	1,195	482	933	1,661	913	242	506	106
1995	38,215	4,657	25,039	2,943	22,096	498	5,230	2,566	513	453	1,219	478	1,039	1,630	870	258	503	122
1996	39,401	4,450	26,486	3,323	23,163	211	5,310	2,606	521	469	1,240	474	1,172	1,661	876	277	508	111
1997	42,308	4,552	29,067	2,373	26,694	191	5,397	2,645	526	480	1,270	475	1,266	1,725	906	295	524	110
1998 prelim.	45,449	4,810	31,558	2,542	29,016	197	5,638	2,777	549	503	1,321	488	1,371	1,784	923	317	544	92

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]For 1953–63, applied research of industry FFRDCs were not separated out from total Federal support to the industrial sector for applied research. Thus, the figure for Federal support to industry for applied research includes support for applied research at industry FFRDCs for those years. The same is true for applied research by nonprofit FFRDCs in 1953–87, which is included in Federal support for applied research at nonprofit institutions for those years.

[b]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar-year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figure 2-15 in Volume I.

Appendix table 2-13.
U.S. applied research expenditures, by source of funds and performer: 1953–98
(Millions of current dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Non-profit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1953	1,289	756	347	288		59	48	14		456	438	7	11	28	20	10	10	30
1954	1,378	785	330	322		60	58	16		513	492	8	13	28	21	11	10	32
1955	1,514	850	333	368		63	68	18		583	560	9	14	27	22	11	11	32
1956	1,928	1,025	387	474		65	79	21		818	794	10	14	27	25	14	11	33
1957	2,414	1,304	446	678		63	94	24		1,018	992	12	14	27	31	20	11	34
1958	2,758	1,496	516	774		66	111	30		1,163	1,137	12	14	27	37	25	12	35
1959	2,940	1,630	577	813		78	121	43		1,206	1,178	13	15	28	39	27	12	37
1960	3,065	1,732	615	833		93	129	63		1,226	1,196	13	17	29	40	28	12	39
1961	3,123	1,811	668	812		104	145	83		1,195	1,165	13	17	30	48	35	13	40
1962	3,698	2,098	709	1,011		119	163	98		1,471	1,438	14	19	30	58	45	13	41
1963	3,865	2,245	809	1,007		128	186	115		1,483	1,450	14	19	32	63	49	14	42
1964	4,201	2,462	947	978	62	142	203	130		1,593	1,560	14	19	37	65	47	18	45
1965	4,374	2,553	994	992	46	176	206	140		1,654	1,620	13	21	42	79	52	27	46
1966	4,653	2,625	1,012	986	53	208	213	153		1,842	1,804	14	24	48	91	57	34	47
1967	4,848	2,763	1,069	983	83	238	225	166		1,890	1,849	16	25	54	96	60	36	46
1968	5,137	2,811	1,112	956	87	250	221	186		2,125	2,081	16	28	55	101	62	39	46
1969	5,454	2,924	1,229	920	95	257	213	210		2,320	2,272	16	32	54	109	66	43	48
1970	5,752	3,100	1,334	952	97	280	213	225		2,429	2,378	18	33	56	117	70	47	51
1971	5,833	3,091	1,355	907	67	306	216	241		2,494	2,441	19	34	67	121	74	47	61
1972	6,147	3,243	1,434	845	107	391	224	243		2,618	2,562	21	35	82	131	79	52	74
1973	6,655	3,429	1,527	883	110	450	203	257		2,894	2,832	26	36	100	145	83	62	88
1974	7,347	3,634	1,652	905	120	477	191	290		3,335	3,263	32	40	118	165	93	72	96
1975	8,098	4,125	1,912	991	139	550	219	315		3,522	3,440	39	43	141	197	105	92	113
1976	8,990	4,464	2,068	1,033	167	596	263	338		4,005	3,912	45	48	166	229	120	109	127
1977	9,690	4,691	2,081	1,113	212	626	305	355		4,415	4,311	51	53	194	256	135	121	134
1978	10,731	5,085	2,242	1,195	235	676	329	409		4,986	4,870	61	55	232	278	150	128	151
1979	12,148	5,623	2,415	1,305	250	793	380	480		5,801	5,670	71	60	263	299	170	129	161
1980	13,773	6,268	2,546	1,625	275	912	421	489		6,703	6,550	88	65	308	320	180	140	174
1981	16,421	6,969	2,731	2,042	298	953	423	521		8,542	8,359	108	75	363	349	190	159	199
1982	18,303	7,757	2,802	2,593	367	1,007	439	550		9,569	9,363	121	85	402	368	190	178	207
1983	20,408	8,834	2,991	3,227	414	1,122	494	585		10,522	10,286	141	95	443	394	200	194	215
1984	22,540	9,566	2,961	3,677	547	1,226	561	594		11,819	11,541	168	110	491	430	218	212	234
1985	25,437	10,933	3,135	4,717	630	1,297	573	581		13,233	12,908	198	128	547	461	237	224	261.
1986	27,292	10,422	3,204	4,049	629	1,393	547	600		15,454	15,082	229	143	620	499	260	240	298
1987	27,968	10,792	3,366	4,037	623	1,643	531	593		15,566	15,153	260	153	707	569	294	276	333
1988	29,621	10,766	3,362	3,846	371	1,957	565	599	66	17,002	16,531	302	169	818	659	334	325	377
1989	32,381	11,754	3,566	4,324	374	2,120	605	695	70	18,529	17,993	347	189	933	747	377	370	417
1990	35,095	13,772	3,652	5,967	386	2,139	767	780	81	19,018	18,432	378	209	1,032	820	416	404	453
1991	38,764	14,281	4,093	5,588	433	2,230	929	921	86	22,044	21,425	392	227	1,091	881	452	428	468
1992	38,066	13,693	4,337	4,476	507	2,413	946	933	81	21,838	21,184	415	239	1,120	937	482	455	479
1993	37,379	14,068	4,838	4,295	435	2,529	969	900	103	20,642	19,956	440	245	1,180	997	510	486	492
1994	36,689	13,799	5,003	3,616	503	2,625	980	960	112	20,085	19,372	459	254	1,255	1,039	532	507	511

Appendix table 2-13.
U.S. applied research expenditures, by source of funds and performer: 1953–98
(Millions of current dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Non-profit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1995	41,085	13,648	5,007	3,164	535	2,758	1,117	935	131	24,519	23,755	487	277	1,311	1,055	541	514	551
1996	43,156	13,964	4,874	3,640	231	2,854	1,284	960	122	26,187	25,370	514	303	1,358	1,076	557	519	571
1997	47,203	13,437	5,079	2,648	213	2,951	1,413	1,010	123	30,648	29,782	536	330	1,417	1,115	584	530	587
1998 prelim. ...	51,221	14,326	5,421	2,865	222	3,130	1,545	1,040	104	33,625	32,701	567	357	1,489	1,163	613	550	619

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]Because of limitations in the survey information, data on non-Federal government funding to other performers are not available, and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal government support to nonprofits is included in nonprofits' support for their own R&D.

[b]For 1953–63, applied research of industry FFRDCs were not separated out from total Federal support to the industrial sector for applied research. Thus, the figure for Federal support to industry for applied research includes support for applied research at industry FFRDCs for those years. The same is true for applied research by nonprofit FFRDCs in 1953–87, which is included in Federal support for applied research at nonprofit institutions for those years.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[e]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figures 2-16 and 2-17 in Volume I.

Appendix table 2-14.
U.S. applied research expenditures, by source of funds and performer: 1953–98
(Millions of constant 1992 dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Non-profit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1953	6,388	3,744	1,720	1,427		292	235	69		2,257	2,170	32	55	138	99	50	50	149
1954	6,752	3,846	1,614	1,578		292	284	78		2,511	2,411	37	64	137	103	54	49	154
1955	7,297	4,098	1,606	1,774		304	328	87		2,809	2,700	41	68	131	104	53	51	156
1956	8,978	4,772	1,800	2,208		303	366	95		3,810	3,698	47	65	125	116	65	51	154
1957	10,881	5,879	2,009	3,057		284	424	106		4,587	4,472	52	63	122	140	90	50	153
1958	12,144	6,587	2,272	3,408		288	487	132		5,121	5,007	53	62	120	161	110	51	155
1959	12,808	7,102	2,512	3,542		338	525	185		5,253	5,133	54	65	122	170	118	52	161
1960	13,171	7,441	2,641	3,580		400	552	269		5,269	5,140	56	73	124	172	120	52	166
1961	13,267	7,693	2,838	3,449		440	616	350		5,076	4,949	55	72	126	202	149	53	170
1962	15,510	8,800	2,972	4,241		497	682	409		6,168	6,032	57	80	128	243	189	55	170
1963	16,022	9,306	3,354	4,175		529	771	477		6,148	6,012	58	79	134	259	203	56	175
1964	17,161	10,055	3,866	3,995	253	580	829	531		6,505	6,373	55	78	152	263	192	71	185
1965	17,522	10,226	3,980	3,974	184	703	823	561		6,627	6,490	52	84	169	315	208	106	186
1966	18,124	10,224	3,942	3,841	206	810	830	594		7,176	7,028	55	93	189	353	222	131	183
1967	18,301	10,430	4,034	3,711	313	897	849	627		7,133	6,980	59	94	203	362	227	136	172
1968	18,585	10,168	4,021	3,459	315	903	798	673		7,688	7,529	58	101	199	364	224	139	166
1969	18,847	10,103	4,248	3,179	328	886	736	726		8,017	7,851	55	111	186	375	228	147	166
1970	18,873	10,172	4,377	3,123	318	917	699	738		7,968	7,802	57	108	183	382	230	153	168
1971	18,194	9,641	4,226	2,829	209	954	672	750		7,778	7,614	58	106	209	377	231	147	189
1972	18,393	9,704	4,291	2,528	320	1,168	670	726		7,832	7,666	61	105	245	390	236	154	222
1973	18,854	9,715	4,327	2,501	312	1,273	574	728		8,198	8,023	74	102	283	409	235	174	248
1974	19,099	9,447	4,295	2,352	312	1,239	495	754		8,668	8,482	82	104	306	428	242	186	250
1975	19,239	9,801	4,542	2,354	330	1,306	520	748		8,367	8,173	91	102	334	468	249	219	269
1976	20,180	10,020	4,643	2,319	375	1,337	589	758		8,989	8,781	100	108	372	514	269	245	286
1977	20,429	9,889	4,387	2,347	447	1,319	642	748		9,308	9,089	108	112	409	539	285	254	284
1978	21,087	9,993	4,405	2,348	462	1,328	647	803		9,797	9,570	119	108	455	545	295	251	297
1979	21,995	10,181	4,373	2,363	453	1,435	688	869		10,504	10,266	129	109	476	541	308	233	292
1980	22,829	10,389	4,220	2,694	456	1,512	698	810		11,111	10,857	146	108	511	531	298	232	288
1981	24,876	10,557	4,138	3,093	451	1,443	642	790		12,940	12,663	163	114	549	528	288	240	302
1982	26,084	11,055	3,993	3,695	523	1,434	626	784		13,637	13,343	172	121	573	524	271	253	296
1983	27,895	12,074	4,089	4,411	566	1,534	675	800		14,382	14,060	193	130	606	539	273	265	294
1984	29,689	12,600	3,900	4,843	720	1,615	739	782		15,567	15,202	221	145	647	566	287	279	308
1985	32,391	13,922	3,992	6,007	802	1,651	730	740		16,851	16,437	252	163	697	588	302	285	333
1986	33,870	12,933	3,976	5,025	781	1,729	678	745		19,178	18,717	284	177	769	620	322	297	369
1987	33,671	12,993	4,052	4,860	750	1,978	639	714		18,740	18,243	313	184	852	686	353	332	401
1988	34,407	12,505	3,905	4,467	431	2,274	656	695	76	19,749	19,202	351	196	950	765	388	377	438
1989	36,091	13,101	3,975	4,819	417	2,363	675	774	78	20,653	20,055	387	211	1,040	832	420	413	465
1990	37,495	14,714	3,902	6,375	412	2,285	819	833	87	20,319	19,692	404	223	1,102	877	444	432	484
1991	39,832	14,674	4,206	5,742	445	2,291	955	946	89	22,651	22,015	403	233	1,121	905	465	440	481
1992	38,066	13,693	4,337	4,476	507	2,413	946	933	81	21,838	21,184	415	239	1,120	937	482	455	479
1993	36,417	13,706	4,714	4,185	424	2,464	944	876	100	20,111	19,443	429	239	1,150	971	497	474	479

Appendix table 2-14.
U.S. applied research expenditures, by source of funds and performer: 1953–98
(Millions of constant 1992 dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Non-profit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1994	34,912	13,131	4,761	3,441	479	2,498	933	913	106	19,112	18,434	437	242	1,195	989	506	482	486
1995	38,215	12,695	4,657	2,943	498	2,566	1,039	870	122	22,807	22,096	453	258	1,219	982	503	478	513
1996	39,401	12,749	4,450	3,323	211	2,606	1,172	876	111	23,908	23,163	469	277	1,240	982	508	474	521
1997	42,308	12,043	4,552	2,373	191	2,645	1,266	906	110	27,469	26,694	480	295	1,270	999	524	475	526
1998 .... prelim.	45,449	12,712	4,810	2,542	197	2,777	1,371	923	92	29,836	29,016	503	317	1,321	1,032	544	488	549

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]Because of limitations in the survey information, data on non-Federal government funding to other performers are not available, and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal government support to nonprofits is included in nonprofits' support for their own R&D.

[b]For 1953-63, applied research of industry FFRDCs were not separated out from total Federal support to the industrial sector for applied research. Thus, the figure for Federal support to industry for applied research includes support for applied research at industry FFRDCs for those years. The same is true for applied research by nonprofit FFRDCs in 1953-87, which is included in Federal support for applied research at nonprofit institutions for those years.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[e]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

Appendix table 2-15.

U.S. development expenditures, by performing sector and source of funds: 1953–98

(Millions of current dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Non-Fed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1953	3,412	567	2,753	1,123	1,630		16	9	3	1	3	1	48	29	17	6	6	
1954	3,734	537	3,090	1,405	1,685		17	9	3	1	3	1	59	32	18	7	7	
1955	4,189	543	3,523	1,785	1,738		21	12	4	2	3	1	69	34	19	8	7	
1956	5,855	631	5,084	2,817	2,267		25	14	4	2	4	2	81	35	20	8	7	
1957	6,681	728	5,790	3,616	2,174		26	12	5	3	4	2	101	37	21	8	8	
1958	7,214	842	6,183	3,942	2,241		28	13	6	3	4	2	120	42	25	8	9	
1959	8,463	940	7,307	4,750	2,557		31	16	6	3	5	2	134	51	32	9	10	
1960	9,360	1,003	8,104	5,169	2,935		35	19	6	3	5	2	151	69	49	10	10	
1961	9,930	1,090	8,536	5,347	3,189		38	22	7	2	5	2	170	97	73	10	14	
1962	10,116	1,227	8,527	5,281	3,246		40	23	8	2	6	2	190	132	103	11	18	
1963	11,540	1,465	9,651	6,116	3,535		40	22	8	2	6	2	219	165	134	11	20	
1964	12,506	1,680	10,004	6,156	3,848	359	49	30	8	2	7	3	227	188	159	11	18	
1965	13,215	1,789	10,637	6,218	4,419	298	71	48	9	2	8	4	207	215	183	12	20	
1966	14,490	1,886	11,810	6,849	4,961	271	87	61	9	2	10	5	200	236	199	14	23	
1967	15,332	1,943	12,539	6,795	5,744	302	93	66	9	3	10	7	208	247	208	15	24	
1968	16,154	1,904	13,370	7,044	6,326	293	102	72	8	4	9	9	226	259	217	16	26	
1969	17,051	2,016	14,071	6,944	7,127	332	110	80	7	5	8	10	246	277	231	18	28	
1970	16,925	2,258	13,698	6,232	7,466	340	112	84	6	5	7	10	249	268	220	18	30	
1971	17,399	2,473	13,924	6,167	7,757	391	98	69	8	4	9	9	267	246	194	19	33	
1972	18,743	2,639	15,043	6,533	8,510	402	101	63	12	4	14	9	291	267	213	19	35	
1973	20,197	2,657	16,394	6,621	9,773	399	126	71	18	5	20	13	296	326	268	20	38	
1974	21,503	2,765	17,421	6,553	10,868	479	141	75	20	7	25	15	321	377	314	21	42	
1975	22,708	2,890	18,352	6,783	11,569	535	156	83	22	8	27	16	373	403	330	22	51	
1976	25,092	2,972	20,412	7,522	12,890	654	182	100	24	12	31	16	447	425	341	23	61	
1977	27,691	3,188	22,603	8,275	14,328	675	254	153	28	15	40	19	513	459	359	27	73	
1978	31,090	3,676	25,216	8,756	16,460	753	373	254	32	15	49	24	552	520	403	30	87	
1979	35,506	3,944	29,033	9,888	19,145	810	469	336	34	16	56	28	633	617	483	35	99	
1980	40,734	4,072	33,848	10,957	22,891	882	518	362	38	19	68	31	744	670	525	40	105	
1981	46,059	4,530	38,547	12,791	25,756	950	568	386	44	24	80	35	761	704	549	45	110	
1982	51,730	5,178	43,434	14,215	29,219	989	597	397	46	27	88	39	763	769	599	50	120	
1983	57,603	6,106	48,064	15,522	32,542	1,054	617	399	47	31	97	43	862	900	715	55	130	
1984	66,365	7,078	55,371	17,640	37,731	1,056	677	435	51	37	108	47	1,048	1,135	925	65	145	
1985	74,538	8,011	62,020	20,258	41,762	1,102	756	486	57	43	120	49	1,315	1,334	1,100	75	158	
1986	75,853	8,275	62,871	21,517	41,354	1,145	818	513	65	50	136	53	1,549	1,195	938	84	173	
1987	79,894	8,176	66,789	24,122	42,667	1,230	945	599	73	57	155	61	1,699	1,056	771	90	196	
1988	84,646	8,864	70,353	23,719	46,634	1,414	1,098	698	83	66	179	71	1,767	729	407	99	223	420
1989	87,816	9,355	72,725	21,049	51,676	1,423	1,227	773	92	76	205	81	1,786	869	507	111	251	430
1990	94,107	9,700	78,376	18,966	59,410	1,438	1,407	909	99	83	226	89	1,677	1,019	619	123	277	490
1991	95,184	8,778	80,286	17,256	63,030	1,383	1,533	1,011	103	86	239	94	1,514	1,157	722	134	302	533
1992	99,889	9,098	84,569	17,181	67,388	1,373	1,595	1,054	105	91	246	100	1,435	1,220	758	141	321	599
1993	99,751	9,071	84,757	16,083	68,674	1,039	1,692	1,122	108	97	259	107	1,346	1,271	787	144	340	574

Appendix table 2-15.

U.S. development expenditures, by performing sector and source of funds: 1953–98

(Millions of current dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Non-Fed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1994	103,119	8,876	87,890	16,209	71,681	1,196	1,798	1,198	112	101	276	111	1,467	1,319	815	149	355	573
1995	113,239	9,431	97,342	17,824	79,518	1,209	1,792	1,163	121	107	288	113	1,593	1,266	743	163	361	606
1996	121,372	9,064	105,863	17,066	88,797	1,358	1,775	1,125	125	113	298	114	1,495	1,247	697	178	371	570
1997	128,565	9,001	113,184	18,121	95,063	1,292	1,837	1,163	129	118	311	116	1,357	1,291	708	194	389	603
1998 .... prelim.	138,075	8,848	122,591	18,211	104,380	1,475	1,888	1,181	136	124	327	121	1,251	1,413	794	210	408	608

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]For 1953-63, development expenditures of industry FFRDCs were not separated out from total Federal support to the industrial sector for development. Thus, the figure for Federal support to industry for development expenditures includes support for development at industry FFRDCs for those years. The same is true for development by nonprofit FFRDCs in 1953-87, which is included in Federal support for development at nonprofit institutions for those years.

[b]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar-year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS) *Nationl Patterns of R&D Resources* (Arlington, VA: biennial series).

See figures 2-2, 2-15, and 2-16 and text table 2-1 in Volume I.

Appendix table 2-16.

U.S. development expenditures, by performing sector and source of funds: 1953–98

(Millions of constant 1992 dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Non-Fed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1953	16,905	2,807	13,642	5,565	8,077		79	42	14	5	13	5	235	141	82	30	30	
1954	18,295	2,631	15,140	6,884	8,256		83	42	17	5	15	5	287	154	86	34	34	
1955	20,198	2,616	16,986	8,607	8,380		101	55	18	7	15	5	333	162	89	39	34	
1956	27,268	2,937	23,680	13,121	10,559		116	63	21	9	17	7	375	161	91	37	33	
1957	30,122	3,280	26,105	16,303	9,802		117	54	24	11	19	9	455	165	92	36	36	
1958	31,764	3,705	27,226	17,358	9,868		121	55	25	13	19	9	528	183	108	35	40	
1959	36,876	4,096	31,839	20,697	11,142		135	68	26	13	20	9	584	222	139	39	44	
1960	40,223	4,308	34,826	22,213	12,613		148	82	27	11	20	9	647	294	208	43	43	
1961	42,181	4,628	36,262	22,715	13,547		159	91	29	8	22	8	720	412	310	42	59	
1962	42,431	5,147	35,768	22,152	13,616		168	94	32	8	24	8	797	552	430	46	76	
1963	47,842	6,074	40,012	25,357	14,656		166	91	33	8	25	8	906	684	556	46	83	
1964	51,087	6,863	40,866	25,147	15,719	1,467	198	121	32	8	27	10	925	768	650	45	74	
1965	52,945	7,165	42,616	24,912	17,704	1,194	282	192	35	8	32	16	827	859	731	48	80	
1966	56,445	7,347	46,007	26,681	19,326	1,056	339	238	37	8	38	19	779	917	773	55	90	
1967	57,877	7,335	47,335	25,651	21,684	1,140	351	247	32	9	38	25	785	931	783	57	91	
1968	58,442	6,889	48,372	25,485	22,887	1,060	367	259	28	14	34	33	818	937	785	58	94	
1969	58,917	6,965	48,621	23,994	24,627	1,147	378	275	24	17	27	35	850	955	796	62	97	
1970	55,528	7,408	44,941	20,446	24,495	1,115	367	274	21	16	23	33	817	879	722	59	98	
1971	54,269	7,712	43,431	19,236	24,195	1,220	306	215	24	12	27	27	833	767	605	59	103	
1972	56,084	7,897	45,012	19,548	25,464	1,203	302	187	37	10	41	27	871	799	637	57	105	
1973	57,214	7,527	46,442	18,756	27,686	1,130	356	200	50	14	57	35	837	922	758	57	108	
1974	55,897	7,189	45,285	17,034	28,251	1,245	365	194	52	17	64	39	834	979	815	55	109	
1975	53,952	6,866	43,602	16,115	27,486	1,271	371	196	53	19	65	38	885	957	784	52	121	
1976	56,323	6,671	45,818	16,884	28,934	1,468	409	223	54	26	70	36	1,003	954	765	52	137	
1977	58,384	6,721	47,655	17,447	30,209	1,423	536	323	59	31	85	39	1,081	968	757	57	154	
1978	61,092	7,224	49,550	17,206	32,344	1,480	732	499	63	28	96	46	1,085	1,021	791	59	171	
1979	64,288	7,141	52,567	17,903	34,664	1,467	850	609	62	28	101	50	1,147	1,116	874	63	179	
1980	67,519	6,750	56,105	18,162	37,943	1,462	858	600	63	32	112	51	1,233	1,111	870	66	174	
1981	69,776	6,863	58,396	19,377	39,018	1,439	860	585	66	36	121	53	1,152	1,066	831	68	167	
1982	73,721	7,379	61,898	20,258	41,640	1,409	851	566	65	38	126	56	1,088	1,096	853	71	171	
1983	78,736	8,346	65,697	21,217	44,481	1,441	844	546	64	42	133	58	1,179	1,230	977	75	178	
1984	87,415	9,323	72,933	23,235	49,698	1,391	892	573	68	49	142	61	1,381	1,495	1,218	85	191	
1985	94,916	10,201	78,976	25,797	53,180	1,403	963	619	73	55	153	63	1,675	1,698	1,401	96	202	
1986	94,133	10,269	78,023	26,703	51,320	1,421	1,015	637	81	62	169	65	1,923	1,483	1,163	104	215	
1987	96,189	9,843	80,411	29,042	51,369	1,481	1,137	721	88	69	187	73	2,045	1,272	928	108	236	
1988	98,322	10,296	81,720	27,551	54,169	1,642	1,275	811	96	77	208	83	2,053	847	473	115	259	488
1989	97,878	10,427	81,058	23,461	57,597	1,586	1,368	862	102	85	228	91	1,990	969	565	124	280	480
1990	100,542	10,364	83,735	20,263	63,472	1,536	1,503	972	106	89	242	95	1,791	1,089	661	131	296	524
1991	97,805	9,019	82,497	17,731	64,766	1,421	1,575	1,039	105	88	246	97	1,556	1,189	742	137	310	547
1992	99,889	9,098	84,569	17,181	67,388	1,373	1,595	1,054	105	91	246	100	1,435	1,220	758	141	321	599
1993	97,186	8,838	82,577	15,669	66,908	1,012	1,649	1,093	105	94	252	104	1,312	1,238	766	141	332	560

Appendix table 2-16.
U.S. development expenditures, by performing sector and source of funds: 1953–98
(Millions of constant 1992 dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Non-Fed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1994	98,125	8,446	83,633	15,424	68,209	1,138	1,711	1,140	107	96	262	106	1,396	1,255	775	142	338	546
1995	105,329	8,772	90,542	16,579	73,963	1,125	1,667	1,082	113	100	268	105	1,482	1,178	691	151	335	563
1996	110,811	8,276	96,652	15,581	81,071	1,240	1,621	1,027	114	103	272	104	1,365	1,138	637	163	339	520
1997	115,233	8,068	101,447	16,242	85,205	1,158	1,646	1,042	115	105	279	104	1,217	1,157	635	174	349	540
1998 .... prelim.	122,516	7,851	108,776	16,159	92,618	1,309	1,676	1,048	121	110	290	107	1,110	1,254	705	186	362	540

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]For 1953-63, development expenditures of industry FFRDCs were not separated out from total Federal support to the industrial sector for development. Thus, the figure for Federal support to industry for development expenditures includes support for development at industry FFRDCs for those years. The same is true for development by nonprofit FFRDCs in 1953-87, which is included in Federal support for development at nonprofit institutions for those years.

[b]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar-year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figures 2-15 and 2-16 in Volume I.

Appendix table 2-17.
U.S. development expenditures, by source of funds and performer: 1953–98
(Millions of current dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Non-profit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1953	3,412	1,762	567	1,123		9	48	17		1,637	1,630	1	6	3	7	6	1	3
1954	3,734	2,027	537	1,405		9	59	18		1,693	1,685	1	7	3	8	7	1	3
1955	4,189	2,427	543	1,785		12	69	19		1,748	1,738	2	8	3	8	7	1	4
1956	5,855	3,561	631	2,817		14	81	20		2,277	2,267	2	8	4	9	7	2	4
1957	6,681	4,477	728	3,616		12	101	21		2,185	2,174	3	8	4	10	8	2	5
1958	7,214	4,941	842	3,942		13	120	25		2,252	2,241	3	8	4	11	9	2	6
1959	8,463	5,872	940	4,750		16	134	32		2,569	2,557	3	9	5	12	10	2	6
1960	9,360	6,390	1,003	5,169		19	151	49		2,948	2,935	3	10	5	12	10	2	6
1961	9,930	6,701	1,090	5,347		22	170	73		3,201	3,189	2	10	5	16	14	2	7
1962	10,116	6,823	1,227	5,281		23	190	103		3,259	3,246	2	11	6	20	18	2	8
1963	11,540	7,956	1,465	6,116		22	219	134		3,548	3,535	2	11	6	22	20	2	8
1964	12,506	8,610	1,680	6,156	359	30	227	159		3,861	3,848	2	11	7	21	18	3	8
1965	13,215	8,742	1,789	6,218	298	48	207	183		4,433	4,419	2	12	8	24	20	4	9
1966	14,490	9,466	1,886	6,849	271	61	200	199		4,977	4,961	2	14	10	28	23	5	9
1967	15,332	9,521	1,943	6,795	302	66	208	208		5,762	5,744	3	15	10	31	24	7	9
1968	16,154	9,756	1,904	7,044	293	72	226	217		6,346	6,326	4	16	9	35	26	9	8
1969	17,051	9,848	2,016	6,944	332	80	246	231		7,150	7,127	5	18	8	38	28	10	7
1970	16,925	9,382	2,258	6,232	340	84	249	220		7,489	7,466	5	18	7	40	30	10	6
1971	17,399	9,561	2,473	6,167	391	69	267	194		7,780	7,757	4	19	9	42	33	9	8
1972	18,743	10,141	2,639	6,533	402	63	291	213		8,533	8,510	4	19	14	44	35	9	12
1973	20,197	10,311	2,657	6,621	399	71	296	268		9,798	9,773	5	20	20	51	38	13	18
1974	21,503	10,506	2,765	6,553	479	75	321	314		10,896	10,868	7	21	25	57	42	15	20
1975	22,708	10,993	2,890	6,783	535	83	373	330		11,599	11,569	8	22	27	67	51	16	22
1976	25,092	12,035	2,972	7,522	654	100	447	341		12,925	12,890	12	23	31	77	61	16	24
1977	27,691	13,162	3,188	8,275	675	153	513	359		14,370	14,328	15	27	40	92	73	19	28
1978	31,090	14,394	3,676	8,756	753	254	552	403		16,505	16,460	15	30	49	111	87	24	32
1979	35,506	16,094	3,944	9,888	810	336	633	483		19,196	19,145	16	35	56	127	99	28	34
1980	40,734	17,542	4,072	10,957	882	362	744	525		22,950	22,891	19	40	68	136	105	31	38
1981	46,059	19,967	4,530	12,791	950	386	761	549		25,825	25,756	24	45	80	145	110	35	44
1982	51,730	22,142	5,178	14,215	989	397	763	599		29,296	29,219	27	50	88	159	120	39	46
1983	57,603	24,658	6,106	15,522	1,054	399	862	715		32,628	32,542	31	55	97	173	130	43	47
1984	66,365	28,182	7,078	17,640	1,056	435	1,048	925		37,833	37,731	37	65	108	192	145	47	51
1985	74,538	32,272	8,011	20,258	1,102	486	1,315	1,100		41,881	41,762	43	75	120	207	158	49	57
1986	75,853	33,937	8,275	21,517	1,145	513	1,549	938		41,488	41,354	50	84	136	226	173	53	65
1987	79,894	36,596	8,176	24,122	1,230	599	1,699	771		42,814	42,667	57	90	155	256	196	61	73
1988	84,646	37,290	8,864	23,719	1,414	698	1,767	407	420	46,800	46,634	66	99	179	294	223	71	83
1989	87,816	35,324	9,355	21,049	1,423	773	1,786	507	430	51,863	51,676	76	111	205	332	251	81	92
1990	94,107	33,799	9,700	18,966	1,438	909	1,677	619	490	59,616	59,410	83	123	226	366	277	89	99
1991	95,184	31,197	8,778	17,256	1,383	1,011	1,514	722	533	63,250	63,030	86	134	239	396	302	94	103
1992	99,889	31,498	9,098	17,181	1,373	1,054	1,435	758	599	67,620	67,388	91	141	246	421	321	100	105
1993	99,751	30,022	9,071	16,083	1,039	1,122	1,346	787	574	68,915	68,674	97	144	259	447	340	107	108

Appendix table 2-17.
U.S. development expenditures, by source of funds and performer: 1953–98
(Millions of current dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Non-profit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1994	103,119	30,334	8,876	16,209	1,196	1,198	1,467	815	573	71,931	71,681	101	149	276	466	355	111	112
1995	113,239	32,569	9,431	17,824	1,209	1,163	1,593	743	606	79,788	79,518	107	163	288	473	361	113	121
1996	121,372	31,375	9,064	17,066	1,358	1,125	1,495	697	570	89,088	88,797	113	178	298	485	371	114	125
1997	128,565	32,245	9,001	18,121	1,292	1,163	1,357	708	603	95,375	95,063	118	194	311	506	389	116	129
1998 .... prelim.	138,075	32,369	8,848	18,211	1,475	1,181	1,251	794	608	104,715	104,380	124	210	327	529	408	121	136

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]Because of limitations in the survey information, data on non-Federal government funding to other performers are not available, and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal government support to nonprofits is included in nonprofits' support for their own R&D.

[b]For 1953-63, development expenditures of industry FFRDCs were not separated out from total Federal support to the industrial sector for development. Thus, the figure for Federal support to industry for development expenditures includes support for development at industry FFRDCs for those years. The same is true for development by nonprofit FFRDCs in 1953-87, which is included in Federal support for development at nonprofit institutions for those years.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[e]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figures 2-16 and 2-17 in Volume I.

Appendix table 2-18.
U.S. development expenditures, by source of funds and performer: 1953–98
(Millions of constant 1992 dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Non-profit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1953	16,905	8,731	2,807	5,565		42	235	82		8,112	8,077	5	30	13	35	30	5	14
1954	18,295	9,929	2,631	6,884		42	287	86		8,295	8,256	5	34	15	39	34	5	17
1955	20,198	11,700	2,616	8,607		55	333	89		8,426	8,380	7	39	15	39	34	5	18
1956	27,268	16,586	2,937	13,121		63	375	91		10,605	10,559	9	37	17	40	33	7	21
1957	30,122	20,185	3,280	16,303		54	455	92		9,849	9,802	11	36	19	45	36	9	24
1958	31,764	21,755	3,705	17,358		55	528	108		9,916	9,868	13	35	19	48	40	9	25
1959	36,876	25,584	4,096	20,697		68	584	139		11,194	11,142	13	39	20	52	44	9	26
1960	40,223	27,458	4,308	22,213		82	647	208		12,667	12,613	11	43	20	52	43	9	27
1961	42,181	28,464	4,628	22,715		91	720	310		13,598	13,547	8	42	22	68	59	8	29
1962	42,431	28,620	5,147	22,152		94	797	430		13,670	13,616	8	46	24	84	76	8	32
1963	47,842	32,983	6,074	25,357		91	906	556		14,710	14,656	8	46	25	91	83	8	33
1964	51,087	35,172	6,863	25,147	1,467	121	925	650		15,772	15,719	8	45	27	84	74	10	32
1965	52,945	35,022	7,165	24,912	1,194	192	827	731		17,760	17,704	8	48	32	96	80	16	35
1966	56,445	36,874	7,347	26,681	1,056	238	779	773		19,388	19,326	8	55	38	109	90	19	37
1967	57,877	35,942	7,335	25,651	1,140	247	785	783		21,750	21,684	9	57	38	115	91	25	32
1968	58,442	35,295	6,889	25,485	1,060	259	818	785		22,959	22,887	14	58	34	127	94	33	28
1969	58,917	34,028	6,965	23,994	1,147	275	850	796		24,706	24,627	17	62	27	131	97	35	24
1970	55,528	30,782	7,408	20,446	1,115	274	817	722		24,570	24,495	16	59	23	131	98	33	21
1971	54,269	29,821	7,712	19,236	1,220	215	833	605		24,267	24,195	12	59	27	129	103	27	24
1972	56,084	30,343	7,897	19,548	1,203	187	871	637		25,531	25,464	10	57	41	132	105	27	37
1973	57,214	29,209	7,527	18,756	1,130	200	837	758		27,756	27,686	14	57	57	143	108	35	50
1974	55,897	27,311	7,189	17,034	1,245	194	834	815		28,322	28,251	17	55	64	148	109	39	52
1975	53,952	26,118	6,866	16,115	1,271	196	885	784		27,558	27,486	19	52	65	159	121	38	53
1976	56,323	27,015	6,671	16,884	1,468	223	1,003	765		29,011	28,934	26	52	70	173	137	36	54
1977	58,384	27,751	6,721	17,447	1,423	323	1,081	757		30,296	30,209	31	57	85	193	154	39	59
1978	61,092	28,284	7,224	17,206	1,480	499	1,085	791		32,432	32,344	28	59	96	217	171	46	63
1979	64,288	29,140	7,141	17,903	1,467	609	1,147	874		34,756	34,664	28	63	101	229	179	50	62
1980	67,519	29,077	6,750	18,162	1,462	600	1,233	870		38,041	37,943	32	66	112	225	174	51	63
1981	69,776	30,248	6,863	19,377	1,439	585	1,152	831		39,122	39,018	36	68	121	219	167	53	66
1982	73,721	31,554	7,379	20,258	1,409	566	1,088	853		41,749	41,640	38	71	126	227	171	56	65
1983	78,736	33,705	8,346	21,217	1,441	546	1,179	977		44,598	44,481	42	75	133	236	178	58	64
1984	87,415	37,121	9,323	23,235	1,391	573	1,381	1,218		49,832	49,698	49	85	142	252	191	61	68
1985	94,916	41,095	10,201	25,797	1,403	619	1,675	1,401		53,331	53,180	55	96	153	264	202	63	73
1986	94,133	42,116	10,269	26,703	1,421	637	1,923	1,163		51,487	51,320	62	104	169	280	215	65	81
1987	96,189	44,059	9,843	29,042	1,481	721	2,045	928		51,546	51,369	69	108	187	309	236	73	88
1988	98,322	43,315	10,296	27,551	1,642	811	2,053	473	488	54,361	54,169	77	115	208	341	259	83	96
1989	97,878	39,371	10,427	23,461	1,586	862	1,990	565	480	57,806	57,597	85	124	228	370	280	91	102
1990	100,542	36,110	10,364	20,263	1,536	972	1,791	661	524	63,692	63,472	89	131	242	391	296	95	106
1991	97,805	32,056	9,019	17,731	1,421	1,039	1,556	742	547	64,991	64,766	88	137	246	406	310	97	105
1992	99,889	31,498	9,098	17,181	1,373	1,054	1,435	758	599	67,620	67,388	91	141	246	421	321	100	105
1993	97,186	29,250	8,838	15,669	1,012	1,093	1,312	766	560	67,142	66,908	94	141	252	436	332	104	105

Appendix table 2-18.
U.S. development expenditures, by source of funds and performer: 1953–98
(Millions of constant 1992 dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Non-profit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1994	98,125	28,865	8,446	15,424	1,138	1,140	1,396	775	546	68,447	68,209	96	142	262	443	338	106	107
1995	105,329	30,294	8,772	16,579	1,125	1,082	1,482	691	563	74,214	73,963	100	151	268	440	335	105	113
1996	110,811	28,645	8,276	15,581	1,240	1,027	1,365	637	520	81,337	81,071	103	163	272	443	339	104	114
1997	115,233	28,901	8,068	16,242	1,158	1,042	1,217	635	540	85,484	85,205	105	174	279	453	349	104	115
1998 .... prelim.	122,516	28,721	7,851	16,159	1,309	1,048	1,110	705	540	92,914	92,618	110	186	290	470	362	107	121

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges; NA = not available.

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]Because of limitations in the survey information, data on non-Federal government funding to other performers are not available, and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal government support to nonprofits is included in nonprofits' support for their own R&D.

[b]For 1953-63, development expenditures of industry FFRDCs were not separated out from total Federal support to the industrial sector for development. Thus, the figure for Federal support to industry for development includes support for development at industry FFRDCs for those years. The same is true for development by nonprofit FFRDCs in 1953-87, which is included in Federal support for development at nonprofit institutions for those years.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[e]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

Appendix table 2-19.
Trends in Federal and non–Federal R&D expenditures: 1953–98
(percent)

Calendar year	Non-Federal	Federal			
	Total nonfederal	Total federal	Defense related	Space related	Civilian related
1953	46.1	53.9	48.0	1.0	4.9
1954	44.8	55.2	49.0	1.0	5.2
1955	42.6	57.4	48.7	1.0	7.7
1956	41.4	58.6	49.7	1.0	7.9
1957	37.1	62.9	53.2	0.9	8.8
1958	36.1	63.9	53.1	1.1	9.7
1959	34.6	65.4	54.3	2.6	8.6
1960	35.0	65.0	52.6	3.2	9.3
1961	34.9	65.1	50.4	5.6	9.2
1962	35.2	64.8	45.6	9.1	10.2
1963	33.5	66.5	41.3	15.2	10.0
1964	33.2	66.8	36.8	20.1	10.0
1965	34.9	65.1	32.7	22.0	10.4
1966	35.8	64.2	31.6	21.1	11.5
1967	37.6	62.4	32.3	18.4	11.7
1968	39.3	60.7	31.5	16.9	12.3
1969	41.4	58.6	31.3	14.8	12.4
1970	43.0	57.0	29.7	14.1	13.2
1971	43.6	56.4	29.4	11.8	15.2
1972	44.2	55.8	30.1	10.7	15.0
1973	46.4	53.6	28.7	9.8	15.1
1974	48.2	51.8	26.8	8.9	16.1
1975	48.1	51.9	26.4	8.4	17.2
1976	48.6	51.4	25.8	8.5	17.1
1977	49.0	51.0	25.8	6.9	18.3
1978	49.9	50.1	24.9	6.5	18.8
1979	50.8	49.2	24.0	6.2	18.9
1980	52.6	47.4	23.8	5.1	18.5
1981	53.4	46.6	25.4	4.9	16.3
1982	53.9	46.1	28.1	3.9	14.0
1983	53.8	46.2	29.7	3.1	13.3
1984	54.5	45.5	30.2	3.0	12.3
1985	54.0	46.0	31.1	3.2	11.8
1986	54.5	45.5	31.5	3.0	10.9
1987	53.6	46.4	31.8	3.2	11.4
1988	55.1	44.9	30.5	3.4	11.0
1989	57.4	42.6	27.9	3.7	11.0
1990	59.4	40.6	25.4	4.2	11.0
1991	62.2	37.8	22.6	4.5	10.8
1992	63.1	36.9	21.6	4.3	11.0
1993	63.4	36.6	21.6	4.4	10.6
1994	63.9	36.1	19.9	4.4	11.7
1995	65.5	34.5	18.7	4.6	11.3
1996	67.7	32.3	17.7	4.1	10.5
1997	69.3	30.7	17.0	4.1	9.6
1998	70.5	29.5	16.0	4.0	9.5

NOTES: Data are preliminary for 1998. Details may not sum to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figure 2-5 in Volume I.

Appendix table 2-20.
State R&D expenditures, by performing sector and source of funds: 1997
(Millions of current dollars)

Performing sector:		Total R&D	Federal Govt.	Industry			Universities & colleges						U&C FFRDCs	Other nonprofit institutions[a]	Non-profit FFRDCs
Funding sector:		Total R&D	Federal Govt.	Total	Federal Govt.[b]	Industry[b]	Total	Federal Govt.	Non-Federal govt.	Industry	U&C	Nonprofits	Federal Govt.[c]	Federal Govt.	Federal Govt.
State	Rank														
United States, total		211,268	16,814	157,539	23,928	133,611	25,001	14,849	1,940	1,773	4,686	1,754	5,466	3,036	820
Alabama	25	1,637	660	589	189	399	369	231	5	30	85	18	0	19	0
Alaska	48	136	38	24	D	D	71	28	4	13	26	0	0	2	0
Arizona	21	2,410	144	1,854	677	1,177	377	198	10	19	137	13	29	6	0
Arkansas	45	272	49	118	D	D	102	35	29	8	24	6	0	2	0
California	1	41,670	1,454	34,011	5,977	28,034	2,979	2,028	129	160	440	221	2,549	474	203
Colorado	17	3,205	195	2,248	525	1,723	427	290	27	24	50	37	136	50	148
Connecticut	16	3,454	33	3,014	307	2,707	393	242	14	25	76	35	0	15	0
Delaware	31	1,089	10	1,009	8	1,001	65	32	3	3	20	7	0	4	0
District of Columbia	20	2,768	1,733	645	D	D	214	154	1	18	24	16	0	176	0
Florida	12	4,784	649	3,442	1,461	1,981	682	334	89	48	176	34	0	11	0
Georgia	22	2,272	225	1,273	212	1,062	766	347	69	73	252	24	0	7	0
Hawaii	44	275	54	87	55	32	120	72	28	6	13	0	0	13	0
Idaho	30	1,270	24	1,181	D	D	64	18	22	9	15	0	0	0	0
Illinois	8	8,034	77	6,248	163	6,085	930	530	54	50	220	75	725	54	0
Indiana	18	3,149	68	2,677	D	D	400	209	24	33	114	20	0	4	0
Iowa	34	980	29	578	D	D	342	162	53	24	84	19	28	3	0
Kansas	29	1,351	16	1,136	D	D	198	75	45	12	57	9	0	1	0
Kentucky	38	526	7	359	3	356	158	76	7	20	53	2	0	1	0
Louisiana	37	554	48	172	D	D	330	128	75	32	78	17	0	4	0
Maine	47	149	6	83	D	D	33	15	2	6	11	0	0	27	0
Maryland	10	7,395	4,569	1,425	456	970	1,242	927	81	40	114	80	0	155	4
Massachusetts	5	11,097	361	8,300	1,397	6,903	1,268	915	29	103	125	96	353	652	163
Michigan	2	13,991	108	13,009	121	12,888	842	454	51	57	206	75	0	32	0
Minnesota	15	3,605	35	3,116	362	2,754	363	200	51	24	54	34	0	92	0
Mississippi	41	370	165	73	D	D	125	62	29	9	14	10	0	7	0
Missouri	24	1,826	51	1,290	30	1,260	465	261	24	37	111	32	0	21	0
Montana	46	199	33	92	D	D	71	31	14	8	16	1	0	4	0

Appendix table 2-20.
State R&D expenditures, by performing sector and source of funds: 1997
(Millions of current dollars)

Performing sector:		Total R&D	Federal Govt.	Industry			Universities & colleges						U&C FFRDCs	Other nonprofit institutions[a]	Non-profit FFRDCs
Funding sector:		Total R&D	Federal Govt.	Total	Federal Govt.[b]	Industry[b]	Total	Federal Govt.	Non-Federal govt.	Industry	U&C	Nonprofits	Federal Govt.[c]	Federal Govt.	Federal Govt.
State	Rank														
Nebraska	43	275	24	71	D	D	176	60	47	14	49	5	0	5	0
Nevada	39	517	46	380	D	D	88	44	4	5	31	4	0	2	0
New Hampshire	35	799	37	652	D	D	108	67	8	5	15	12	0	2	0
New Jersey	4	12,067	459	11,069	117	10,952	462	224	37	26	140	35	59	16	2
New Mexico	19	3,028	366	1,310	D	D	219	145	15	10	42	7	1,122	10	0
New York	3	12,307	136	9,939	2,078	7,861	1,784	1,152	80	96	245	211	239	209	0
North Carolina	13	4,667	230	3,590	111	3,478	786	439	116	96	106	29	0	61	0
North Dakota	49	116	26	33	0	33	56	24	1	3	26	2	0	0	0
Ohio	11	7,145	681	5,608	604	5,004	764	418	70	83	144	49	0	92	0
Oklahoma	36	644	44	428	45	383	163	71	19	14	45	13	0	9	0
Oregon	27	1,520	90	1,102	28	1,075	291	195	32	10	36	18	0	37	0
Pennsylvania	7	8,209	151	6,609	672	5,937	1,241	808	42	139	183	70	32	175	0
Rhode Island	32	1,040	202	704	D	D	112	79	1	2	27	3	0	22	0
South Carolina	33	1,040	34	783	83	700	219	103	21	9	66	21	0	4	0
South Dakota	51	71	19	26	0	26	25	11	8	1	3	1	0	2	0
Tennessee	26	1,566	78	1,089	D	D	330	199	38	17	53	23	44	26	0
Texas	6	9,487	560	7,265	784	6,481	1,581	845	170	132	270	164	0	80	1
Utah	28	1,381	117	1,027	199	829	234	158	18	14	36	8	0	3	0
Vermont	42	314	7	246	D	D	60	34	3	5	11	6	0	1	0
Virginia	14	4,136	1,655	1,767	851	916	455	270	47	40	74	24	80	37	143
Washington	9	7,543	167	6,610	D	D	508	366	15	41	69	17	0	115	144
West Virginia	40	427	87	233	D	D	64	30	2	4	23	5	33	11	0
Wisconsin	23	2,256	43	1,707	29	1,678	497	284	41	19	98	56	0	9	0
Wyoming	50	87	9	28	0	28	48	15	6	2	24	1	0	2	0
Other/unknown		12,161	704	7,210	6,384	18,898	1,338	753	129	92	276	87	38	269	11

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges; D = data have been withheld to avoid disclosing information about individual companies

NOTES: Data are based on annual reports by performers, except for the nonprofit sector. Details may not sum to totals because of rounding.

[a]State data for nonprofit performance using non-Federal funds are not available. For 1997, total nonprofit performance is estimated at $5,628 million. Industry provided an estimated $969 million to the nonprofit sector, and nonprofit institutions provided an estimated $1,623 million. These non-Federal–support amounts are included in the total R&D column for the rows "total United States" and "other/unknown". This is why, for these two colums, the amounts under "total R&D" are greater than the sum of the components to the right, since those components do not include nonfederal support to nonprofit organizations.

[b]Federal support for industry R&D includes performance at industry FFRDCs; industry support of industry R&D includes all non-Federal sources.

[c]Includes total R&D expenditures of FFRDCs administered by academic institutions.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Research and Development in Industry: 1997* (Arlington, VA: 1998, forthcoming); NSF/SRS, *Academic Research and Developmnent Expenditures: Fiscal Year 1997*, Detailed Statistical Tables (Arlington, VA: 1998, forthcoming); and NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999, Detailed Statistical Tables*, NSF 99–333 (Arlington, VA: 1999).

See figure 2-14 in Volume I.

Appendix table 2-21.
Total R&D and GSP, by state: 1997

Rank in total R&D	State	(Millions of dollars) Total R&D	GSP	Percent R&D/GSP	Rank in R&D/GSP	Percent of U.S. R&D	Cumulative percent of U.S. R&D
TOTAL, U.S		211,268					
1	California	41,670	1,033,016	4.03	9	19.72	19.7
2	Michigan	13,991	272,607	5.13	3	6.62	26.3
3	New York	12,307	651,652	1.89	25	5.83	32.2
4	New Jersey	12,067	294,055	4.10	8	5.71	37.9
5	Massachusetts	11,097	221,009	5.02	4	5.25	43.1
6	Texas	9,487	601,643	1.58	28	4.49	47.6
7	Pennsylvania	8,209	339,940	2.41	15	3.89	51.5
8	Illinois	8,034	393,532	2.04	21	3.80	55.3
9	Washington	7,543	172,253	4.38	6	3.57	58.9
10	Maryland	7,395	153,797	4.81	5	3.50	62.4
11	Ohio	7,145	320,506	2.23	17	3.38	65.8
12	Florida	4,784	380,607	1.26	31	2.26	68.0
13	North Carolina	4,667	218,888	2.13	18	2.21	70.2
14	Virginia	4,136	211,331	1.96	23	1.96	72.2
15	Minnesota	3,605	149,394	2.41	16	1.71	73.9
16	Connecticut	3,454	134,565	2.57	12	1.63	75.5
17	Colorado	3,205	126,084	2.54	13	1.52	77.1
18	Indiana	3,149	161,701	1.95	24	1.49	78.5
19	New Mexico	3,028	45,242	6.69	1	1.43	80.0
20	District of Columbia	2,768	52,372	5.29	2	1.31	81.3
21	Arizona	2,410	121,239	1.99	22	1.14	82.4
22	Georgia	2,272	229,473	0.99	38	1.08	83.5
23	Wisconsin	2,256	147,325	1.53	30	1.07	84.6
24	Missouri	1,826	152,100	1.20	33	0.86	85.4
25	Alabama	1,637	103,109	1.59	27	0.77	86.2
26	Tennessee	1,566	146,999	1.07	36	0.74	87.0
27	Oregon	1,520	98,367	1.54	29	0.72	87.7
28	Utah	1,381	55,417	2.49	14	0.65	88.3
29	Kansas	1,351	71,737	1.88	26	0.64	89.0
30	Idaho	1,270	29,149	4.36	7	0.60	89.6
31	Delaware	1,089	31,585	3.45	11	0.52	90.1
32	Rhode Island	1,040	27,806	3.74	10	0.49	90.6
33	South Carolina	1,040	93,259	1.11	35	0.49	91.1
34	Iowa	980	80,479	1.22	32	0.46	91.5
35	New Hampshire	799	38,106	2.10	19	0.38	91.9
36	Oklahoma	644	76,642	0.84	40	0.30	92.2
37	Louisiana	554	124,350	0.45	50	0.26	92.5
38	Kentucky	526	100,076	0.53	46	0.25	92.7
39	Nevada	517	57,407	0.90	39	0.24	93.0
40	West Virginia	427	38,228	1.12	34	0.20	93.2

Appendix table 2-21.
Total R&D and GSP, by state: 1997

Rank in total R&D	State	(Millions of dollars) Total R&D	GSP	Percent R&D/GSP	Rank in R&D/GSP	Percent of U.S. R&D	Cumulative percent of U.S. R&D
41	Mississippi	370	58,314	0.63	43	0.17	93.3
42	Vermont	314	15,214	2.06	20	0.15	93.5
43	Nebraska	275	48,812	0.56	44	0.13	93.6
44	Hawaii	275	38,024	0.72	42	0.13	93.8
45	Arkansas	272	58,479	0.46	49	0.13	93.9
46	Montana	199	19,160	1.04	37	0.09	94.0
47	Maine	149	30,156	0.49	48	0.07	94.0
48	Alaska	136	24,494	0.55	45	0.06	94.1
49	North Dakota	116	15,786	0.73	41	0.05	94.2
50	Wyoming	87	17,561	0.50	47	0.04	94.2
51	South Dakota	71	20,186	0.35	51	0.03	94.2
Other/unknown[a]		12,161				5.76	100.0

GSP = gross state product

[a]The "other/unknown" category includes R&D performed within the 50 states, or the District of Columbia, but where the specific location of such performance was not provided by survey respondents. It also includes R&D conducted by organizations within the United States, but where actual performance does not take place in a particular state or the District of Columbia, e.g., research conducted on marine vessels, and research in Puerto Rico. Finally, it also includes a small accounting difference due to the total for the U.S. being based on calendar year data, while data by state pertain to the fiscal year for non–industrial performance.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS). Data were derived from NSF/SRS, *Research and Development in Industry: 1995- 96*; NSF/SRS, *Academic Research and Development Expenditures, Fiscal Year 1996*; and NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1996, 1997, and 1998*; and Department of Commerce, Bureau of Economic Analysis.

See page 2-64 in Volume I.

Appendix table 2-22.
Trends in R&D and Federal outlays: FYs 1970, 1980, 1990, and proposed 2000

Composition of Federal outlays	1970	1980	1990	2000
		Billions of current dollars		
Total Federal outlays	196	591	1,253	1,798
Mandatory programs	61	262	569	991
Net interest	14	53	184	215
Defense discretionary	82	135	300	275
R&D outlays	8	15	42	38
International discretionary	4	13	19	20
R&D outlays	NA	0	0	0
Domestic discretionary	34	129	181	297
R&D outlays	8	17	23	39
Total R&D outlays	16	32	65	77
		Percent of total Federal outlays		
Total Federal outlays	100	100	100	100
Mandatory programs[a]	31.2	44.4	45.4	55.1
Net interest	7.4	8.9	14.7	12.0
Defense discretionary	41.8	22.8	23.9	15.3
R&D outlays	4.2	2.5	3.3	2.1
International discretionary	2.0	2.2	1.5	1.1
R&D outlays	NA	0.0	0.0	0.0
Domestic discretionary	17.5	21.8	14.5	16.5
R&D outlays	3.8	2.8	1.9	2.1
Total R&D outlays	8.1	5.4	5.2	4.3
Federal R&D Outlays as a proportion of discretionary outlays				
		(percent)		
Total R&D / Discretionary outlays	13.1	11.5	13.1	13.0
Defense R&D/defense outlays	10.1	11.1	13.9	14.0
International R&D/international outlays	NA	0.8	2.1	0.9
Domestic R&D/domestic outlays	21.9	13.0	12.9	13.0

[a]These include Social Security, Medicare, Medicaid, and other programs.

NA = not available

SOURCE: American Association for the Advancement of Science, *Research and Development: FY 2000* (Washington, DC: 1999).

See figure 2-19 in Volume I.

Appendix table 2-23.
Federal R&D budget authority, by budget function: fiscal years 1980–2000

Year	Total	National defense	Non-defense															
			Total non-defense	Health	Space research and technology	General science	Energy	Natural resources and environment	Transportation	Agriculture	Education, training, employment and social services	International affairs	Veterans benefits and services	Commerce and housing credit	Community and regional development	Administration of justice	Income security	General government
Millions of current dollars																		
1980	29,739	14,946	14,793	3,694	2,738	1,233	3,603	999	887	585	468	125	126	101	119	45	47	22
1981	33,735	18,413	15,322	3,871	3,111	1,340	3,501	1,061	869	659	298	160	143	106	104	34	43	22
1982	36,115	22,070	14,045	3,869	2,584	1,359	3,012	965	791	693	228	165	139	104	63	31	32	10
1983	38,768	24,936	13,832	4,298	2,134	1,502	2,578	952	876	745	189	177	157	107	44	37	32	6
1984	44,214	29,287	14,927	4,779	2,300	1,676	2,581	963	1,040	762	200	192	218	110	46	24	26	8
1985	49,887	33,698	16,189	5,418	2,725	1,862	2,389	1,059	1,030	836	220	210	193	114	50	47	21	17
1986	53,249	36,926	16,323	5,565	2,894	1,873	2,286	1,062	917	815	248	211	183	111	88	41	14	14
1987	57,069	39,152	17,917	6,556	3,398	2,042	2,053	1,133	908	822	267	223	215	110	99	49	25	17
1988	59,106	40,099	19,007	7,076	3,683	2,160	2,126	1,160	896	882	285	224	195	122	108	51	23	17
1989	62,115	40,665	21,450	7,773	4,555	2,373	2,419	1,255	1,064	907	347	279	212	128	74	45	27	15
1990	63,781	39,925	23,856	8,308	5,765	2,410	2,726	1,386	1,045	950	374	375	216	140	67	44	33	17
1991	65,898	39,328	26,570	9,226	6,511	2,635	2,953	1,582	1,231	1,052	433	378	219	178	88	51	30	4
1992	68,398	40,083	28,315	10,055	6,744	2,659	3,153	1,688	1,523	1,155	365	371	245	192	95	51	37	4
1993	69,884	41,249	28,635	10,280	6,988	2,691	2,677	1,802	1,703	1,152	348	382	250	220	57	49	36	1
1994	68,331	37,764	30,567	10,993	7,414	2,712	2,873	1,865	1,888	1,193	373	254	265	380	68	46	45	0
1995	68,791	37,204	31,587	11,407	7,916	2,794	2,844	1,988	1,833	1,194	369	287	257	525	70	59	43	1
1996	69,049	37,801	31,248	11,867	7,844	2,846	2,521	1,802	1,795	1,176	331	252	259	432	50	56	16	2
1997	71,653	39,591	32,062	12,670	7,844	2,944	2,372	1,886	1,785	1,203	373	190	267	409	48	59	9	2
1998	73,569	39,823	33,746	13,576	8,198	4,360	948	1,855	1,833	1,249	444	163	587	398	42	72	18	2
1999	76,886	40,387	36,499	15,479	8,239	4,739	1,164	1,928	1,731	1,352	457	165	674	401	49	82	37	2
2000	75,415	37,710	37,704	15,824	8,422	4,951	1,348	1,944	1,840	1,522	491	115	663	448	51	59	24	2
Millions of constant 1992 dollars																		
1980	50,167	25,213	24,954	6,231	4,619	2,080	6,078	1,685	1,496	987	789	211	213	170	201	76	79	37
1981	51,804	28,275	23,529	5,944	4,777	2,058	5,376	1,629	1,334	1,012	458	246	220	163	160	52	66	34
1982	51,800	31,655	20,145	5,549	3,706	1,949	4,320	1,384	1,135	994	327	237	199	149	90	44	46	14
1983	53,151	34,187	18,964	5,893	2,926	2,059	3,534	1,305	1,201	1,021	259	243	215	147	60	51	44	8
1984	58,361	38,658	19,703	6,308	3,036	2,212	3,407	1,271	1,373	1,006	264	253	288	145	61	32	34	11
1985	63,656	42,999	20,657	6,913	3,477	2,376	3,048	1,351	1,314	1,067	281	268	246	145	64	60	27	22
1986	66,066	45,814	20,252	6,904	3,591	2,324	2,836	1,318	1,138	1,011	308	262	227	138	109	51	17	17
1987	68,816	47,211	21,605	7,905	4,097	2,462	2,476	1,366	1,095	991	322	269	259	133	119	59	30	20
1988	68,880	46,730	22,150	8,246	4,292	2,517	2,478	1,352	1,044	1,028	332	261	227	142	126	59	27	20
1989	69,449	45,466	23,983	8,691	5,093	2,653	2,705	1,403	1,190	1,014	388	312	237	143	83	50	30	17
1990	68,471	42,861	25,610	8,919	6,189	2,587	2,926	1,488	1,122	1,020	402	403	232	150	72	47	35	18
1991	67,831	40,482	27,349	9,497	6,702	2,712	3,040	1,628	1,267	1,083	446	389	225	183	91	52	31	4
1992	68,398	40,083	28,315	10,055	6,744	2,659	3,153	1,688	1,523	1,155	365	371	245	192	95	51	37	4
1993	68,087	40,188	27,898	10,016	6,808	2,622	2,608	1,756	1,659	1,122	339	372	244	214	56	48	35	1

Appendix table 2-23.
Federal R&D budget authority, by budget function: fiscal years 1980–2000

Year	Total	National defense	Non-defense															
			Total non-defense	Health	Space research and technology	General science	Energy	Natural resources and environment	Transportation	Agriculture	Education, training, employment and social services	International affairs	Veterans benefits and services	Commerce and housing credit	Community and regional development	Administration of justice	Income security	General government
								Millions of constant 1992 dollars–continued										
1994	65,003	35,925	29,078	10,458	7,053	2,580	2,733	1,774	1,796	1,135	355	242	252	361	65	44	43	0
1995	63,902	34,560	29,342	10,596	7,353	2,595	2,642	1,847	1,703	1,109	343	267	239	488	65	55	40	1
1996	62,909	34,440	28,469	10,812	7,146	2,593	2,296	1,642	1,635	1,071	302	230	236	393	46	51	15	2
1997	64,073	35,403	28,670	11,330	7,014	2,633	2,121	1,687	1,596	1,076	334	170	239	365	43	53	8	2
1998	65,007	35,189	29,818	11,996	7,244	3,853	838	1,639	1,620	1,104	392	144	519	352	37	64	16	2
1999	67,067	35,230	31,838	13,502	7,187	4,134	1,015	1,682	1,510	1,179	399	144	588	350	43	72	32	2
2000	64,496	32,250	32,245	13,533	7,203	4,234	1,153	1,663	1,573	1,302	420	98	567	383	44	50	21	2

NOTES: Data for 1980–98 are actual budget authority. Data for 1999 and 2000 are preliminary based on the FY 2000 budget. See Appendix table 2-1 for GDP implicit price deflaters used to convert current dollars to constant 1992 dollars. Beginning in FY 1998, a number of Department of Energy programs were reclassified from energy to general science.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal R&D Funding by Budget Function: Fiscal Years 1998- 2000* (Arlington, VA: forthcoming).

See figure 2-4 in Volume 1.

Appendix table 2-24.
Federal basic research funding, by budget function: FYs 1980, 1985, and 1990–2000

Function	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
						Millions of current dollars							
Total	4,716	7,810	11,288	12,405	12,973	13,440	13,552	13,772	14,442	14,961	15,523	17,287	18,101
Health	1,761	3,243	4,661	5,021	5,506	5,700	5,889	6,068	6,395	6,852	7,356	8,429	8,590
General science	1,152	1,779	2,306	2,526	2,532	2,553	2,542	2,622	2,662	2,753	4,121	4,471	4,710
Space research and technology	482	498	1,389	1,479	1,499	1,588	1,796	1,614	1,685	1,653	1,610	1,719	1,841
National defense	552	856	964	1,188	1,147	1,323	1,174	1,181	1,165	1,090	1,067	1,158	1,152
Energy	200	428	761	878	921	917	921	930	1,182	1,288	34	36	46
Agriculture	246	406	456	486	528	553	567	565	547	548	571	657	736
Natural resources and environment	136	206	336	389	383	376	224	187	147	153	145	169	175
Transportation	79	255	242	246	266	238	220	389	456	420	411	438	634
Education, training, employment, and social services	61	86	106	115	118	121	145	153	140	142	133	135	144
Commerce and housing credit	15	23	31	39	35	34	38	35	37	34	35	36	38
Veterans' benefits and services	14	15	16	16	16	16	16	16	13	14	23	20	19
Administration of justice	9	4	9	6	5	5	5	9	12	13	16	18	15
Community and regional development	8	6	3	10	11	10	9	3	0	0	0	0	0
General government	–	4	3	0	0	0	0	0	0	0	0	0	0
International affairs	0	4	4	6	6	8	6	0	2	2	1	1	1
Income security	1	0	0	0	0	0	0	0	0	0	0	0	0
						Millions of constant 1992 dollars[a]							
Total	7,955	9,966	12,118	12,769	12,973	13,094	12,892	12,793	13,158	13,378	13,717	15,079	15,480
Health	2,971	4,138	5,004	5,168	5,506	5,553	5,602	5,637	5,826	6,128	6,500	7,353	7,346
General science	1,943	2,270	2,476	2,600	2,532	2,487	2,418	2,436	2,425	2,462	3,641	3,900	4,028
Space research and technology	813	635	1,491	1,522	1,499	1,547	1,709	1,499	1,535	1,478	1,423	1,499	1,575
National defense	931	1,092	1,035	1,223	1,147	1,289	1,117	1,097	1,061	975	943	1,010	985
Energy	337	546	817	904	921	893	876	864	1,077	1,152	30	32	39
Agriculture	415	518	490	500	528	539	539	525	498	490	504	573	629
Natural resources and environment	229	263	361	400	383	366	213	174	134	137	128	147	149
Transportation	133	325	260	253	266	232	209	361	415	375	363	382	542
Education, training, employment, and social services	103	110	114	118	118	118	138	142	128	127	118	118	123

Appendix table 2-24.
Federal basic research funding, by budget function: FYs 1980, 1985, and 1990–2000

Function	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Millions of constant 1992 dollars[a] –continued													
Commerce and housing credit	25	29	33	40	35	33	36	33	34	30	31	31	33
Veterans' benefits and services	24	19	17	16	16	16	15	15	12	13	21	17	16
Administration of justice	15	5	10	6	5	5	5	8	11	12	14	16	13
Community and regional development	13	8	3	10	11	10	9	3	0	0	0	0	0
General government	–	5	3	0	0	0	0	0	0	0	0	0	0
International affairs	0	5	4	6	6	8	6	0	2	2	1	1	1
Income security	2	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Data for 1980–98 are actual budget authority. Data for 1999 and 2000 are preliminary based on the FY 2000 budget. Beginning in FY 1998, a number of Department of Energy programs were reclassified from energy to general science.

[a]See appendix table 2-1 for GDP implicit price deflaters used to convert current dollars to constant 1992 dollars.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal R&D Funding by Budget Function: Fiscal Years 1998- 2000* (Arlington, VA: forthcoming).

Appendix table 2-25.
Federal obligations for research and development: FY 1967–99
(Millions of current dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1967	16,529	253	75	8,049	NA	NA	NA	170	0	284	1	41	0	NA	4,867	262	NA	14	7	NA
1968	15,921	254	84	7,709	NA	NA	NA	191	1	172	1	45	0	NA	4,429	283	NA	14	8	NA
1969	15,641	260	72	7,696	NA	NA	NA	208	5	232	1	50	0	NA	3,963	274	NA	15	8	NA
1970	15,339	281	122	7,360	NA	NA	NA	157	9	328	1	59	89	NA	3,800	289	NA	18	8	NA
1971	15,543	305	144	7,509	NA	NA	NA	192	10	497	1	63	137	NA	3,258	337	NA	15	9	NA
1972	16,496	350	187	8,318	NA	NA	NA	219	23	311	1	69	122	NA	3,157	455	NA	21	10	NA
1973	16,800	367	191	8,404	NA	NA	NA	244	33	311	1	74	181	NA	3,061	480	NA	24	14	NA
1974	17,410	379	181	8,420	NA	NA	NA	192	35	370	1	85	169	NA	3,002	556	42	25	13	NA
1975	19,039	420	215	9,012	NA	NA	NA	303	44	312	2	95	258	NA	3,064	595	64	25	17	NA
1976	20,780	462	229	9,655	NA	NA	NA	333	34	295	4	98	259	NA	3,447	609	88	26	19	NA
1977	23,450	547	245	10,963	NA	3,536	NA	315	28	355	5	107	295	NA	3,171	697	112	30	26	NA
1978	25,845	621	284	11,554	NA	4,245	NA	359	61	408	10	114	385	NA	3,333	749	134	35	31	NA
1979	28,145	663	309	12,506	166	4,639	3,505	406	43	370	10	127	410	106	3,578	808	149	37	38	NA
1980	29,830	688	343	13,981	139	4,754	3,780	411	42	361	12	133	345	149	3,234	882	183	41	80	NA
1981	33,104	774	328	16,509	105	4,918	3,927	427	27	416	11	144	326	134	3,593	962	220	45	69	NA
1982	36,433	797	336	20,623	128	4,708	3,941	381	27	310	13	137	335	200	3,078	975	220	52	85	NA
1983	38,712	848	335	22,993	112	4,537	4,353	382	31	348	16	161	241	227	2,662	1,062	207	56	63	NA
1984	42,225	866	358	25,373	116	4,674	4,831	411	25	448	14	190	261	237	2,822	1,203	191	64	68	NA
1985	48,360	943	399	29,792	125	4,966	5,451	392	36	429	24	227	320	220	3,327	1,346	150	71	79	NA
1986	51,412	929	399	32,938	121	4,688	5,658	385	36	385	24	186	317	251	3,420	1,353	124	63	78	NA
1987	55,254	948	402	35,232	133	4,757	6,606	404	42	325	27	210	348	218	3,787	1,471	123	72	78	73
1988	56,769	1,017	389	35,249	141	5,036	7,158	417	43	305	26	215	347	204	4,330	1,533	109	75	87	88
1989	61,407	1,038	398	37,577	159	5,193	7,903	469	38	303	26	235	380	279	5,394	1,670	115	80	63	87
1990	63,560	1,108	438	37,268	170	5,631	8,406	509	41	367	26	238	420	335	6,533	1,690	109	84	65	125
1991	61,295	1,237	490	32,135	171	5,983	9,756	593	49	380	31	217	433	378	7,280	1,785	109	98	68	104
1992	65,593	1,327	651	36,130	169	6,172	8,988	609	48	445	25	224	484	366	7,658	1,868	119	98	97	116
1993	67,314	1,328	656	35,849	178	6,262	10,349	619	49	545	17	236	495	382	8,020	1,882	120	102	109	116
1994	67,235	1,400	826	34,553	177	6,048	11,022	694	45	621	19	248	554	254	8,296	2,040	91	124	98	126
1995	68,187	1,380	1,136	33,796	178	6,145	11,455	562	58	727	61	238	552	303	9,015	2,149	88	124	93	127
1996	67,655	1,300	1,068	34,535	174	5,345	11,953	568	77	553	60	256	464	223	8,570	2,188	71	127	6	117
1997	69,830	1,389	1,003	34,788	181	5,604	12,788	580	85	527	60	253	492	206	9,327	2,249	62	130	9	98
1998	72,114	1,442	979	34,833	212	5,833	13,718	613	103	665	74	299	606	184	9,851	2,357	51	134	3	159
1999	73,333	1,426	1,036	34,350	263	6,541	14,821	638	98	768	75	300	610	184	9,201	2,655	53	142	0	173

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and NSF/SRS, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

Appendix table 2-26.
Federal obligations for research and development: FY 1967–99
(Millions of constant 1992 dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1967	63,016	965	286	30,686	NA	NA	NA	648	0	1,083	4	156	0	NA	18,555	999	NA	53	27	NA
1968	58,469	933	308	28,311	NA	NA	NA	701	4	632	4	165	0	NA	16,265	1,039	NA	51	29	NA
1969	55,016	915	253	27,070	NA	NA	NA	732	18	816	4	176	0	NA	13,940	964	NA	53	28	NA
1970	51,250	939	408	24,591	NA	NA	NA	525	30	1,096	3	197	297	NA	12,696	966	NA	60	27	NA
1971	49,390	969	458	23,861	NA	NA	NA	610	32	1,579	3	200	435	NA	10,353	1,071	NA	48	29	NA
1972	50,033	1,062	567	25,229	NA	NA	NA	664	70	943	3	209	370	NA	9,575	1,380	NA	64	30	NA
1973	48,809	1,066	555	24,416	NA	NA	NA	709	96	904	3	215	526	NA	8,893	1,395	NA	70	41	NA
1974	47,169	1,027	490	22,812	NA	NA	NA	520	95	1,002	3	230	458	NA	8,133	1,506	114	68	35	NA
1975	46,767	1,032	528	22,137	NA	NA	NA	744	108	766	5	233	634	NA	7,526	1,462	157	61	42	NA
1976	47,606	1,058	525	22,119	NA	NA	NA	763	78	676	9	225	593	NA	7,897	1,395	202	60	44	NA
1977	49,925	1,165	522	23,340	NA	7,528	NA	671	60	756	11	228	628	NA	6,751	1,484	238	64	55	NA
1978	51,402	1,235	565	22,979	NA	8,443	NA	714	121	811	20	227	766	NA	6,629	1,490	267	70	62	NA
1979	51,699	1,218	568	22,972	305	8,521	6,438	746	79	680	18	233	753	195	6,572	1,484	274	68	70	NA
1980	50,321	1,161	579	23,585	234	8,020	6,377	693	71	609	20	224	582	251	5,455	1,488	309	69	135	NA
1981	50,835	1,189	504	25,352	161	7,552	6,030	656	41	639	17	221	501	206	5,518	1,477	338	69	106	NA
1982	52,256	1,143	482	29,580	184	6,753	5,653	546	39	445	19	197	480	287	4,415	1,398	316	75	122	NA
1983	53,074	1,163	459	31,523	154	6,220	5,968	524	43	477	22	221	330	311	3,650	1,456	284	77	86	NA
1984	55,735	1,143	473	33,491	153	6,169	6,377	543	33	591	18	251	345	313	3,725	1,588	252	84	90	NA
1985	61,707	1,203	509	38,015	159	6,337	6,955	500	46	547	31	290	408	281	4,245	1,717	191	91	101	NA
1986	63,787	1,153	495	40,866	150	5,816	7,020	478	45	478	30	231	393	311	4,243	1,679	154	78	97	NA
1987	66,627	1,143	485	42,484	160	5,736	7,966	487	51	392	33	253	420	263	4,567	1,774	148	87	94	88
1988	66,157	1,185	453	41,078	164	5,869	8,342	486	50	355	30	251	404	238	5,046	1,787	127	87	101	103
1989	68,657	1,161	445	42,014	178	5,806	8,836	524	42	339	29	263	425	312	6,031	1,867	129	89	70	97
1990	68,234	1,189	470	40,009	183	6,045	9,024	546	44	394	28	256	451	360	7,013	1,814	117	90	70	134
1991	63,093	1,273	504	33,078	176	6,159	10,042	610	50	391	32	223	446	389	7,494	1,837	112	101	70	107
1992	65,593	1,327	651	36,130	169	6,172	8,988	609	48	445	25	224	484	366	7,658	1,868	119	98	97	116
1993	65,583	1,294	639	34,927	173	6,101	10,083	603	48	531	17	230	482	372	7,814	1,834	117	99	106	113
1994	63,961	1,332	786	32,870	168	5,753	10,485	660	43	590	18	236	527	242	7,892	1,941	86	118	93	120
1995	63,341	1,282	1,055	31,395	165	5,708	10,641	522	54	675	57	221	512	281	8,374	1,997	82	115	86	118
1996	61,639	1,185	973	31,464	158	4,870	10,890	517	70	503	55	233	423	203	7,808	1,994	65	116	6	107
1997	62,443	1,242	897	31,108	162	5,011	11,435	519	76	471	53	226	440	185	8,341	2,011	56	116	8	88
1998	63,722	1,274	865	30,779	187	5,154	12,121	542	91	587	66	264	535	162	8,704	2,083	45	118	3	140
1999	63,968	1,244	903	29,964	229	5,706	12,928	556	85	670	66	262	532	161	8,026	2,316	46	124	0	151

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and NSF/SRS, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

See figure 2-6 in Volume I.

Appendix table 2-27
Federal obligations for basic research: FY 1970–99
(Millions of current dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1970	1,926	116	18	317	NA	NA	NA	39	0	0	0	5	5	NA	358	245	NA	18	0	NA
1971	1,980	118	16	322	NA	NA	NA	42	0	0	0	3	6	NA	327	273	NA	15	0	NA
1972	2,187	137	8	329	NA	NA	NA	43	0	1	0	3	6	NA	332	368	NA	21	0	NA
1973	2,232	143	7	307	NA	NA	NA	49	2	0	0	3	9	NA	350	392	NA	24	0	NA
1974	2,388	146	8	303	NA	NA	NA	49	2	0	0	4	10	NA	306	415	0	25	0	NA
1975	2,588	154	8	300	NA	NA	NA	55	9	0	0	4	17	NA	309	486	0	25	0	NA
1976	2,767	171	11	327	NA	NA	NA	54	5	0	0	9	14	NA	293	524	0	26	0	NA
1977	3,259	204	12	373	NA	389	NA	64	5	0	0	9	8	NA	414	625	0	30	4	NA
1978	3,699	243	12	410	NA	441	NA	66	15	0	0	9	6	NA	480	678	0	35	4	NA
1979	4,193	256	12	472	21	463	NA	73	8	0	0	10	10	0	513	733	0	37	4	NA
1980	4,674	276	16	540	18	523	1,763	72	10	0	2	14	14	0	559	815	0	41	5	NA
1981	5,041	314	16	604	21	586	1,900	81	5	1	2	15	11	0	531	897	0	45	5	NA
1982	5,482	331	17	687	14	642	2,145	76	3	1	2	13	33	0	536	916	0	52	5	NA
1983	6,260	362	19	786	14	768	2,475	103	4	1	4	14	22	4	617	999	0	56	6	NA
1984	7,067	393	21	848	12	830	2,815	126	5	3	4	16	30	3	755	1,132	0	64	5	NA
1985	7,819	445	23	861	15	943	3,233	138	4	1	5	15	39	2	751	1,262	0	71	6	NA
1986	8,153	433	27	924	5	960	3,339	133	5	1	5	15	38	4	917	1,275	0	63	7	NA
1987	8,942	446	26	908	3	1,069	3,828	135	8	0	5	17	31	3	1,014	1,371	0	72	4	5
1988	9,474	481	31	877	4	1,185	4,081	127	8	0	5	17	27	3	1,113	1,433	0	75	3	4
1989	10,602	485	29	948	4	1,411	4,388	189	7	0	3	17	51	3	1,417	1,563	0	80	3	4
1990	11,286	519	31	948	5	1,505	4,649	205	9	0	3	16	74	5	1,637	1,586	0	84	5	4
1991	12,171	558	34	994	9	1,687	5,050	229	6	0	4	16	91	6	1,706	1,676	0	98	2	5
1992	12,490	595	35	1,099	8	1,736	5,059	231	5	1	4	16	110	6	1,738	1,742	0	98	2	6
1993	13,399	616	37	1,268	5	1,755	5,697	230	5	2	7	13	89	8	1,800	1,744	0	102	10	11
1994	13,524	606	40	1,201	6	1,603	5,884	83	6	3	0	14	101	2	1,964	1,871	0	124	9	6
1995	13,877	595	39	1,248	6	1,634	6,061	55	8	47	0	12	70	2	1,978	1,973	0	124	9	14
1996	14,464	550	38	1,138	4	1,930	6,505	56	13	38	0	13	52	2	1,981	2,007	0	127	0	12
1997	14,942	590	39	1,023	3	1,971	6,852	56	12	38	0	14	51	0	2,095	2,057	0	130	0	12
1998	15,862	598	41	1,016	5	2,077	7,361	57	19	59	0	14	57	1	2,246	2,165	0	134	0	11
1999	16,914	609	43	1,106	8	2,227	7,977	66	26	56	0	16	57	1	2,127	2,442	0	142	0	11

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and NSF/SRS, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

See figure 2-18 in Volume I.

Appendix table 2-28.
Federal obligations for basic research: FY 1970–99
(Millions of constant 1992 dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1970	6,435	387	61	1,059	NA	NA	NA	132	0	1	0	18	18	NA	1,195	818	NA	61	0	NA
1971	6,292	376	50	1,024	NA	NA	NA	133	0	1	0	10	19	NA	1,040	866	NA	48	0	NA
1972	6,633	416	24	997	NA	NA	NA	131	0	2	0	10	19	NA	1,006	1,115	NA	65	0	NA
1973	6,485	415	19	891	NA	NA	NA	142	6	0	0	9	26	NA	1,018	1,140	NA	70	0	NA
1974	6,469	395	21	821	NA	NA	NA	132	6	1	0	10	26	NA	829	1,125	0	67	0	NA
1975	6,358	379	20	737	NA	NA	NA	135	23	0	0	10	43	NA	760	1,194	0	61	0	NA
1976	6,340	393	25	749	NA	NA	NA	124	10	0	0	20	31	NA	672	1,200	0	59	0	NA
1977	6,938	435	26	795	NA	829	NA	135	11	0	0	19	18	NA	881	1,330	0	63	8	NA
1978	7,356	483	23	816	NA	876	NA	131	29	0	0	18	12	NA	954	1,349	0	69	8	NA
1979	7,701	471	22	866	38	850	NA	133	15	0	0	17	19	0	942	1,347	0	68	8	NA
1980	7,885	465	27	912	30	882	2,973	121	16	0	3	24	23	0	943	1,375	0	69	8	NA
1981	7,742	482	25	928	32	900	NA	124	7	2	4	23	16	0	816	1,377	0	69	7	NA
1982	7,862	474	24	985	20	921	2,726	110	4	1	3	19	47	0	768	1,314	0	75	7	NA
1983	8,583	496	26	1,077	19	1,053	2,940	141	5	1	5	19	30	6	846	1,370	0	77	8	NA
1984	9,329	518	27	1,119	16	1,096	3,267	166	6	5	5	21	39	4	996	1,495	0	84	7	NA
1985	9,977	568	30	1,099	19	1,203	3,591	176	5	1	6	20	49	2	958	1,610	0	91	7	NA
1986	10,115	537	33	1,146	6	1,191	4,011	165	7	1	6	18	48	5	1,137	1,582	0	79	9	NA
1987	10,783	538	31	1,095	4	1,289	4,616	163	10	0	6	20	37	4	1,223	1,653	0	87	5	6
1988	11,041	561	36	1,022	5	1,381	4,756	148	9	0	6	20	31	3	1,297	1,670	0	87	3	5
1989	11,854	542	32	1,060	4	1,578	4,906	211	8	0	3	19	57	3	1,584	1,748	0	89	3	4
1990	12,116	557	33	1,018	5	1,616	4,991	220	10	0	3	17	79	5	1,757	1,703	0	90	5	4
1991	12,528	574	35	1,023	9	1,736	5,198	236	6	0	4	16	94	6	1,756	1,725	0	101	2	5
1992	12,490	595	35	1,099	8	1,736	5,059	231	5	1	4	16	110	6	1,738	1,742	0	98	2	6
1993	13,054	600	36	1,235	5	1,710	5,550	224	5	2	7	13	87	8	1,754	1,699	0	99	10	11
1994	12,865	577	38	1,142	5	1,525	5,597	79	6	3	0	14	96	2	1,868	1,780	0	118	8	6
1995	12,891	553	37	1,160	5	1,518	5,630	51	8	44	0	12	65	2	1,837	1,833	0	115	8	13
1996	13,178	501	34	1,037	3	1,758	5,926	51	11	35	0	11	47	2	1,805	1,829	0	116	0	11
1997	13,362	528	35	915	3	1,762	6,127	50	11	34	0	12	46	0	1,873	1,839	0	116	0	11
1998	14,016	528	36	897	5	1,836	6,504	50	16	52	0	12	50	1	1,984	1,913	0	118	0	10
1999	14,754	531	37	965	7	1,942	6,958	58	23	49	0	14	50	1	1,855	2,130	0	124	0	10

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and National Science Foundation, Division of Science Resources Studies, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

Appendix table 2-29.
Federal obligations for applied research: FY 1970–99
(Millions of current dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1970	2,975	156	76	1,013	NA	NA	NA	81	5	83	0	53	48	NA	673	30	NA	0	6	NA
1971	3,143	174	98	987	NA	NA	NA	95	7	97	0	59	48	NA	595	46	NA	0	7	NA
1972	3,361	200	135	1,176	NA	NA	NA	104	12	98	0	64	45	NA	433	60	NA	0	8	NA
1973	3,349	211	124	1,129	NA	NA	NA	111	5	77	0	67	65	NA	444	72	NA	0	13	NA
1974	3,788	219	122	1,131	NA	NA	NA	95	16	62	0	75	87	NA	540	105	42	0	12	NA
1975	4,141	248	136	1,131	NA	NA	NA	179	9	54	0	83	124	NA	626	84	64	0	15	NA
1976	4,852	271	145	1,201	NA	NA	NA	205	14	31	1	76	142	NA	930	72	88	0	16	NA
1977	5,255	320	164	1,343	NA	502	NA	192	12	52	2	83	197	NA	792	63	112	0	19	NA
1978	5,908	352	181	1,414	NA	662	NA	218	31	67	4	91	247	NA	865	65	134	0	10	NA
1979	6,342	376	208	1,543	73	669	1,440	267	21	67	4	102	249	67	938	67	149	0	12	NA
1980	6,923	382	239	1,721	70	754	1,570	283	19	82	4	104	232	80	1,051	58	183	0	11	NA
1981	7,171	427	233	1,997	33	827	1,592	289	15	87	3	113	208	86	876	59	220	0	9	NA
1982	7,541	436	259	2,266	56	1,054	1,461	275	13	66	6	110	211	128	871	57	220	0	8	NA
1983	7,993	456	266	2,437	62	1,193	1,545	255	17	72	7	132	152	153	928	63	207	0	7	NA
1984	7,911	442	276	2,201	69	1,194	1,651	254	13	74	7	156	142	164	955	70	191	0	9	NA
1985	8,315	466	301	2,307	77	1,198	1,796	231	15	70	14	194	176	158	1,033	84	150	0	9	NA
1986	8,349	464	313	2,303	91	1,081	1,851	235	17	68	13	155	179	181	1,152	78	124	0	11	NA
1987	8,998	473	313	2,440	104	1,029	2,194	247	12	69	13	173	246	151	1,256	99	123	0	14	43
1988	9,177	505	312	2,362	107	1,051	2,416	266	10	91	11	179	241	132	1,219	100	109	0	15	53
1989	10,164	517	322	2,708	118	1,021	2,700	253	11	121	13	197	223	216	1,461	108	115	0	12	49
1990	10,337	542	346	2,582	125	1,066	2,818	270	11	119	15	199	242	300	1,424	103	109	0	17	49
1991	11,798	618	415	2,724	123	1,587	3,112	324	15	115	21	178	262	352	1,666	109	109	0	17	52
1992	12,001	666	561	2,975	120	1,676	2,887	340	15	156	17	185	294	294	1,491	127	119	0	22	56
1993	13,491	636	545	3,515	128	1,685	3,496	350	21	224	5	194	272	351	1,749	138	120	0	18	45
1994	13,888	716	678	3,040	131	1,679	3,853	567	20	270	9	209	301	214	1,877	170	91	0	17	45
1995	14,557	704	853	2,950	133	1,826	4,015	477	18	324	49	206	331	270	2,068	176	88	0	17	52
1996	13,796	670	813	2,858	132	1,433	4,041	486	20	337	50	223	329	203	1,897	181	71	0	4	49
1997	14,423	700	769	2,787	135	1,597	4,376	496	20	344	51	217	358	177	2,090	192	62	0	4	49
1998	15,609	741	785	2,864	150	1,671	4,691	526	26	418	63	263	450	141	2,484	192	51	0	1	94
1999	16,079	712	807	2,983	195	1,902	5,005	542	22	440	64	260	453	135	2,217	213	53	0	0	79

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

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See figure 2-18 in Volume I.

Appendix table 2-30.
Federal obligations for applied research: FY 1970–99
(Millions of constant 1992 dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1970	9,939	522	254	3,384	NA	NA	NA	271	18	277	1	175	159	NA	2,248	100	NA	0	21	NA
1971	9,987	552	311	3,137	NA	NA	NA	302	21	307	1	188	152	NA	1,892	145	NA	0	24	NA
1972	10,193	606	411	3,566	NA	NA	NA	316	38	296	1	194	136	NA	1,313	181	NA	0	25	NA
1973	9,731	614	359	3,281	NA	NA	NA	324	14	224	1	193	190	NA	1,289	208	NA	0	36	NA
1974	10,262	595	329	3,065	NA	NA	NA	257	45	167	1	204	235	NA	1,463	285	115	0	31	NA
1975	10,173	609	335	2,778	NA	NA	NA	440	23	132	1	205	305	NA	1,537	206	158	0	36	NA
1976	11,115	621	332	2,751	NA	NA	NA	470	32	71	3	175	325	NA	2,130	165	203	0	38	NA
1977	11,189	680	349	2,858	NA	1,068	NA	410	27	110	5	177	419	NA	1,687	135	239	0	41	NA
1978	11,751	700	360	2,812	NA	1,316	NA	433	62	132	8	180	491	NA	1,721	130	266	0	19	NA
1979	11,650	690	381	2,834	134	1,229	2,644	490	38	123	8	187	457	123	1,724	123	273	0	23	NA
1980	11,679	644	402	2,904	118	1,272	2,649	477	32	139	7	175	391	134	1,772	99	308	0	19	NA
1981	11,013	655	358	3,066	51	1,270	2,444	444	23	134	4	173	319	133	1,345	90	337	0	14	NA
1982	10,816	625	372	3,250	81	1,512	2,095	394	19	94	9	158	302	183	1,250	82	316	0	12	NA
1983	10,959	625	364	3,341	85	1,636	2,119	349	23	98	9	181	209	209	1,272	86	284	0	9	NA
1984	10,443	584	364	2,905	91	1,577	2,180	336	17	98	9	206	188	216	1,260	93	252	0	12	NA
1985	10,610	594	384	2,944	99	1,529	2,291	295	19	90	17	247	225	202	1,318	107	191	0	11	NA
1986	10,359	575	388	2,858	113	1,341	2,296	291	21	84	16	192	222	224	1,430	97	154	0	13	NA
1987	10,850	570	377	2,942	125	1,241	2,646	298	14	83	16	209	297	182	1,515	119	148	0	17	52
1988	10,695	589	364	2,753	125	1,225	2,816	310	12	106	13	209	281	154	1,421	117	127	0	17	62
1989	11,364	578	360	3,028	132	1,142	3,019	283	12	135	15	220	249	242	1,633	121	129	0	13	55
1990	11,097	582	371	2,772	134	1,144	3,025	290	12	128	16	214	260	322	1,529	111	117	0	18	53
1991	12,144	636	427	2,804	127	1,634	3,203	334	15	118	22	183	270	362	1,715	112	112	0	17	54
1992	12,001	666	561	2,975	120	1,676	2,887	340	15	156	17	185	294	294	1,491	127	119	0	22	56
1993	13,144	620	531	3,425	125	1,642	3,406	341	20	218	5	189	265	342	1,704	134	117	0	18	44
1994	13,211	681	645	2,892	125	1,597	3,665	539	19	257	9	199	286	204	1,785	161	86	0	16	43
1995	13,523	654	792	2,740	123	1,696	3,730	443	16	301	45	192	308	251	1,921	163	82	0	16	48
1996	12,569	610	741	2,603	120	1,305	3,682	443	18	307	46	203	300	185	1,728	165	65	0	4	45
1997	12,898	626	687	2,492	121	1,428	3,913	444	18	307	45	194	320	158	1,869	172	56	0	4	44
1998	13,793	655	694	2,531	132	1,477	4,145	465	23	369	55	232	398	125	2,195	169	45	0	1	83
1999	14,025	621	704	2,602	170	1,659	4,365	473	19	383	56	227	395	117	1,934	185	46	0	0	69

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and NSF/SRS, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

Science & Engineering Indicators - 2000

Appendix table 2-31.
Federal obligations for development: FY 1970–99
(Millions of current dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1970	10,438	9	27	6,030	NA	NA	NA	36	3	245	0	1	36	NA	2,770	14	NA	0	2	NA
1971	10,419	13	30	6,200	NA	NA	NA	55	4	400	0	1	83	NA	2,335	19	NA	0	2	NA
1972	10,948	12	44	6,814	NA	NA	NA	71	11	212	1	2	71	NA	2,393	28	NA	0	2	NA
1973	11,219	12	60	6,968	NA	NA	NA	84	26	233	1	5	106	NA	2,267	16	NA	0	2	NA
1974	11,235	14	51	6,986	NA	NA	NA	49	16	308	1	6	73	NA	2,157	36	0	0	2	NA
1975	12,309	18	71	7,581	NA	NA	NA	69	25	258	1	8	116	NA	2,129	25	0	0	2	NA
1976	13,160	20	73	8,127	NA	NA	NA	74	16	263	2	13	104	NA	2,224	13	0	0	2	NA
1977	14,936	23	69	9,248	NA	2,645	NA	59	10	303	3	15	90	NA	1,965	9	0	0	4	NA
1978	16,238	27	91	9,730	NA	3,143	NA	75	15	342	6	15	132	NA	1,988	5	0	0	18	NA
1979	17,610	31	90	10,492	73	3,507	489	66	14	303	5	16	151	40	2,127	8	0	0	22	NA
1980	18,233	30	88	11,719	52	3,476	447	57	13	279	6	16	100	70	1,624	8	0	0	64	NA
1981	20,891	33	79	13,908	51	3,505	435	57	7	327	6	17	107	48	2,186	6	0	0	55	NA
1982	23,410	31	60	17,670	58	3,012	335	30	10	243	5	14	92	72	1,671	2	0	0	72	NA
1983	24,458	30	50	19,770	36	2,576	332	25	11	275	5	15	66	71	1,117	0	0	0	51	NA
1984	27,246	31	62	22,324	35	2,649	365	31	7	371	3	18	89	70	1,113	0	0	0	54	NA
1985	32,226	32	75	26,623	33	2,825	423	22	17	358	6	18	106	61	1,544	0	0	0	65	NA
1986	34,910	32	60	29,711	25	2,648	468	17	14	317	6	16	100	66	1,351	0	0	0	60	NA
1987	37,313	29	64	31,884	26	2,659	584	22	23	256	10	19	71	64	1,518	0	0	0	60	26
1988	38,119	31	47	32,010	30	2,801	661	24	26	213	10	19	80	69	1,999	0	0	0	69	31
1989	40,641	36	47	33,921	37	2,761	814	27	21	183	9	21	107	60	2,515	0	0	0	48	34
1990	41,937	47	61	33,739	40	3,060	939	33	21	247	7	22	105	29	3,473	0	0	0	43	72
1991	37,327	61	40	28,417	39	2,710	1,594	40	28	265	7	23	80	20	3,909	0	0	0	50	46
1992	41,102	66	55	32,056	42	2,760	1,042	39	28	288	4	23	80	66	4,428	0	0	0	73	53
1993	40,424	76	74	31,066	44	2,822	1,157	39	23	319	6	29	134	23	4,471	0	0	0	81	61
1994	39,824	77	108	30,313	40	2,766	1,285	44	19	347	10	25	151	38	4,456	0	0	0	72	74
1995	39,752	81	244	29,598	39	2,685	1,379	29	32	356	12	19	150	30	4,969	0	0	0	67	62
1996	39,395	80	217	30,540	38	1,983	1,407	26	45	177	10	21	84	18	4,692	0	0	0	2	56
1997	40,464	99	195	30,978	43	2,036	1,560	27	52	146	9	22	83	30	5,142	0	0	0	5	38
1998	40,644	103	153	30,953	57	2,085	1,666	30	58	188	12	23	99	41	5,122	0	0	0	2	54
1999	40,341	105	186	30,262	60	2,413	1,839	30	50	273	11	25	100	49	4,858	0	0	0	0	82

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and NSF/SRS, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

See figure 2-18 in Volume I.

Appendix table 2-32.
Federal obligations for development: FY 1970–99
(Millions of constant 1992 dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1970	34,875	31	92	20,149	NA	NA	NA	121	11	817	1	3	119	NA	9,254	47	NA	0	6	NA
1971	33,109	41	95	19,701	NA	NA	NA	174	12	1,272	1	3	263	NA	7,421	59	NA	0	6	NA
1972	33,207	38	133	20,666	NA	NA	NA	217	33	644	2	6	216	NA	7,257	84	NA	0	6	NA
1973	32,594	36	176	20,244	NA	NA	NA	243	76	678	2	13	309	NA	6,586	46	NA	0	5	NA
1974	30,439	37	139	18,927	NA	NA	NA	133	44	834	2	16	198	NA	5,843	98	0	0	4	NA
1975	30,236	45	174	18,623	NA	NA	NA	170	62	633	3	19	285	NA	5,230	61	0	0	5	NA
1976	30,150	46	168	18,619	NA	NA	NA	169	36	603	5	29	238	NA	5,095	31	0	0	5	NA
1977	31,800	49	146	19,688	NA	5,631	NA	125	21	645	6	31	192	NA	4,183	19	0	0	8	NA
1978	32,296	53	181	19,351	NA	6,250	NA	150	30	680	11	29	262	NA	3,954	10	0	0	36	NA
1979	32,348	57	165	19,273	134	6,442	899	122	26	557	9	29	278	73	3,907	15	0	0	40	NA
1980	30,758	51	149	19,769	87	5,864	755	96	21	470	11	26	169	118	2,740	14	0	0	108	NA
1981	32,081	51	121	21,357	78	5,382	668	88	11	502	9	26	165	73	3,357	9	0	0	84	NA
1982	33,578	44	86	25,344	82	4,320	481	42	15	349	7	21	132	103	2,396	3	0	0	104	NA
1983	33,532	41	69	27,105	49	3,531	455	34	15	377	7	21	91	97	1,531	0	0	0	70	NA
1984	35,964	41	81	29,467	46	3,496	481	40	9	489	4	24	118	93	1,469	0	0	0	71	NA
1985	41,121	41	95	33,971	42	3,605	539	29	21	456	8	22	135	77	1,970	0	0	0	83	NA
1986	43,313	40	74	36,862	32	3,285	581	21	18	394	8	20	123	82	1,676	0	0	0	74	NA
1987	44,993	35	77	38,447	31	3,206	704	27	28	309	12	23	86	77	1,830	0	0	0	72	31
1988	44,423	36	55	37,303	35	3,264	770	28	30	248	12	22	93	80	2,330	0	0	0	80	36
1989	45,439	40	53	37,926	41	3,087	910	30	23	205	10	23	120	67	2,812	0	0	0	54	38
1990	45,021	50	65	36,220	43	3,285	1,008	35	23	265	8	24	113	31	3,728	0	0	0	46	77
1991	38,422	63	41	29,251	40	2,790	1,641	41	29	273	7	24	82	21	4,024	0	0	0	51	47
1992	41,102	66	55	32,056	42	2,760	1,042	39	28	288	4	23	80	66	4,428	0	0	0	73	53
1993	39,384	74	72	30,267	43	2,749	1,127	38	22	311	6	28	131	22	4,356	0	0	0	79	59
1994	37,885	74	103	28,836	38	2,631	1,223	42	18	330	9	23	144	36	4,239	0	0	0	68	70
1995	36,927	76	226	27,495	37	2,494	1,281	27	30	331	12	18	139	28	4,616	0	0	0	62	58
1996	35,892	73	198	27,824	35	1,806	1,282	23	41	162	9	19	76	16	4,275	0	0	0	2	51
1997	36,184	88	174	27,701	39	1,820	1,395	24	47	130	8	19	74	27	4,598	0	0	0	4	34
1998	35,914	91	135	27,351	50	1,842	1,472	27	51	166	10	20	87	36	4,525	0	0	0	2	48
1999	35,189	92	162	26,397	52	2,104	1,604	26	44	238	10	22	87	42	4,237	0	0	0	0	72

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and NSF/SRS, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

Appendix table 2-33.
Federal obligations for R&D Plant: FY 1967–99
(Millions of current dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1967	620	8	4	87	NA	NA	NA	32	0	9	0	5	0	NA	121	65	NA	0	0	NA
1968	604	18	4	198	NA	NA	NA	27	0	8	0	3	0	NA	65	67	NA	0	0	NA
1969	669	11	3	194	NA	NA	NA	14	0	6	0	4	0	NA	55	27	NA	0	0	NA
1970	524	5	4	141	NA	NA	NA	11	0	5	0	3	2	NA	33	23	NA	0	0	NA
1971	611	5	9	154	NA	NA	NA	9	0	11	0	15	1	NA	40	28	NA	0	1	NA
1972	602	8	7	175	NA	NA	NA	14	0	26	0	2	1	NA	45	19	NA	0	1	NA
1973	774	3	8	146	NA	NA	NA	22	0	38	0	10	24	NA	69	57	NA	0	5	NA
1974	766	9	12	169	NA	NA	NA	2	0	13	0	2	1	NA	98	12	4	0	10	NA
1975	821	8	10	167	NA	NA	NA	4	0	13	0	2	2	NA	143	23	3	0	12	NA
1976	837	16	7	143	NA	NA	NA	6	0	14	0	12	6	NA	82	53	10	0	10	NA
1977	1,367	13	7	446	NA	561	NA	5	0	23	0	6	2	NA	118	27	7	0	4	NA
1978	1,296	25	4	233	NA	691	NA	15	0	14	0	4	5	NA	162	40	7	0	22	NA
1979	1,475	23	2	270	0	844	53	5	0	23	0	5	2	6	148	30	9	1	51	NA
1980	1,556	57	5	208	0	1,024	31	8	0	23	0	4	0	6	159	19	8	1	1	NA
1981	1,486	21	1	278	0	978	24	3	0	19	0	15	0	8	116	15	8	0	0	NA
1982	1,390	21	1	291	0	914	25	1	0	12	0	3	0	6	114	2	0	0	0	NA
1983	1,297	34	1	313	0	758	48	2	0	22	0	11	0	5	101	3	0	1	0	NA
1984	1,787	39	9	529	0	852	31	5	0	17	0	6	0	8	244	45	0	0	0	NA
1985	1,821	41	4	531	1	868	42	4	0	9	0	3	0	7	234	74	0	2	1	NA
1986	1,539	79	9	286	7	742	38	4	0	12	0	5	0	8	275	53	0	1	1	NA
1987	1,846	112	5	477	21	772	37	12	11	11	0	6	0	7	309	61	0	3	0	1
1988	2,057	135	11	436	5	915	20	9	0	14	0	20	0	6	428	57	0	1	0	0
1989	2,165	89	9	499	2	873	79	11	0	16	0	11	0	0	520	54	0	3	0	0
1990	2,272	102	15	487	9	916	108	14	0	22	0	3	0	0	527	39	0	5	5	19
1991	2,853	145	16	426	4	1,220	86	22	0	18	0	3	0	0	724	160	0	2	5	23
1992	2,985	165	21	397	2	1,321	97	18	0	25	0	6	0	0	818	102	0	4	3	7
1993	3,101	142	25	372	2	1,462	149	23	0	32	0	3	3	0	749	130	0	5	1	1
1994	2,215	126	31	266	2	912	120	9	0	41	0	12	5	0	515	172	0	5	0	0
1995	2,256	143	78	61	2	745	256	7	0	29	0	7	5	0	625	290	0	5	0	5
1996	1,746	128	85	47	0	706	133	2	0	32	0	4	0	0	417	187	0	5	0	0
1997	1,915	184	43	86	0	729	260	7	0	19	0	31	25	0	322	204	0	4	0	0
1998	2,089	107	131	95	0	759	417	2	0	19	0	1	31	0	312	211	0	5	0	0
1999	1,997	103	70	76	0	937	254	2	0	25	0	1	21	0	301	202	0	5	0	0

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

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See figure 2-18 in Volume I.

Appendix table 2-34.
Federal obligations for R&D Plant: FY 1967–99
(Millions of constant 1992 dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1967	2,364	31	16	331	NA	NA	NA	123	0	34	0	19	0	NA	461	250	NA	1	0	NA
1968	2,218	67	16	728	NA	NA	NA	99	0	30	0	12	0	NA	239	246	NA	1	0	NA
1969	2,353	38	11	682	NA	NA	NA	50	0	20	0	15	0	NA	193	95	NA	0	1	NA
1970	1,752	18	13	470	NA	NA	NA	35	0	18	0	9	7	NA	112	78	NA	0	0	NA
1971	1,942	16	29	488	NA	NA	NA	27	0	34	0	48	3	NA	128	89	NA	0	2	NA
1972	1,826	24	23	530	NA	NA	NA	42	0	78	0	7	2	NA	137	56	NA	0	5	NA
1973	2,250	8	23	425	NA	NA	NA	64	0	111	0	30	71	NA	201	166	NA	0	13	NA
1974	2,076	24	31	458	NA	NA	NA	6	0	36	0	6	3	NA	266	32	10	1	26	NA
1975	2,016	19	23	411	NA	NA	NA	10	0	33	0	5	5	NA	350	57	7	1	30	NA
1976	1,917	37	15	329	NA	NA	NA	14	0	33	0	27	14	NA	188	120	22	1	23	NA
1977	2,911	27	15	949	NA	1,194	NA	11	0	48	0	13	4	NA	251	58	15	0	8	NA
1978	2,577	49	8	463	NA	1,374	NA	30	0	28	0	8	9	NA	323	79	14	0	44	NA
1979	2,710	42	4	496	0	1,551	98	9	0	42	0	9	4	12	271	55	16	2	93	NA
1980	2,624	96	8	351	0	1,728	52	13	0	39	0	7	0	11	268	32	13	2	1	NA
1981	2,281	32	2	426	0	1,502	36	5	0	29	0	23	0	12	178	22	12	1	1	NA
1982	1,993	31	1	417	0	1,311	35	2	0	17	0	4	0	9	163	2	0	1	0	NA
1983	1,779	46	1	428	0	1,039	66	3	0	30	0	14	0	7	138	4	0	1	0	NA
1984	2,359	52	12	699	0	1,125	41	7	0	22	0	8	0	10	322	60	0	0	0	NA
1985	2,323	52	5	677	1	1,108	54	5	0	11	0	4	0	9	299	94	0	2	1	NA
1986	1,909	98	11	355	8	921	47	5	0	15	0	6	0	9	341	66	0	1	1	NA
1987	2,226	135	6	575	25	931	45	14	13	13	0	7	0	8	373	74	0	4	0	1
1988	2,397	157	13	508	6	1,066	23	10	0	16	0	23	0	7	499	66	0	1	0	0
1989	2,421	100	10	558	2	976	88	12	0	18	0	12	0	0	581	60	0	3	0	0
1990	2,439	110	16	523	10	983	116	15	0	24	0	3	0	0	566	42	0	5	5	20
1991	2,937	149	16	438	4	1,256	89	23	0	19	0	3	0	0	745	165	0	2	5	24
1992	2,985	165	21	397	2	1,321	97	18	0	25	0	6	0	0	818	102	0	4	3	7
1993	3,021	138	24	362	2	1,424	145	22	0	31	0	3	3	0	730	127	0	5	1	1
1994	2,107	120	30	253	2	867	114	9	0	39	0	11	5	0	490	164	0	5	0	0
1995	2,096	133	72	56	2	692	238	6	0	27	0	7	4	0	580	269	0	5	0	5
1996	1,591	117	77	43	0	643	121	2	0	29	0	3	0	0	380	171	0	5	0	0
1997	1,712	165	39	76	0	652	233	6	0	17	0	28	22	0	288	182	0	4	0	0
1998	1,846	95	115	84	0	671	368	2	0	16	0	1	27	0	276	186	0	4	0	0
1999	1,742	90	61	66	0	817	221	2	0	22	0	1	18	0	262	176	0	4	0	0

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and NSF/SRS, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

Appendix table 2-35.
Federal obligations for R&D and R&D Plant: FY 1967–99
(Millions of current dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1967	17,149	261	79	8,136	NA	NA	NA	203	0	293	1	46	0	NA	4,988	328	NA	14	7	NA
1968	16,525	272	88	7,908	NA	NA	NA	218	1	180	1	48	0	NA	4,494	350	NA	14	8	NA
1969	16,310	271	75	7,890	NA	NA	NA	222	5	237	1	54	0	NA	4,018	301	NA	15	8	NA
1970	15,863	286	125	7,501	NA	NA	NA	167	9	333	1	61	90	NA	3,833	312	NA	18	8	NA
1971	16,154	310	153	7,663	NA	NA	NA	200	10	508	1	78	138	NA	3,298	365	NA	15	10	NA
1972	17,098	357	195	8,493	NA	NA	NA	232	23	336	1	71	123	NA	3,202	473	NA	21	12	NA
1973	17,574	369	198	8,551	NA	NA	NA	266	33	349	1	85	205	NA	3,130	537	NA	24	19	NA
1974	18,176	388	192	8,590	NA	NA	NA	195	35	383	1	87	170	NA	3,101	568	46	25	23	NA
1975	19,860	428	225	9,180	NA	NA	NA	307	44	325	2	97	260	NA	3,207	618	67	25	29	NA
1976	21,616	479	235	9,798	NA	NA	NA	339	34	309	4	110	265	NA	3,529	662	98	26	29	NA
1977	24,818	560	252	11,409	NA	4,097	NA	320	28	377	5	113	298	NA	3,289	724	119	30	30	NA
1978	27,141	646	288	11,786	NA	4,936	NA	374	61	422	10	118	389	NA	3,496	788	141	35	53	NA
1979	29,621	686	312	12,776	166	5,483	3,558	411	43	393	10	132	413	113	3,726	838	157	38	89	NA
1980	31,386	744	347	14,189	139	5,778	3,811	419	42	385	12	138	345	156	3,393	900	190	42	81	NA
1981	34,590	795	329	16,786	105	5,896	3,951	431	27	434	11	159	326	142	3,709	976	227	45	69	NA
1982	37,822	819	337	20,913	128	5,622	3,965	382	27	322	13	140	335	206	3,192	977	220	53	85	NA
1983	40,009	881	336	23,305	112	5,294	4,400	385	31	370	16	172	241	232	2,762	1,065	207	57	63	NA
1984	44,012	905	368	25,902	116	5,526	4,862	416	25	465	14	196	261	245	3,066	1,248	191	64	68	NA
1985	50,180	984	403	30,322	126	5,834	5,493	396	36	438	24	230	320	227	3,562	1,419	150	73	80	NA
1986	52,951	1,008	408	33,224	128	5,431	5,695	390	36	398	24	191	317	259	3,695	1,406	124	64	78	NA
1987	57,100	1,060	408	35,709	154	5,529	6,643	416	54	336	27	215	348	224	4,097	1,532	123	74	78	74
1988	58,827	1,152	400	35,685	146	5,951	7,178	426	43	319	26	235	347	211	4,759	1,590	109	76	88	88
1989	63,572	1,128	407	38,076	161	6,066	7,981	480	38	319	26	246	380	279	5,913	1,724	115	84	63	87
1990	65,831	1,211	454	37,756	179	6,547	8,513	523	41	388	26	241	420	335	7,060	1,729	109	89	70	144
1991	64,148	1,381	505	32,561	175	7,203	9,842	615	49	398	31	220	433	378	8,004	1,945	109	100	73	127
1992	68,577	1,492	672	36,526	171	7,493	9,085	628	48	470	25	230	484	366	8,475	1,970	119	102	101	122
1993	70,415	1,470	682	36,221	180	7,724	10,499	642	49	578	17	240	498	382	8,769	2,012	120	107	110	117
1994	69,451	1,526	857	34,819	178	6,960	11,142	703	45	662	19	260	558	254	8,812	2,212	91	129	98	126
1995	70,443	1,524	1,214	33,857	179	6,890	11,711	568	58	756	62	245	556	303	9,640	2,439	88	129	93	132
1996	69,401	1,429	1,152	34,582	174	6,051	12,086	570	77	584	60	260	464	223	8,988	2,376	71	132	6	117
1997	71,745	1,573	1,047	34,874	181	6,333	13,048	587	85	546	60	284	517	206	9,649	2,452	62	134	9	98
1998	74,203	1,549	1,109	34,928	212	6,592	14,135	615	103	683	74	301	637	184	10,163	2,568	51	139	3	159
1999	75,331	1,529	1,106	34,427	263	7,478	15,075	640	98	793	75	301	631	184	9,502	2,857	53	147	0	173

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and NSF/SRS, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

Appendix table 2-36.
Federal obligations for R&D and R&D Plant: FY 1967–99
(Millions of constant 1992 dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1967	65,380	995	301	31,017	NA	NA	NA	773	1	1,116	2	175	0	NA	19,015	1,250	NA	53	27	NA
1968	60,687	998	324	29,040	NA	NA	NA	799	4	660	3	176	0	NA	16,505	1,287	NA	51	29	NA
1969	57,369	952	265	27,752	NA	NA	NA	780	17	835	2	191	0	NA	14,133	1,058	NA	52	30	NA
1970	53,002	957	419	25,062	NA	NA	NA	559	29	1,114	2	205	302	NA	12,808	1,043	NA	61	27	NA
1971	51,331	985	486	24,349	NA	NA	NA	636	33	1,614	3	248	438	NA	10,480	1,159	NA	48	31	NA
1972	51,859	1,084	590	25,759	NA	NA	NA	705	71	1,020	4	216	373	NA	9,713	1,436	NA	65	35	NA
1973	51,059	1,073	577	24,842	NA	NA	NA	772	96	1,014	3	246	596	NA	9,094	1,560	NA	70	55	NA
1974	49,245	1,050	521	23,272	NA	NA	NA	527	94	1,038	3	236	462	NA	8,400	1,539	125	68	62	NA
1975	48,783	1,051	552	22,549	NA	NA	NA	755	109	798	4	238	638	NA	7,878	1,518	165	62	71	NA
1976	49,522	1,096	539	22,447	NA	NA	NA	777	78	707	9	251	608	NA	8,085	1,516	225	60	66	NA
1977	52,837	1,192	536	24,290	NA	8,723	NA	681	59	803	10	240	634	NA	7,002	1,542	254	64	64	NA
1978	53,979	1,285	572	23,441	NA	9,816	NA	744	121	840	20	235	774	NA	6,952	1,568	280	70	106	NA
1979	54,410	1,259	573	23,469	305	10,072	6,536	755	79	721	18	243	758	207	6,844	1,540	289	70	164	NA
1980	52,946	1,256	586	23,936	235	9,747	6,428	706	70	649	20	232	582	262	5,724	1,519	321	71	136	NA
1981	53,117	1,220	506	25,778	161	9,055	6,067	661	41	667	17	244	500	218	5,695	1,499	349	70	106	NA
1982	54,249	1,174	484	29,996	184	8,064	5,688	548	38	462	19	201	481	295	4,578	1,401	316	76	122	NA
1983	54,852	1,208	460	31,951	153	7,259	6,033	528	43	507	21	236	330	318	3,787	1,460	284	78	87	NA
1984	58,094	1,195	485	34,190	153	7,294	6,417	549	32	614	18	259	345	323	4,047	1,647	252	84	90	NA
1985	64,030	1,255	514	38,691	161	7,445	7,009	505	46	559	31	293	409	290	4,544	1,811	191	93	102	NA
1986	65,696	1,250	507	41,221	159	6,738	7,066	483	45	493	30	237	394	321	4,584	1,745	154	79	97	NA
1987	68,853	1,278	492	43,059	186	6,667	8,010	502	65	405	33	259	420	270	4,940	1,847	148	89	94	89
1988	68,555	1,343	466	41,586	170	6,935	8,365	496	50	372	30	274	404	246	5,546	1,853	127	89	103	103
1989	71,078	1,261	455	42,572	180	6,782	8,923	537	42	357	29	275	425	312	6,611	1,928	129	94	70	97
1990	70,672	1,300	487	40,532	192	7,028	9,139	561	44	417	28	259	451	360	7,579	1,856	117	96	75	155
1991	66,030	1,422	520	33,516	180	7,414	10,131	633	50	410	32	226	446	389	8,239	2,002	112	103	75	131
1992	68,577	1,492	672	36,526	171	7,493	9,085	628	48	470	25	230	484	366	8,475	1,970	119	102	101	122
1993	68,604	1,432	664	35,289	175	7,525	10,229	625	48	563	17	234	485	372	8,543	1,960	117	104	107	114
1994	66,068	1,451	816	33,123	170	6,621	10,599	669	43	629	18	247	531	242	8,382	2,104	86	123	93	120
1995	65,437	1,415	1,127	31,451	167	6,400	10,879	528	54	702	57	228	517	281	8,955	2,266	82	120	86	123
1996	63,230	1,302	1,050	31,507	158	5,513	11,011	519	70	532	55	237	423	203	8,188	2,164	65	120	6	107
1997	64,155	1,406	936	31,185	162	5,663	11,668	525	76	488	53	254	462	185	8,628	2,193	56	120	8	88
1998	65,568	1,369	980	30,863	187	5,825	12,490	544	91	604	66	266	563	162	8,980	2,269	45	122	3	140
1999	65,710	1,334	964	30,030	229	6,523	13,150	558	85	692	66	263	550	161	8,289	2,492	46	128	0	151

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and NSF/SRS, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

Appendix table 2-37.
Federal obligations for R&D, by character of work and performer: FYs 1987–97

Character of work and performer	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998 (est.)	1999 (est.)
	Millions of current dollars												
Total R&D	55,253	56,769	61,407	63,560	61,295	65,593	67,314	67,235	68,187	67,655	69,830	72,114	73,333
Federal intramural[a]	13,413	14,115	15,025	15,849	15,138	15,583	16,663	16,132	17,025	16,540	16,720	17,098	17,463
Industrial firms excluding FFRDCs	26,768	26,719	28,548	29,371	26,421	29,745	30,219	30,455	30,236	30,374	31,418	32,313	31,831
FFRDCs administered by industry	1,860	1,911	2,056	2,327	2,168	2,117	1,451	1,294	1,202	1,137	1,128	1,227	1,326
Universities and colleges excluding FFRDCs	7,337	7,828	8,672	9,138	10,169	10,271	11,208	11,797	11,928	11,980	12,561	13,273	14,171
FFRDCs administered by universities	3,210	3,474	3,497	3,450	3,604	3,856	3,614	3,293	3,562	3,447	3,701	3,571	3,894
Nonprofit institutions excluding FFRDCs	1,711	1,683	2,000	2,248	2,637	2,804	2,812	2,937	2,834	2,886	2,962	3,257	3,245
FFRDCs administered by nonprofit institutions	511	506	522	622	679	746	753	736	825	755	821	817	842
State and local government	148	142	167	214	215	184	320	325	317	247	261	310	328
Foreign	296	392	919	343	264	288	272	267	259	288	258	248	234
Basic research	8,942	9,474	10,602	11,286	12,171	12,490	13,399	13,524	13,877	14,464	14,942	15,862	16,914
Federal intramural[a]	2,046	2,050	2,313	2,295	2,392	2,338	2,662	2,498	2,694	2,677	2,689	2,872	3,064
Industrial firms excluding FFRDCs	467	597	733	888	950	920	896	1,110	1,214	1,109	1,167	1,374	1,279
FFRDCs administered by industry	120	133	224	247	264	247	244	238	240	273	295	324	336
Universities and colleges excluding FFRDCs	4,666	4,868	5,221	5,548	6,065	6,332	6,834	6,992	6,944	7,444	7,696	8,067	8,763
FFRDCs administered by universities	907	990	1,098	1,227	1,306	1,394	1,403	1,336	1,439	1,521	1,600	1,585	1,755
Nonprofit institutions excluding FFRDCs	658	729	839	924	1,016	1,097	1,165	1,133	1,148	1,235	1,290	1,401	1,476
FFRDCs administered by nonprofit institutions	13	18	42	59	81	66	71	74	75	76	88	113	105
State and local government	38	43	44	50	49	42	72	75	79	80	68	73	81
Foreign	29	46	47	48	49	54	53	68	45	51	50	53	56
Applied research	8,998	9,176	10,164	10,337	11,798	12,001	13,491	13,888	14,557	13,796	14,423	15,609	16,079
Federal intramural[a]	3,392	3,288	3,584	3,515	4,063	4,186	4,790	4,983	4,991	4,837	4,979	5,378	5,547
Industrial firms excluding FFRDCs	1,982	2,046	2,102	2,304	2,457	2,531	3,028	2,954	3,485	3,160	3,226	3,631	3,507
FFRDCs administered by industry	314	322	381	368	446	438	556	500	572	423	465	480	514
Universities and colleges excluding FFRDCs	1,975	2,155	2,572	2,588	2,803	2,729	3,059	3,299	3,410	3,263	3,477	3,748	3,958
FFRDCs administered by universities	564	575	605	564	855	958	897	845	795	864	999	1,081	1,200
Nonprofit institutions excluding FFRDCs	550	571	681	736	910	953	876	969	930	944	1,005	1,026	1,084
FFRDCs administered by nonprofit institutions	77	65	67	78	90	75	102	104	132	119	129	104	102
State and local government	53	60	78	76	80	67	140	156	143	107	76	96	104
Foreign	93	94	95	107	94	66	44	77	100	77	68	66	63
Development	37,313	38,119	40,641	41,937	37,327	41,102	40,424	39,824	39,752	39,395	40,464	40,644	40,341
Federal intramural	7,975	8,776	9,128	10,039	8,684	9,060	9,212	8,651	9,340	9,027	9,053	8,847	8,852
Industrial firms excluding FFRDCs	24,320	24,077	25,673	26,178	23,014	26,294	26,295	26,391	25,537	26,105	27,026	27,309	27,045
FFRDCs administered by industry	1,426	1,456	1,452	1,713	1,459	1,432	652	556	390	441	369	423	477
Universities and colleges excluding FFRDCs	697	805	879	1,001	1,301	1,211	1,316	1,505	1,574	1,274	1,388	1,458	1,449
FFRDCs administered by universities	1,739	1,909	1,794	1,658	1,443	1,504	1,315	1,112	1,328	1,062	1,102	905	939
Nonprofit institutions excluding FFRDCs	503	383	480	588	712	754	771	835	755	707	667	831	685
FFRDCs administered by nonprofit institutions	421	423	412	484	509	606	580	558	618	560	603	600	634
State and local government	58	39	46	88	86	75	109	95	95	59	117	142	144
Foreign	173	251	777	188	121	168	175	122	114	161	139	129	115

Appendix table 2-37.
Federal obligations for R&D, by character of work and performer: FYs 1987–97

Character of work and performer	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998 (est.)	1999 (est.)
	Millions of constant 1992 dollars												
Total R&D	66,626	66,157	68,657	68,233	63,093	65,593	65,583	63,961	63,341	61,639	62,443	63,722	63,968
Federal intramural	16,174	16,449	16,799	17,014	15,582	15,583	16,235	15,346	15,815	15,070	14,951	15,108	15,233
Industrial firms excluding FFRDCs	32,278	31,137	31,918	31,531	27,196	29,745	29,442	28,972	28,087	27,673	28,094	28,553	27,766
FFRDCs administered by industry	2,243	2,227	2,299	2,498	2,232	2,117	1,414	1,230	1,116	1,036	1,009	1,084	1,157
Universities and colleges excluding FFRDCs	8,847	9,122	9,696	9,809	10,467	10,271	10,920	11,222	11,080	10,915	11,232	11,729	12,361
FFRDCs administered by universities	3,871	4,048	3,910	3,703	3,710	3,856	3,521	3,133	3,308	3,141	3,309	3,155	3,397
Nonprofit institutions excluding FFRDCs	2,063	1,961	2,236	2,414	2,715	2,804	2,740	2,794	2,633	2,630	2,649	2,878	2,831
FFRDCs administered by nonprofit institutions	616	590	584	667	699	746	734	700	766	688	734	722	734
State and local government	178	165	187	230	221	184	312	310	294	225	233	274	286
Foreign	357	457	1,028	368	272	288	265	254	241	263	230	219	204
Basic research	10,783	11,041	11,854	12,116	12,528	12,490	13,054	12,865	12,891	13,178	13,362	14,016	14,754
Federal intramural	2,467	2,389	2,587	2,463	2,462	2,338	2,593	2,376	2,502	2,439	2,404	2,538	2,672
Industrial firms excluding FFRDCs	563	696	820	953	978	920	873	1,056	1,128	1,010	1,043	1,214	1,116
FFRDCs administered by industry	145	155	250	265	272	247	237	226	223	249	264	286	293
Universities and colleges excluding FFRDCs	5,626	5,673	5,838	5,956	6,242	6,332	6,658	6,652	6,450	6,782	6,882	7,128	7,644
FFRDCs administered by universities	1,094	1,154	1,228	1,318	1,345	1,394	1,367	1,271	1,337	1,386	1,431	1,400	1,531
Nonprofit institutions excluding FFRDCs	793	850	938	992	1,045	1,097	1,135	1,078	1,067	1,125	1,153	1,238	1,288
FFRDCs administered by nonprofit institutions	16	21	47	64	83	66	69	71	70	69	79	100	92
State and local government	46	50	49	54	51	42	70	72	73	73	61	64	70
Foreign	35	54	53	51	51	54	52	64	41	46	45	47	48
Applied research	10,850	10,693	11,363	11,097	12,144	12,001	13,144	13,211	13,523	12,569	12,898	13,793	14,025
Federal intramural[a]	4,090	3,832	4,007	3,774	4,182	4,186	4,667	4,741	4,636	4,406	4,452	4,752	4,839
Industrial firms excluding FFRDCs	2,390	2,384	2,350	2,474	2,529	2,531	2,950	2,811	3,237	2,879	2,884	3,208	3,059
FFRDCs administered by industry	379	375	425	395	459	438	541	475	531	386	416	424	448
Universities and colleges excluding FFRDCs	2,382	2,511	2,875	2,779	2,885	2,729	2,980	3,139	3,168	2,973	3,110	3,312	3,453
FFRDCs administered by universities	680	670	677	606	880	958	874	804	738	787	893	955	1,047
Nonprofit institutions excluding FFRDCs	663	665	761	790	937	953	854	922	864	860	899	906	945
FFRDCs administered by nonprofit institutions93	76	75	84	93	75	100	99	123	109	116	92		89
State and local government	64	70	87	82	83	67	136	148	133	98	68	85	91
Foreign	112	110	106	115	97	66	43	73	93	71	61	58	55
Development	44,993	44,423	45,439	45,021	38,422	41,102	39,384	37,885	36,927	35,892	36,184	35,914	35,189
Federal intramural[a]	9,617	10,227	10,205	10,777	8,939	9,060	8,975	8,230	8,676	8,224	8,095	7,818	7,722
Industrial firms excluding FFRDCs	29,326	28,059	28,704	28,103	23,689	26,294	25,619	25,105	23,723	23,783	24,167	24,131	23,591
FFRDCs administered by industry	1,720	1,697	1,623	1,838	1,501	1,432	635	529	362	402	330	374	416
Universities and colleges excluding FFRDCs	840	938	983	1,075	1,339	1,211	1,282	1,432	1,462	1,160	1,241	1,288	1,264
FFRDCs administered by universities	2,097	2,225	2,005	1,780	1,485	1,504	1,281	1,058	1,234	968	986	800	819
Nonprofit institutions excluding FFRDCs	607	446	537	631	732	754	751	794	702	644	597	734	598
FFRDCs administered by nonprofit institutions	508	493	461	520	523	606	565	530	574	510	540	530	553
State and local government	70	45	52	94	88	75	106	90	88	54	105	125	125
Foreign	209	293	869	202	124	168	170	116	106	146	125	114	101

FFRDCs = Federally Funded Research and Development Centers

NOTE: See Appendix table 2-1 for GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

[a]Federal intramural activities cover costs associated with the planning and administration of intramural and extramural programs by federal personnel and actual intramural performance.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development, Detailed Historical Tables: Fiscal Years 1951- 1998*, NSF 98-328 (Arlington, VA: 1998); and NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999, Detailed Statistical Tables*, NSF 99-333 (Arlington, VA: 1999).

Appendix table 2-38.
Estimated Federal obligations for R&D, by selected agency, performer, and character of work: FY 1999
(Millions of current dollars)

Agency	Total	Federal intramural	Industrial firms	FFRDCs administered by industry	Universities and colleges	FFRDCs administered by U&C	Other nonprofit	FFRDCs administered by nonprofits	State and local govt.	Foreign
Total R&D										
Total, all agencies	73,333	17,463	31,831	1,326	14,171	3,894	3,245	842	328	234
Dept. of Agriculture	1,426	995	12	0	403	0	10	0	2	3
Dept. of Commerce	1,036	695	243	0	78	*	13	0	6	1
Dept. of Defense	34,350	7,828	24,027	144	1,373	212	156	516	1	93
Dept. of Energy	6,541	756	1,441	979	598	2,404	65	292	4	2
Dept. of Health & Human Services	14,821	3,080	749	182	8,355	43	2,185	21	153	54
Dept. of the Interior	638	565	17	0	48	0	1	0	6	2
Dept. of Transportation	768	289	306	2	58	5	22	5	82	0
Environmental Protection Agency	610	291	84	0	179	0	53	0	1	1
National Aeronautics & Space Admin	9,201	2,300	4,719	4	719	1,063	341	5	2	47
National Science Foundation	2,655	16	132	0	2,150	156	182	1	7	12
All other agencies	1,288	649	102	15	210	12	216	2	64	18
Basic research										
Total, all agencies	16,914	3,064	1,279	336	8,763	1,755	1,476	105	81	55
Dept. of Agriculture	609	415	5	0	183	0	4	0	1	2
Dept. of Commerce	43	39	0	0	4	0	0	0	0	0
Dept. of Defense	1,106	347	103	2	618	7	22	1	0	8
Dept. of Energy	2,227	99	124	228	463	1,192	29	91	0	1
Dept. of Health & Human Services	7,977	1,321	332	105	4,939	22	1,159	11	60	29
Dept. of the Interior	66	62	0	0	4	0	0	0	0	0
Dept. of Transportation	56	35	13	1	0	5	1	0	1	0
Environmental Protection Agency	57	27	8	0	17	0	5	0	0	0
National Aeronautics & Space Admin	2,127	532	613	1	520	373	79	2	1	6
National Science Foundation	2,442	16	78	0	2,006	156	169	1	6	10
All other agencies	204	172	2	0	11	0	9	0	10	0

Appendix table 2-38.
Estimated Federal obligations for R&D, by selected agency, performer, and character of work: FY 1999
(Millions of current dollars)

Agency	Total	Federal intramural	Industrial firms	FFRDCs administered by industry	Universities and colleges	FFRDCs administered by U&C	Other nonprofit	FFRDCs administered by nonprofits	State and local govt.	Foreign
Applied research										
Total, all agencies	16,079	5,547	3,507	514	3,958	1,200	1,084	102	104	63
Dept. of Agriculture	712	479	7	0	217	0	6	0	1	1
Dept. of Commerce	807	608	126	0	68	3	4	0	1	0
Dept. of Defense	2,982	1,020	1,312	15	465	86	65	12	0	8
Dept. of Energy	1,902	292	118	426	90	877	24	72	1	1
Dept. of Health & Human Services	5,005	1,328	310	55	2,508	18	701	9	58	19
Dept. of the Interior	542	476	15	0	44	0	1	0	5	2
Dept. of Transportation	440	198	156	1	46	0	16	5	17	0
Environmental Protection Agency	453	216	62	0	133	0	40	0	1	1
National Aeronautics & Space Admin	2,217	554	1,281	1	76	207	82	2	0	12
National Science Foundation	212	0	54	0	144	0	12	0	0	2
All other agencies	807	376	67	15	168	9	133	2	18	17
Development										
Total, all agencies	40,341	8,852	27,045	477	1,449	939	685	634	144	115
Dept. of Agriculture	105	101	0	0	4	0	0	0	0	0
Dept. of Commerce	186	48	116	0	6	0	9	0	6	0
Dept. of Defense	30,262	6,461	22,613	127	291	119	69	503	1	78
Dept. of Energy	2,413	365	1,199	325	45	335	12	129	3	1
Dept. of Health & Human Services	1,839	431	107	23	908	3	326	1	34	6
Dept. of the Interior	29	27	2	0	0	0	0	0	0	0
Dept. of Transportation	273	56	136	0	12	0	6	0	63	0
Environmental Protection Agency	100	48	14	0	29	0	9	0	0	0
National Aeronautics & Space Admin	4,858	1,214	2,825	2	123	483	180	0	1	29
National Science Foundation	0	0	0	0	0	0	0	0	0	0
All other agencies	277	101	33	0	32	0	74	0	36	0

* = less than $500,000; FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: These figures reflect funding levels as reported by federal agencies in March through August 1998.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999, Detailed Statistical Tables*, NSF 99–333 (Arlington, VA: 1999).

Appendix table 2-39.
Federal R&D obligations for Federal intramural performance, by selected agency: FYs 1980–99
(Millions of current dollars)

Year	All agencies	Defense	Energy	NASA	HHS	USDA	Commerce	Interior	All other agencies
1980	7,632	3,796	474	965	820	457	226	242	653
1981	8,426	4,281	451	1,044	872	511	237	274	756
1982	9,141	5,139	176	1,166	946	531	242	261	680
1983	10,582	6,401	258	1,134	1,034	559	252	274	670
1984	11,572	7,257	216	1,043	1,066	589	256	334	811
1985	12,945	8,324	224	1,171	1,147	628	280	342	830
1986	13,535	8,881	206	1,217	1,236	630	285	332	749
1987	13,413	8,336	248	1,414	1,293	649	320	355	799
1988	14,115	8,880	245	1,335	1,408	694	316	353	883
1989	15,121	9,295	248	1,733	1,529	689	325	394	907
1990	16,003	9,639	307	1,968	1,662	737	336	424	929
1991	15,238	8,157	381	2,112	1,975	824	400	490	900
1992	15,690	8,601	336	2,210	1,783	862	512	513	872
1993	16,556	8,742	517	2,295	2,033	868	500	522	1,080
1994	16,139	8,017	562	2,271	2,206	931	597	595	959
1995	17,343	8,907	491	2,254	2,485	915	665	492	1,135
1996	16,596	8,148	489	2,258	2,595	900	675	500	1,032
1997	16,720	8,156	425	2,332	2,673	916	664	519	1,035
1998 (est.)	17,098	7,751	535	2,463	2,957	955	695	542	1,200
1999 (est.)	17,463	7,828	756	2,300	3,080	995	695	565	1,246

HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; USDA = Department of Agriculture

NOTE: Intramural activities cover costs associated with the planning and administration of intramural and extramural R&D programs by federal personnel and actual intramural R&D performance.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development, Detailed Historical Tables: Fiscal Years 1951- 1998*, NSF 98–328 (Arlington, VA: 1998); and NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999,* Detailed Statistical Tables, NSF 99–333 (Arlington, VA: 1999).

Science & Engineering Indicators - 2000

Appendix table 2-40.
Federal R&D obligations to FFRDCs, by administering sector and selected sponsoring agency: FYs 1987–99
(Millions of current dollars)

	All agencies	Defense	Energy	NASA	All other agencies
Total					
1987	5,580	1,462	3,410	476	233
1988	5,891	1,541	3,572	560	217
1989	6,075	1,386	3,728	633	328
1990	6,425	1,494	3,895	622	415
1991	6,451	1,396	3,948	738	369
1992	6,718	1,537	3,996	793	392
1993	5,871	1,239	3,521	688	424
1994	5,322	856	3,310	778	378
1995	5,610	823	3,296	1,048	443
1996	5,339	831	3,017	1,107	384
1997	5,650	844	3,289	1,115	403
1998 (est.)	5,614	840	3,406	969	399
1999 (est.)	6,062	872	3,676	1,072	443
FFRDCs administered by industry					
1987	1,860	325	1,475	0	61
1988	1,911	316	1,536	0	60
1989	2,056	309	1,588	0	160
1990	2,327	419	1,718	0	190
1991	2,168	316	1,690	0	162
1992	2,117	335	1,607	0	175
1993	1,451	202	1,094	0	156
1994	1,294	116	1,011	0	167
1995	1,204	93	936	0	175
1996	1,137	82	873	12	170
1997	1,128	94	853	4	177
1998 (est.)	1,227	133	907	4	182
1999 (est.)	1,326	144	979	4	199
FFRDCs administered by universities and colleges					
1987	3,210	737	1,839	475	158
1988	3,474	829	1,945	560	141
1989	3,497	686	2,033	630	148
1990	3,466	658	2,020	619	168
1991	3,604	637	2,072	736	159
1992	3,856	668	2,227	791	169
1993	3,667	545	2,205	685	232
1994	3,293	275	2,077	771	170
1995	3,574	262	2,057	1,044	212
1996	3,448	252	1,934	1,090	172
1997	3,701	251	2,156	1,106	189
1998 (est.)	3,571	213	2,207	961	190
1999 (est.)	3,894	212	2,404	1,063	215
FFRDCs administered by other nonprofit institutions					
1987	511	400	96	1	14
1988	506	397	91	1	16
1989	522	391	107	3	20
1990	632	416	157	2	57
1991	679	442	186	2	49
1992	746	534	163	2	47
1993	753	492	222	2	37
1994	736	466	222	7	41
1995	831	468	303	4	57
1996	755	496	211	5	42
1997	821	500	280	5	37
1998 (est.)	817	494	292	5	27
1999 (est.)	842	516	292	5	29

FFRDCs = Federally Funded Research and Development Centers; NASA = National Aeronautics and Space Administration

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development, Detailed Historical Tables: Fiscal Years 1951- 1998*, NSF 98–328 (Arlington, VA: 1998); NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999, Detailed Statistical Tables*, NSF 99–333 (Arlington, VA: 1999); and unpublished tabulations.

Appendix table 2-41.
Federal obligations for R&D to federally funded research and development centers, by individual FFRDC and agency: FY 1997
(Thousands of dollars)

FFRDC	Total	Commerce	Defense	Energy	HHS	NASA	NSF	Other agencies
TOTAL, ALL FFRDCs	5,650,207	80	844,165	3,288,799	212,722	1,114,610	131,801	58,030
FFRDCs administered by industrial firms	1,128,234	0	93,508	853,307	156,946	4,046	0	20,427
Idaho National Engineering Laboratory	62,770	0	4,801	50,693	0	90	0	7,186
NCI Frederick Cancer R&D Center	156,946	0	0	0	156,946	0	0	0
Oak Ridge National Laboratory	233,785	0	4,910	220,061	0	3,050	0	5,764
Sandia National Laboratories	657,549	0	83,788	565,378	0	906	0	7,477
Savannah River Technology Center	17,184	0	9	17,175	0	0	0	0
FFRDCs administered by universities & colleges	3,701,010	80	250,754	2,155,640	37,706	1,105,958	131,260	19,612
Ames Laboratory	20,448	0	1,563	18,885	0	0	0	0
Argonne National Laboratory	243,714	3	3,346	234,043	0	264	0	6,058
Brookhaven National Laboratory	222,326	13	677	211,221	3,845	30	1,148	5,392
Ernest Orlando Lawrence Berkeley National Laboratory	231,110	75	2,284	210,512	16,799	1,341	174	0
Fermi National Accelerator Laboratory	184,468	0	0	184,468	0	0	0	0
Jet Propulsion Laboratory	1,123,854	0	24,753	0	0	1,099,005	96	0
Lawrence Livermore National Laboratory	563,586	0	29,262	528,405	3,339	1,903	128	549
Lincoln Laboratory	155,294	0	155,144	0	0	150	0	0
Los Alamos National Laboratory	564,135	3	15,628	527,382	13,446	65	96	7,515
National Astronomy & Ionosphere Center	8,244	0	0	0	0	0	8,244	0
National Center for Atmospheric Research	60,560	53	160	0	0	3,200	57,147	0
National Optical Astronomy Observatories	33,264	0	0	0	0	0	33,264	0
National Radio Astronomy Observatory	30,813	0	0	0	0	0	30,813	0
Oak Ridge Institute for Science & Education	9,526	8	0	8,993	277	0	150	98
Princeton Plasma Physics Laboratory	52,595	0	242	52,353	0	0	0	0
Software Engineering Institute	16,395	0	16,395	0	0	0	0	0
Stanford Linear Accelerator Center	118,244	0	0	118,244	0	0	0	0

Appendix table 2-41.
Federal obligations for R&D to federally funded research and development centers, by individual FFRDC and agency: FY 1997
(Thousands of dollars)

FFRDC	Total	Commerce	Defense	Energy	HHS	NASA	NSF	Other agencies
Thomas Jefferson National Accelerator Facility	62,434	0	1,300	61,134	0	0	0	0
FFRDCs administered by other nonprofit institutions	820,963	0	499,903	279,852	18,070	4,606	541	17,991
Aerospace FFRDC	215,125	0	213,867	0	0	1,107	151	0
Arroyo Center	16,779	0	16,779	0	0	0	0	0
C3I Federally Funded Research & Development Center	163,010	0	162,532	0	350	0	128	0
Center for Advanced Aviation System Development	8,605	0	3,015	0	0	0	0	5,590
Center for Naval Analyses	41,767	0	41,675	0	0	0	92	0
Critical Technologies Institute	60	0	60	0	0	0	0	0
Institute for Defense Analyses Studies & Analyses FFRDC	32,061	0	31,923	0	0	0	138	0
Logistics Management Institute	4,963	0	1,689	0	0	3,274	0	0
National Defense Research Institute	11,822	0	1,135	0	10,617	70	0	0
National Renewable Energy Laboratory	148,404	0	50	148,354	0	0	0	0
Pacific Northwest National Laboratory	145,928	0	4,739	131,498	7,103	155	32	2,401
Project Air Force	21,000	0	21,000	0	0	0	0	0
Tax Systems Modernization Institute	10,000	0	0	0	0	0	0	10,000

FFRDC = Federally Funded Research and Development Center; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999, Detailed Statistical Tables, NSF 99-333 (Arlington, VA: 1999).

Appendix table 2-42.
Federal R&D laboratory campuses, by agency and state: FY 1995

Federal agency	Number of laboratory campuses	1995 (millions)
Total	515	26,578.8
Department of Agriculture	185	733.4
Agricultural Research Service	107	556.1
Forest Service	78	177.3
Department of Commerce	38	430.3
Nat. Inst. of Standards & Tech.	2	199.9
Nat. Oceanic & Atmos. Admin.	36	230.4
Department of Defense	68	9,150.8
Dept. of the Air Force	11	1,824.0
Dept. of the Army	29	2,076.3
Dept. of the Navy	21	4,668.2
Other Defense agencies	7	582.3
Department of Education	10	41.0
Department of Energy	33	8,080.7
Defense Programs	3	3,203.3
Energy research	16	2,670.6
Energy efficiency & renewable	1	237.6
Environmental management	3	904.0
Fossil energy	6	445.7
Naval reactors	2	585.0
Nonproliferation	1	5.0
Office of the Sec. of Energy	1	29.5
Dept. of Health & Human Services	19	1,371.4
Centers for Disease Ctrl. & Prev.	6	108.6
Food and Drug Administration	3	40.2
National Institutes of Health	10	1,222.6
Department of the Interior	20	547.4
Bureau of Reclamation	1	71.3
National Biological Service	16	105.1
U.S. Geological Survey	3	371.0
Department of Justice—DEA	2	1.0
Department of Transportation	6	536.2
Federal Aviation Administration	3	211.7
Federal Highway Administration	1	125.5
Nat. Highway Traf. Safety Admin.	1	0.8
Research & Spec Prog Admin.	1	198.2
Department of the Treasury—IRS	1	1.5
Department of Veterans Affairs	102	270.0
Environ. Protection Agency (R&D)	11	348.2
Nat. Aeronautics & Space Admin.	10	4,833.7
Aeronautics	4	1,370.7
Mission to Planet Earth	1	646.5
Space flight	4	2,032.8
Space science	1	783.7
National Science Foundation	5	173.4
Nuclear Regulatory Commission	1	16.0
Smithsonian Institution	2	17.5
Tennessee Valley Authority	2	27.3

State	Number of laboratory campuses	1995 (millions)
Total	515	26,578.8
Alabama	11	992.3
Alaska	10	33.8
Arizona	8	125.2
Arkansas	7	32.1
California	46	4,119.7
Colorado	13	575.3
Connecticut	5	18.6
Delaware	1	1.0
Florida	21	848.6
Georgia	14	132.8
Hawaii	6	21.2
Idaho	8	816.9
Illinois	15	727.7
Indiana	3	11.3
Iowa	4	64.8
Kansas	3	6.8
Kentucky	2	2.6
Louisiana	8	39.8
Maine	1	0.4
Maryland	25	2,921.2
Massachusetts	15	1,005.3
Michigan	8	101.8
Minnesota	7	33.9
Mississippi	13	285.1
Missouri	8	71.4
Montana	6	21.0
Nebraska	4	19.9
Nevada	3	28.4
New Hampshire	3	31.4
New Jersey	8	592.1
New Mexico	9	2,693.5
New York	19	680.1
North Carolina	13	240.4
North Dakota	5	24.6
Ohio	12	705.2
Oklahoma	10	142.3
Oregon	14	83.3
Pennsylvania	14	578.7
Rhode Island	5	416.3
South Carolina	10	122.2
South Dakota	2	2.2
Tennessee	8	844.9
Texas	22	910.6
Utah	7	75.2
Vermont	2	3.8
Virginia	19	3,964.4
Washington	19	617.9
West Virginia	9	228.0
Wisconsin	9	42.0
Wyoming	3	4.7
Washington, D.C.	9	487.3
Puerto Rico	4	15.8
Foreign countries[b]	5	14.0

DEA = Drug Enforcement Administration; IRS = Internal Revenue Service

NOTES: Data for the Department of Defense and the National Aeronautics and Space Administration are from their FY 1994 operating budgets; data for the Department of Education are from its FY 1996 operating budget.

[a]Data for the Food and Drug Administration exclude product testing activities.

[b]The Agricultural Research Service has R&D laboratories in Argentina, France, and Panama. The Navy has medical labs in Egypt and Indonesia.

SOURCE: U.S. General Accounting Office, *Federal R&D Laboratories*, GAO/RCED/NSIAD–96–78R (Washington, DC: 1996).

Appendix table 2-43.
Independent research and development (IR&D) support: FYs 1963–98
(Millions of current dollars)

Year	Incurred by industry[a]	Accepted by government IR&D program: Total accepted	DOD share	NASA share	Not reimbursed	Not accepted under IR&D program	DOD and NASA IR&D reimbursement	R&D obligations[b]: DOD to Industry	NASA to industry	IR&D as a percent of federal R&D to industry[c]: DOD & NASA (1)	DOD (2)
1963	439	255	197	24	34	184	221	5,173	2,307	3.0	3.8
1964	419	272	199	50	23	147	249	4,880	3,369	3.0	4.1
1965	439	300	198	60	42	139	258	4,362	3,853	3.1	4.5
1966	502	357	224	69	64	145	293	4,557	3,928	3.5	4.9
1967	591	439	277	58	104	152	335	5,428	3,798	3.6	5.1
1968	776	579	338	61	180	197	399	5,090	3,382	4.7	6.6
1969	808	653	410	43	200	155	453	5,157	2,899	5.6	8.0
1970	753	597	376	44	177	156	420	4,524	2,521	6.0	8.3
1971	703	567	354	41	172	136	395	4,629	2,077	5.9	7.6
1972	936	725	392	40	293	211	432	5,108	1,960	6.1	7.7
1973	1,164	876	441	40	395	288	481	5,138	1,961	6.8	8.6
1974	1,175	921	467	39	415	254	506	5,173	1,785	7.3	9.0
1975	1,224	1,010	493	40	477	214	533	5,640	1,792	7.2	8.7
1976	1,388	1,061	544	41	476	327	585	6,019	2,042	7.3	9.0
1977	1,560	1,199	598	46	555	361	644	6,997	2,002	7.2	8.5
1978	1,788	1,365	643	49	673	423	692	7,317	2,043	7.4	8.8
1979	2,104	1,517	708	54	755	587	762	7,695	2,270	7.6	9.2
1980	2,373	1,728	812	57	859	645	869	9,022	1,924	7.9	9.0
1981	2,796	2,039	1,056	66	917	757	1,122	10,826	2,096	8.7	9.8
1982	3,654	2,821	1,338	67	1,416	833	1,405	13,795	1,433	9.2	9.7
1983	4,017	2,961	1,601	78	1,282	1,056	1,679	14,541	1,030	10.8	11.0
1984	5,173	3,897	1,884	86	1,927	1,276	1,970	15,967	1,263	11.4	11.8
1985	5,036	3,500	2,099	88	1,313	1,536	2,187	18,944	1,576	10.7	11.1
1986	5,042	3,537	2,198	77	1,262	1,505	2,275	21,502	1,584	9.9	10.2
1987	4,885	3,544	2,186	67	1,291	1,341	2,253	23,934	1,463	8.9	9.1
1988	4,825	3,694	2,181	89	1,424	1,131	2,270	23,295	1,962	9.0	9.4
1989	4,866	3,798	2,233	110	1,455	1,068	2,343	24,734	2,426	8.6	9.0
1990	4,910	3,766	2,158	131	1,477	1,144	2,289	24,443	3,285	8.3	8.8
1991	5,099	4,327	2,203	133	1,991	772	2,336	21,034	3,667	9.5	10.5
1992	4,903	4,320	2,117	84	2,119	583	2,201	24,107	3,765	7.9	8.8
1993	3,337	3,085	1,904	151	1,030	252	2,055	23,654	4,112	7.4	8.0
1994	3,068	2,842	1,746	167	929	226	1,913	23,408	4,305	6.9	7.5
1995	2,848	2,720	1,619	167	934	128	1,786	22,645	4,687	6.5	7.1

Appendix table 2-43.
Independent research and development (IR&D) support: FYs 1963–98
(Millions of current dollars)

Year	Incurred by industry[a]	Accepted by government IR&D program: Total accepted	DOD share	NASA share	Not reimbursed	Not accepted under IR&D program	DOD and NASA IR&D reimbursement	R&D obligations[b]: DOD to Industry	NASA to industry	IR&D as a percent of federal R&D to industry[c]: DOD & NASA (1)	DOD (2)
1996	3,009	2,850	1,736	172	942	159	1,908	23,716	4,200	6.8	7.3
1997	2,822	2,675	1,678	NA	NA	147	NA	24,390	4,770	NA	6.9
1998	2,885	2,735	1,628	NA	NA	150	NA	24,518	5,289	NA	6.6

NA = not available; DOD = Department of Defense; IR&D = independent research and development; NASA = National Aeronautics and Space Administration

NOTES: The significant decrease in reported statistics between FYs 1992 and 1993 is primarily due to (1) change in the Federal Acquisition Regulations definition of "major contractor" and (2) change in the Defense Contract Audit Agency criteria used in determining contractors to be reported. Previously, these criteria included contractors with auditable costs of $40 million or more; the current threshold is $70 million or more. The increase in the percentage of IR&D costs accepted is due to an expansion of the activities eligible for reimbursement.

[a]IR&D costs incurred by industry would be reported as R&D funding from industry's own sources, not as Federal R&D support.

[b]Includes R&D performed by Federally Funded Research and Development Centers administered by the industrial sector.

[c]Percentages were calculated as follows: numerator in (1) is total DOD and NASA IR&D reimbursements, and denominator is total DOD and NASA R&D obligations to industry, excluding IR&D; numerator in (2) is total DOD IR&D reimbursements, and denominator is DOD R&D obligations to industry, excluding IR&D.

SOURCES: Defense Contract Audit Agency, *Independent Research and Development and Bid and Proposal Costs Incurred by Major Defense Contractors 1976- 98* (Washington, DC: annual series); NASA, unpublished tabulations; J. Reppy, "Defense Department Payments for 'Company–Financed' R&D," Research Policy Vol. 6, No. 4 (October 1977): p. 403; National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development, Detailed Historical Tables: Fiscal Years 1951- 1999*, NSF 99–347 (Arlington, VA: 1999); and NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999, Detailed Statistical Tables*, NSF 99–333 (Arlington, VA: 1999).

Appendix table 2-44.
Small Business Innovation Research awards, by award type and agency: FYs 1983–97
(Millions of current dollars)

Award type and agency	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Cumulative 1983–97
Total[a]	45	108	199	298	351	389	432	461	483	508	698	718	865	916	1,107	7,578
By type																
Phase I awards	45	48	69	99	110	102	108	118	128	128	154	220	232	229	278	2,068
Phase II awards	0	60	130	199	241	285	322	342	336	371	491	474	602	646	789	5,288
By agency																
Defense	20	45	78	151	194	208	233	241	241	242	385	354	414	479	569	3,854
Health and Human Services	7	23	45	57	67	73	79	84	93	102	126	133	181	189	252	1,511
National Aeronautics and Space Administration	5	13	29	36	32	47	52	62	69	79	86	116	118	114	121	979
Energy	5	16	26	29	28	30	33	39	39	43	50	53	70	62	75	598
National Science Foundation	5	7	10	15	17	17	19	20	22	23	29	34	42	41	54	355
Agriculture	1	2	3	4	4	4	4	4	5	6	7	7	9	9	10	79
Transportation	*	2	3	4	3	3	4	4	6	3	4	7	10	7	8	68
Environmental Protection Agency	*	1	2	3	3	3	3	3	4	4	5	5	7	5	6	54
Education	*	1	1	2	2	2	2	2	3	2	3	3	3	3	4	33
Nuclear Regulatory Commission	*	1	1	1	1	1	1	1	0	1	2	1	2	0	0	13
Commerce	0	0	0	1	2	1	1	1	1	2	2	4	8	6	7	36
Interior	*	1	*	0	0	0	0	0	0	0	0	0	0	0	0	1

* = less than $500,000

[a]Totals are Small Business Innovation Research award obligations that include award modifications. The details by award type and agency do not necessarily contain subsequent year revisions and may not sum to totals.

SOURCE: U.S. Small Business Administration, *Small Business Innovation Development Act* (Washington, DC: annual series).

Appendix table 2-45.
Budgetary impact of the Federal research and experimentation tax credit: FYs 1981–99
(Millions of dollars)

Year	Outlay equivalent cost of credit (current $)[a]	Total Federal R&D outlays (current $)	Ratio of credit outlays to R&D (%)	Outlay equivalent cost of credit (constant $)[a]
1981	205	32,459	0.63	314
1982	640	34,391	1.86	917
1983	1,010	36,659	2.76	1,384
1984	3,360	39,691	8.47	4,433
1985	2,430	44,171	5.50	3,099
1986	2,295	50,609	4.53	2,847
1987	2,715	51,612	5.26	3,275
1988	1,240	54,739	2.27	1,445
1989	1,590	59,450	2.67	1,779
1990	1,625	62,135	2.62	1,744
1991	1,070	61,130	1.75	1,101
1992	1,850	62,934	2.94	1,850
1993	1,900	65,241	2.91	1,852
1994	2,110	66,151	3.19	2,008
1995	1,820	66,371	2.74	1,691
1996	1,245	65,910	1.89	1,134
1997	1,360	68,897	1.97	1,216
1998	3,270	69,849	4.68	2,889
1999	2,550	71,112	3.59	2,225

NOTES: Tax expenditure estimates are prepared by the U.S. Treasury Department, based on the income tax law enacted as of December 31 of the year for which the expenditures are reported. Expenditures for the years 1998–99 are estimated based on the income tax law enacted as of December 31, 1998. See appendix table 2-1 for GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

[a] "Outlay equivalent" estimates are comparable to taxable outlay figures reported in the budget. This allows for a comparison of the resource cost of the tax credit with the cost of direct federal R&D expenditure support.

SOURCE: U.S. Office of Management and Budget, *Budget of the United States Government* (Washington, DC: U.S. Government Printing Office, annual series).

See figure 2-10 in Volume I.

Appendix table 2–46.
Estimated Federal obligations for research, by agency and field of science and engineering: FY 1997
(Thousands of current dollars)

Agency	Total	Life sciences	Psychology	Physical sciences	Environmental sciences	Math & computer sciences	Engineering	Social sciences	Other sciences
Total, all agencies	29,365,587	12,661,324	545,366	4,148,717	3,045,653	1,671,848	5,690,260	696,298	906,121
Dept. of Agriculture	1,290,106	988,828	356	93,359	12,781	14,177	59,873	117,507	3,225
Dept. of Commerce	808,058	139,420	406	107,499	257,275	78,946	169,957	18,225	36,330
Dept. of Defense	3,809,817	291,299	77,171	379,532	374,358	605,184	1,933,425	886	147,962
Dept. of Education	138,077	9,631	6,311	0	0	996	6,643	114,496	0
Dept. of Energy	3,567,697	220,896	0	1,756,798	350,843	411,502	802,536	0	25,122
Dept. of Health & Human Services	11,228,052	9,721,330	392,026	166,615	32165	103,322	152,259	165,743	494,592
Dept. of Housing & Urban Development	11,265	0	0	0	38	211	279	9,265	1472
Dept. of the Interior	552,655	140,234	0	41,555	316,872	18,613	21,177	14,204	0
Dept. of Justice	32,485	1,000	1100	600	0	0	400	23,298	6,087
Dept. of Labor	21,747	0	0	0	0	109	0	21,638	0
Dept. of State	976	0	0	0	0	0	0	976	0
Dept. of Transportation	381,205	8,966	29,616	49,291	11,298	14,563	223,662	11,099	32,710
Dept. of the Treasury	50,861	79	295	1,862	0	10,120	3	38502	0
Dept. of Veterans Affairs	230,981	217,508	13,345	0	0	0	128	0	0
Advisory Com. on Intergov. Relations, Agency for International Development	176,664	159,242	0	0	0	0	0	15,099	2,323
Appalachian Regional Commission	900	0	0	0	0	0	0	900	0
Environmental Protection Agency	409,109	113,098	0	0	175,075	0	120,936	0	0
Federal Communications Commission	3,099	0	0	85	0	112	1,536	1366	0
Federal Trade Commission	696	0	0	0	0	0	0	696	0
International Trade Commission	5,677	0	0	0	0	0	0	5,677	0
Library of Congress	796	0	0	0	0	0	0	0	796
National Aeronautics & Space Administration	4,184,887	268,165	19,451	1,034,197	1,061,120	80,702	1,692,628	386	28,238
National Archives & Records Administration	120	0	0	120	0	0	0	0	0
National Science Foundation	2,248,520	330,477	5,234	477,926	445,719	333,291	442,504	87,997	125,372
Nuclear Regulatory Commission	62,102	0	0	0	0	0	62,102	0	0
Smithsonian Institution	130,000	49,472	0	38,204	5,988	0	0	34,594	1,742
Tennessee Valley Authority	3,987	1,546	0	696	1,695	0	0	0	0
U.S. Arms Control & Disarmament Agency	1,200	60	0	378	426	0	60	126	150
United States Information Agency	152	0	0	0	0	0	152	0	0

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999* (Arlington, VA: NSF 99-333).

Appendix table 2-47.
Federal obligations for basic research, by agency and field of science and engineering: FYs 1985–99

Field	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Preliminary 1998	Preliminary 1999
							Millions of current dollars[a]								
Total, all fields	7,819	8,153	8,942	9,474	10,602	11,286	12,171	12,490	13,399	13,524	13,877	14,464	14,942	15,862	16,914
Life sciences	3,787	3,859	4,362	4,502	4,916	5,178	5,434	5,842	6,289	6,472	6,601	6,879	7,204	7,688	8,322
Biological & agricultural, total	2,516	2,543	2,870	2,855	3,103	3,219	3,375	3,518	3,788	3,752	3,837	3,922	3,945	NA	NA
Biological (excl. environmental)	2,106	2,152	2,462	2,415	2,647	2,742	2,869	2,982	3,223	3,139	3,248	3,387	3,391	NA	NA
Environmental biology	126	126	141	147	157	168	187	202	223	242	221	206	206	NA	NA
Agricultural	284	266	268	294	298	309	319	334	342	371	368	330	348	NA	NA
Medical sciences, total	1,145	1,197	1,341	1,573	1,708	1,850	1,858	2,131	2,381	2,610	2,616	2,741	3,035	NA	NA
Other life sciences	126	119	151	73	104	109	201	193	120	110	149	216	223	NA	NA
Psychology	133	133	147	178	187	215	226	123	247	246	278	292	294	304	332
Physical sciences	1,815	1,914	2,096	2,200	2,507	2,662	2,882	2,951	2,907	2,827	2,865	2,863	2,976	3,127	3,305
Astronomy	401	453	505	459	525	580	612	730	663	725	732	709	754	NA	NA
Chemistry	425	433	445	471	505	502	539	557	544	540	559	551	518	NA	NA
Physics	960	1,003	1,072	1,206	1,395	147	1,645	1,608	1,601	1,502	1,507	1,546	1,562	NA	NA
Other physical sciences	30	25	74	65	82	105	86	58	99	60	66	57	143	NA	NA
Environmental sciences	700	749	781	873	1,017	1,275	1,264	1,304	1,534	1,517	1,468	1,554	1,543	1,641	1,675
Atmospheric science	209	240	244	281	316	444	449	435	635	698	688	671	680	NA	NA
Geological	250	266	266	267	335	440	499	527	555	488	452	390	388	NA	NA
Oceanography	219	224	250	269	294	300	198	210	207	190	188	309	304	NA	NA
Other environmental sciences	21	19	21	55	72	92	118	132	136	140	139	184	172	NA	NA
Mathematics & computer sciences	260	293	306	313	346	407	426	481	511	522	603	640	661	700	787
Mathematics	130	142	158	165	168	176	164	228	222	248	164	163	238	NA	NA
Computer sciences	116	131	129	126	160	225	224	248	284	262	317	377	390	NA	NA
Other mathematics & computer sciences	14	20	20	22	18	5	38	6	5	12	122	100	34	NA	NA
Social sciences	141	114	130	147	155	146	161	140	194	184	207	213	221	239	266
Anthropology	16	11	12	12	12	13	13	11	10	10	15	13	15	NA	NA
Economics	34	26	29	35	38	37	37	39	46	38	45	39	46	NA	NA
Political science	6	4	6	5	5	6	7	6	6	5	7	6	5	NA	NA
Sociology	32	30	34	37	38	24	28	10	11	13	14	13	8	NA	NA
Other social sciences	52	42	48	58	61	66	76	73	121	118	126	141	147	NA	NA
Other sciences.	100	122	131	256	292	302	546	399	510	466	407	413	459	468	514

Appendix table 2-47.
Federal obligations for basic research, by agency and field of science and engineering: FYs 1985–99

Field	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Preliminary 1998	Preliminary 1999
Millions of current dollars															
Engineering	884	969	990	1,006	1,184	1,102	1,234	1,250	1,207	1,290	1,449	1,612	1,583	1,696	1,713
Aeronautical	192	226	237	231	328	270	256	245	246	276	271	262	269	NA	NA
Astronautical	42	53	49	48	59	62	70	94	54	60	66	72	70	NA	NA
Chemical	74	73	78	89	50	76	102	105	73	71	67	60	68	NA	NA
Civil	44	45	46	46	52	47	59	53	39	38	70	53	45	NA	NA
Electrical	145	156	175	154	174	147	143	165	203	206	205	202	173	NA	NA
Mechanical	88	84	87	84	101	91	116	114	143	142	165	113	105	NA	NA
Metallurgy & materials	212	229	210	230	255	260	295	274	241	330	369	502	463	NA	NA
Other engineering	88	103	108	124	166	148	194	199	209	168	237	349	390	NA	NA
Millions of constant 1992 dollars[a]															
Total, all fields	9,977	10,115	10,783	11,040	11,854	12,116	12,528	12,490	13,054	12,865	12,891	13,178	13,361	14,016	14,754
Life sciences	4,832	4,788	5,260	5,246	5,496	5,558	5,593	5,842	6,127	6,157	6,132	6,267	6,442	6,793	7,259
Biological & agricultural, total	3,210	3,155	3,461	3,327	3,469	3,456	3,474	3,518	3,690	3,569	3,564	3,574	3,528	NA	NA
Biological (excl. environmental)	2,687	2,670	2,968	2,814	2,960	2,944	2,953	2,982	3,140	2,986	3,017	3,086	3,032	NA	NA
Environmental biology	161	156	170	171	176	181	192	202	217	230	205	187	184	NA	NA
Agricultural	362	330	323	342	334	331	329	334	333	353	341	300	311	NA	NA
Medical sciences, total	1,461	1,485	1,617	1,833	1,910	1,986	1,912	2,131	2,320	2,483	2,430	2,497	2,714	NA	NA
Other life sciences	161	148	182	85	117	117	207	193	117	105	138	197	200	NA	NA
Psychology	170	165	177	207	209	231	232	123	240	234	258	266	263	269	290
Physical sciences	2,316	2,375	2,527	2,563	2,802	2,857	2,966	2,951	2,832	2,689	2,661	2,608	2,662	2,763	2,883
Astronomy	512	562	608	534	587	623	630	730	646	689	680	646	674	NA	NA
Chemistry	542	537	537	549	564	539	555	557	530	514	520	502	463	NA	NA
Physics	1,225	1,244	1,293	1,405	1,560	158	1,693	1,608	1,559	1,429	1,400	1,408	1,397	NA	NA
Other physical sciences	38	31	89	76	92	113	88	58	97	57	62	52	128	NA	NA
Environmental sciences	893	929	942	1,017	1,137	1,369	1,301	1,304	1,494	1,443	1,363	1,416	1,380	1,450	1,462
Atmospheric science	267	298	294	327	354	476	462	435	619	664	639	612	608	NA	NA
Geological	319	330	321	312	374	472	514	527	541	464	420	355	347	NA	NA
Oceanography	279	278	301	314	328	322	203	210	202	181	175	282	271	NA	NA
Other environmental sciences	27	24	26	64	81	98	121	132	132	133	129	167	154	NA	NA

Appendix table 2-47.
Federal obligations for basic research, by agency and field of science and engineering: FYs 1985–99

Field	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Preliminary 1998	Preliminary 1999
							Millions of constant 1992 dollars[a]								
Mathematics & computer sciences	332	364	369	365	387	437	439	481	498	496	560	583	591	618	686
Mathematics	166	176	191	193	188	189	169	228	216	236	152	148	213	NA	NA
Computer sciences	148	163	155	146	178	242	230	248	277	250	295	343	348	NA	NA
Other mathematics & computer sciences	18	25	24	26	21	6	39	6	5	11	113	91	30	NA	NA
Social sciences	180	141	156	171	173	157	166	140	189	175	192	194	198	211	232
Anthropology	20	14	15	14	14	13	13	11	10	9	14	12	13	NA	NA
Economics	43	32	35	40	42	40	38	39	45	37	42	36	41	NA	NA
Political science	8	5	7	6	6	7	7	6	6	5	7	5	4	NA	NA
Sociology	41	37	41	43	43	26	29	10	11	12	13	12	7	NA	NA
Other social sciences	66	52	58	68	68	71	78	73	117	112	117	129	131	NA	NA
Other sciences	128	151	158	298	326	325	562	399	497	443	378	376	411	413	448
Engineering	1,128	1,202	1,193	1,173	1,323	1,183	1,270	1,250	1,176	1,228	1,346	1,469	1,416	1,499	1,494
Aeronautical	245	280	286	269	367	289	264	245	240	262	252	238	241	NA	NA
Astronautical	54	66	59	56	66	67	72	94	52	57	62	65	62	NA	NA
Chemical	94	91	93	103	56	81	105	105	71	67	62	54	61	NA	NA
Civil	56	56	55	54	58	51	61	53	38	36	65	48	41	NA	NA
Electrical	185	194	212	179	194	158	147	165	198	196	190	184	155	NA	NA
Mechanical	112	104	105	97	113	98	119	114	139	135	153	103	94	NA	NA
Metallurgy & materials	271	284	253	268	285	279	303	274	235	314	342	457	414	NA	NA
Other engineering	112	128	130	145	185	159	200	199	204	160	220	318	349	NA	NA

NA = not available

[a] See Appendix table 2-1 for GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development, Detailed Historical Tables: Fiscal Years 1951-98*, NSF 98-328 (Arlington, VA: 1998); and NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999; Detailed Statistical Tables*, NSF 99-333 (Arlington, VA: 1999).

See figure 2-20 in Volume I.

Appendix table 2-48.
Federal obligations for applied research, by agency and field of science and engineering: FYs 1985–99

Field	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Preliminary 1998	Preliminary 1999
							Millions of current dollars								
Total, all fields	8,315	8,349	8,999	9,176	10,163	10,337	11,798	12,001	13,491	13,888	14,557	13,796	14,423	15,609	16,079
Life sciences	2,576	2,606	2,980	3,223	3,579	3,652	4,188	4,069	4,483	4,812	5,210	5,185	5,458	5,933	6,064
Biological & agricultural, total	1,240	1,318	1,488	1,718	1,917	1,959	2,223	2,116	2,272	2,351	2,566	2,708	2,599	NA	NA
Biological (excl. environmental)	779	842	1,041	1,267	1,336	1,403	1,589	1,453	1,567	1,607	1,677	1,923	1,929	NA	NA
Environmental biology	135	138	149	154	210	174	273	309	333	388	586	498	376	NA	NA
Agricultural	326	338	299	297	371	383	361	353	371	357	303	287	293	NA	NA
Medical sciences, total	1,223	1,164	1,324	1,368	1,514	1,533	1,603	1,779	2,024	2,252	2,356	2,233	2,498	NA	NA
Other life sciences	113	123	168	137	148	160	363	174	188	209	287	245	361	NA	NA
Psychology	194	201	222	212	235	234	257	176	304	302	345	234	252	274	280
Physical sciences	1,231	1,155	1,157	1,118	1,199	1,147	1,354	1,488	1,520	1,427	1,414	1,060	1,172	1,208	1,273
Astronomy	14	15	18	12	17	17	19	9	23	23	33	20	21	NA	NA
Chemistry	225	229	235	232	278	260	290	340	300	334	304	330	328	NA	NA
Physics	856	803	781	770	795	781	816	971	1,038	941	944	446	506	NA	NA
Other physical sciences	135	108	122	103	108	90	229	168	160	129	133	264	318	NA	NA
Environmental sciences	704	733	731	734	756	899	886	904	1,075	1,322	1,387	1,466	1,502	1,647	1,585
Atmospheric science	277	281	309	307	272	330	354	332	349	397	447	415	485	NA	NA
Geological	179	178	176	174	208	221	230	209	243	350	397	394	304	NA	NA
Oceanography	179	205	178	191	198	220	201	249	260	307	219	265	294	NA	NA
Other environmental sciences	69	68	68	62	78	128	102	114	223	268	324	392	420	NA	NA
Mathematics & computer sciences	315	322	334	330	390	434	478	679	714	780	976	932	1,010	1,131	1,468
Mathematics	53	42	46	52	68	65	63	91	69	95	95	92	63	NA	NA
Computer sciences	164	171	169	167	205	337	361	524	542	568	697	743	875	NA	NA
Other mathematics & computer sciences	97	109	119	110	116	32	53	64	103	117	185	97	72	NA	NA
Social sciences	319	302	351	339	396	484	566	550	481	463	472	442	475	585	617
Anthropology	2	2	3	2	2	2	3	3	4	7	7	6	6	NA	NA
Economics	125	105	120	125	129	160	150	172	159	155	162	155	158	NA	NA
Political science	9	8	6	7	8	7	10	16	23	21	15	11	10	NA	NA
Sociology	34	37	40	45	56	92	156	71	66	55	34	28	18	NA	NA
Other social sciences	149	150	183	160	202	223	247	288	230	226	255	243	284	NA	NA
Other sciences	242	261	307	271	350	362	358	409	622	593	495	408	447	437	480

Appendix table 2-48.
Federal obligations for applied research, by agency and field of science and engineering: FYs 1985–99

Field	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Preliminary 1998	Preliminary 1999
Millions of current dollars															
Engineering	2,733	2,770	2,917	2,950	3,258	3,125	3,711	3,727	4,292	4,189	4,260	4,069	4,107	4,394	4,310
Aeronautical	547	549	573	571	659	658	760	630	947	947	977	988	1,084	NA	NA
Astronautical	383	474	576	527	619	519	583	536	440	439	480	455	526	NA	NA
Chemical	180	173	138	169	92	166	203	193	173	167	179	155	167	NA	NA
Civil	173	158	159	169	178	270	246	277	213	240	269	247	230	NA	NA
Electrical	482	518	611	577	669	493	587	594	678	536	552	468	449	NA	NA
Mechanical	179	153	146	157	157	177	220	223	324	237	248	181	150	NA	NA
Metallurgy & materials	227	217	152	227	266	294	416	454	454	521	447	487	398	NA	NA
Other engineering	563	529	562	553	619	548	695	822	1,062	1,102	1,107	1,088	1,103	NA	NA
Millions of constant 1992 dollars[a]															
Total, all fields	10,610	10,359	10,851	10,693	11,363	11,097	12,144	12,001	13,144	13,211	13,523	12,569	12,898	13,793	14,025
Life sciences	3,287	3,233	3,593	3,756	4,002	3,921	4,311	4,069	4,368	4,578	4,840	4,724	4,880	5,243	5,290
Biological & agricultural, total	1,582	1,635	1,794	2,002	2,143	2,103	2,288	2,116	2,213	2,237	2,384	2,467	2,324	NA	NA
Biological (excl. environmental)	994	1,045	1,255	1,477	1,494	1,506	1,636	1,453	1,527	1,528	1,558	1,752	1,725	NA	NA
Environmental biology	172	171	180	179	235	187	281	309	325	369	545	454	337	NA	NA
Agricultural	416	419	361	346	415	411	371	353	361	339	281	261	262	NA	NA
Medical sciences, total	1,561	1,444	1,597	1,594	1,693	1,645	1,650	1,779	1,971	2,142	2,189	2,034	2,233	NA	NA
Other life sciences	144	153	203	160	165	172	374	174	183	199	267	223	323	NA	NA
Psychology	248	249	268	247	263	251	264	176	296	287	320	213	225	242	244
Physical sciences	1,571	1,433	1,395	1,303	1,341	1,232	1,394	1,488	1,481	1,357	1,313	966	1,048	1,068	1,110
Astronomy	18	19	22	14	19	18	20	9	22	22	31	18	18	NA	NA
Chemistry	287	284	283	270	311	279	298	340	292	318	282	301	293	NA	NA
Physics	1,092	996	942	897	889	838	840	971	1,011	895	877	406	452	NA	NA
Other physical sciences	172	134	147	120	121	96	236	168	156	122	123	241	285	NA	NA
Environmental sciences	898	909	881	855	845	965	912	904	1,047	1,257	1,288	1,335	1,343	1,455	1,383
Atmospheric science	353	349	373	358	304	354	364	332	340	377	416	378	434	NA	NA
Geological	228	221	212	203	233	238	236	209	236	333	368	359	271	NA	NA
Oceanography	228	254	215	223	221	237	207	249	254	292	204	242	263	NA	NA
Other environmental sciences	88	84	82	72	87	137	105	114	218	255	301	357	375	NA	NA

Appendix table 2-48.
Federal obligations for applied research, by agency and field of science and engineering: FYs 1985–99

Field	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Preliminary 1998	Preliminary 1999
								Millions of constant 1992 dollars[a]							
Mathematics & computer sciences	402	400	403	385	436	466	492	679	696	742	907	849	904	1,000	1,281
Mathematics	68	52	55	61	76	70	65	91	67	90	88	84	57	NA	NA
Computer sciences	209	212	204	195	229	362	372	524	528	540	647	677	783	NA	NA
Other mathematics & computer sciences	124	135	143	128	130	34	54	64	101	112	172	88	64	NA	NA
Social sciences	407	375	423	395	443	520	583	550	468	441	438	403	425	517	538
Anthropology	3	2	4	2	2	2	3	3	4	6	6	5	6	NA	NA
Economics	159	130	145	146	144	172	155	172	155	147	150	141	141	NA	NA
Political science	11	10	7	8	9	7	10	16	22	20	14	10	9	NA	NA
Sociology	43	46	48	52	63	99	160	71	64	52	31	25	16	NA	NA
Other social sciences	190	186	221	186	226	240	254	288	224	215	237	221	254	NA	NA
Other sciences	309	324	370	316	391	388	368	409	606	564	460	372	400	386	419
Engineering	3,487	3,437	3,517	3,438	3,643	3,355	3,820	3,727	4,182	3,985	3,957	3,707	3,673	3,882	3,760
Aeronautical	698	681	691	665	737	706	782	630	922	901	908	900	969	NA	NA
Astronautical	489	588	695	614	692	557	601	536	429	418	446	414	471	NA	NA
Chemical	230	215	166	197	103	178	209	193	168	159	167	142	149	NA	NA
Civil	221	196	192	197	199	290	253	277	208	228	250	225	206	NA	NA
Electrical	615	643	737	672	748	529	605	594	661	510	512	427	402	NA	NA
Mechanical	228	190	176	183	176	190	226	223	316	225	230	165	134	NA	NA
Metallurgy & materials	290	269	183	265	297	316	428	454	443	496	415	444	356	NA	NA
Other engineering	718	656	678	644	692	589	716	822	1,034	1,048	1,028	991	986	NA	NA

NA = not available

[a] See Appendix table 2-1 for GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Develoment, Detailed Historical Tables: Fiscal Years 1951-98*, NSF 98–328 (Arlington, VA: 1998); and NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999; Detailed Statistical Tables,* NSF 99–333 (Arlington, VA: NSF, forthcoming).

See figure 2-20 in Volume I.

Appendix table 2-49.
R&D associated primarily with chemistry (nonmedical) and chemical engineering: 1985–97

Year	Total	Federal obligations for research in chemistry and chemical engineering	Academic R&D (not federally funded) in chemistry and chemical engineering	Company–funded R&D in industrial chemicals and other chemicals (but not drugs and medicines)
		Millions of current dollars		
1985	5,909	905	175	4,829
1986	6,115	905	204	5,007
1987	6,490	912	228	5,350
1988	7,138	951	258	5,928
1989	7,669	944	294	6,431
1990	8,615	1,036	328	7,251
1991	8,993	1,148	353	7,492
1992	8,687	1,167	363	7,157
1993	8,987	1,095	366	7,526
1994	8,415	1,112	369	6,934
1995	8,619	1,106	378	7,135
1996	9,239	1,092	396	7,751
1997	NA	NA	NA	7,042
		Millions of constant 1992 dollars		
1985	7,525	1,152	223	6,149
1986	7,589	1,123	253	6,214
1987	7,813	1,098	274	6,441
1988	8,291	1,105	300	6,886
1989	8,548	1,053	328	7,168
1990	9,204	1,107	351	7,747
1991	9,240	1,180	362	7,698
1992	8,687	1,167	363	7,157
1993	8,756	1,067	357	7,332
1994	8,007	1,058	351	6,598
1995	8,017	1,029	351	6,637
1996	8,435	997	361	7,077
1997	NA	NA	NA	6,312

NA = not available

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *1997 U.S. Industrial R&D Performers,* NSF 99–355, by Raymond M. Wolfe (Arlington, VA: 1998); NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998 and 1999,* NSF–333, Project Officer, Ronald Meeks (Arlington,VA: 1999); and NSF/SRS, *Academic Research and Development Expenditures: Fiscal Year 1997,* NSF 99–336, Project Officer, M. Marge Machen (Arlington, VA: 1999).

See figure 2-21 in Volume I.

Appendix table 2-50.
R&D associated primarily with the life sciences

Year	Total	Federal obligations for research in the life sciences	Development expenditures by Dept. of Health and Human Services and Dept. of Veterans Affairs	Development expenditures by USDA	Academic R&D (not federally funded) in the life sciences and bioengineering/ biomedical engineering	Company–funded R&D in food, kindred and tobacco products	Company–funded R&D in drugs and medicines
Millions of current collars							
1985	13,733	6,389	451	32	2,244	1,136	3,481
1986	14,711	6,684	514	31	2,544	1,280	3,657
1987	16,200	7,438	623	30	2,811	1,204	4,095
1988	17,845	7,917	719	32	3,104	1,173	4,900
1989	19,700	8,578	867	39	3,460	1,244	5,512
1990	21,216	9,028	1,125	51	3,848	1,248	5,917
1991	23,629	9,694	1,479	62	4,170	1,277	6,947
1992	24,985	10,126	1,095	69	4,375	1,386	7,934
1993	27,274	10,900	1,216	76	4,604	1,345	9,132
1994	28,845	11,416	1,332	78	4,918	1,476	9,625
1995	30,346	11,874	1,406	81	5,217	1,566	10,202
1996	30,644	12,214	1,466	85	5,547	1,564	9,769
1997	NA	NA	NA	NA	NA	1,787	11,586
Millions of constant 1992 dollars							
1985	17,487	8,135	575	41	2,857	1,447	4,433
1986	18,257	8,295	638	39	3,158	1,588	4,538
1987	19,504	8,955	750	36	3,385	1,450	4,930
1988	20,729	9,197	835	37	3,605	1,363	5,692
1989	21,957	9,561	966	43	3,856	1,387	6,144
1990	22,667	9,645	1,201	54	4,111	1,333	6,322
1991	24,279	9,961	1,519	64	4,284	1,312	7,138
1992	24,985	10,126	1,095	69	4,375	1,386	7,934
1993	26,573	10,620	1,185	74	4,486	1,310	8,897
1994	27,448	10,863	1,267	75	4,680	1,405	9,159
1995	28,227	11,045	1,308	75	4,853	1,457	9,489
1996	27,978	11,151	1,339	77	5,064	1,428	8,919
1997	NA	NA	NA	NA	NA	1,602	10,385

NA = not available

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *1997 U.S. Industrial R&D Performers,* NSF 99–355, by Raymond M. Wolfe (Arlington, VA: 1998); NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998 and 1999,* NSF–333, Project Officer, Ronald Meeks (Arlington,VA: 1999); and NSF/SRS, *Academic Research and Development Expenditures: Fiscal Year 1997,* NSF 99–336, Project Officer, M. Marge Machen (Arlington, VA: 1999).

See figure 2-22 in Volume I.

Appendix table 2-51.
R&D associated primarily with mathematics, computer sciences, and communication and electrical equipment (excluding DOD-supported development of military equipment): 1985–97

Year	Total	Academic R&D in mathematics (not federally funded)	Federal obligations for research in mathematics and in computer science	Academic research in computer science (not federally funded)	Federal obligations for research in electrical engineering	Academic R&D in electrical engineering (not federally funded)	Company-funded R&D in office, computing and accounting machines	Company-funded R&D in electrical equipment
				Millions of current collars				
1985	19,155	34	585	87	639	122	8,418	9,271
1986	19,760	41	621	102	702	147	8,380	9,767
1987	20,389	47	641	117	773	169	8,193	10,449
1988	21,128	53	666	134	759	194	9,347	9,975
1989	22,293	59	762	161	792	220	10,725	9,575
1990	22,249	60	857	178	662	237	10,988	9,267
1991	21,479	62	968	179	737	249	10,419	8,865
1992	22,590	67	1,177	180	790	247	10,614	9,516
1993	19,194	73	1,244	185	847	246	4,917	11,682
1994	20,264	76	1,371	194	745	262	4,078	13,537
1995	24,625	78	1,577	197	735	279	4,699	17,060
1996	31,325	84	1,597	198	658	300	8,132	20,356
1997	NA	NA	NA	NA	NA	NA	12,787	22,747
				Millions of constant 1992 dollars				
1985	24,392	43	745	111	813	155	10,719	11,806
1986	24,522	51	771	126	871	182	10,400	12,121
1987	24,547	57	772	141	930	203	9,864	12,580
1988	24,542	62	774	156	882	225	10,857	11,587
1989	24,848	66	849	179	883	245	11,954	10,672
1990	23,770	64	915	190	708	253	11,739	9,901
1991	22,070	64	995	184	757	256	10,706	9,109
1992	22,590	67	1,177	180	790	247	10,614	9,516
1993	18,700	71	1,212	180	825	240	4,791	11,382
1994	19,282	72	1,305	184	709	250	3,880	12,881
1995	22,905	72	1,467	183	683	260	4,371	15,868
1996	28,599	77	1,458	181	601	274	7,424	18,585
1997	NA	NA	NA	NA	NA	NA	11,461	20,388

NA = not available

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *1997 U.S. Industrial R&D Performers,* NSF 99–355, by Raymond M. Wolfe (Arlington, VA: 1998); NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998 and 1999,* NSF–333, Project Officer, Ronald Meeks (Arlington,VA: 1999); and NSF/SRS, *Academic Research and Development Expenditures: Fiscal Year 1997,* NSF 99–336, Project Officer, M. Marge Machen (Arlington, VA: 1999).

See figures 2-23 and 2-29 in Volume I.

Appendix table 2-52.
Manufacturing and nonmanufacturing R&D expenditures: 1970–97

Year	All industries			All manufacturing industries			All nonmanufacturing industries		
	Total	Company support	Federal support	Total	Company support	Federal support	Total	Company support	Federal support
	Millions of current dollars								
1970	18,067	10,288	7,779	17,362	10,063	7,299	705	225	480
1971	18,320	10,654	7,666	17,616	10,402	7,214	704	252	452
1972	19,552	11,535	8,017	18,845	11,258	7,587	707	277	430
1973	21,249	13,104	8,145	20,534	12,805	7,729	715	299	416
1974	22,887	14,667	8,220	22,119	14,362	7,757	768	305	463
1975	24,187	15,582	8,605	23,452	15,157	8,295	735	425	310
1976	26,997	17,436	9,561	26,152	16,965	9,187	845	471	374
1977	29,825	19,340	10,485	28,867	18,799	10,068	958	541	417
1978	33,304	22,115	11,189	32,075	21,413	10,662	1,229	702	527
1979	38,226	25,708	12,518	36,686	24,849	11,837	1,540	859	681
1980	44,505	30,476	14,029	42,690	29,439	13,251	1,815	1,037	778
1981	51,810	35,428	16,382	49,904	34,380	15,524	1,906	1,048	858
1982	58,650	40,105	18,545	56,178	38,633	17,545	2,472	1,472	1,000
1983	65,268	44,588	20,680	61,931	42,504	19,427	3,337	2,084	1,253
1984	74,800	51,404	23,396	69,895	48,152	21,743	4,905	3,252	1,653
1985	84,239	57,403	27,196	77,525	52,642	24,883	6,714	4,401	2,313
1986	87,823	59,932	27,891	80,377	55,192	25,185	7,446	4,740	2,706
1987	92,155	61,403	30,752	84,311	56,259	28,052	7,844	5,144	2,700
1988	97,015	66,672	30,343	86,503	59,415	27,088	10,513	7,257	3,256
1989	102,055	73,501	28,554	88,024	63,199	24,826	14,031	10,302	3,729
1990	109,727	81,602	28,125	88,934	65,251	23,683	20,793	16,351	4,442
1991	116,952	90,580	26,372	88,506	67,639	20,867	28,446	22,941	5,505
1992	119,110	94,388	24,722	90,177	71,025	19,152	28,933	23,363	5,570
1993	117,400	94,591	22,809	86,569	69,901	16,669	30,831	24,690	6,140
1994	119,595	97,131	22,463	90,749	73,375	17,373	28,846	23,756	5,090
1995	132,103	108,652	23,451	100,067	81,236	18,831	32,036	27,415	4,620
1996	144,667	121,015	23,653	111,864	91,845	20,020	32,803	29,170	3,633
1997	157,539	133,611	23,928	121,025	101,202	19,826	36,514	32,409	4,105

Appendix table 2-52.
Manufacturing and nonmanufacturing R&D expenditures: 1970–97

Year	All industries			All manufacturing industries			All nonmanufacturing industries		
	Total	Company support	Federal support	Total	Company support	Federal support	Total	Company support	Federal support
	Millions of constant 1992 dollars[a]								
1970	59,275	33,753	25,522	56,962	33,015	23,947	2,313	738	1,575
1971	57,143	33,231	23,911	54,947	32,445	22,502	2,196	786	1,410
1972	58,504	34,515	23,989	56,388	33,686	22,702	2,115	829	1,287
1973	60,195	37,122	23,074	58,170	36,275	21,895	2,025	847	1,178
1974	59,493	38,126	21,367	57,497	37,333	20,164	1,996	793	1,204
1975	57,465	37,021	20,444	55,719	36,011	19,708	1,746	1,010	737
1976	60,599	39,138	21,461	58,703	38,081	20,622	1,897	1,057	840
1977	62,882	40,776	22,106	60,862	39,635	21,227	2,020	1,141	879
1978	65,443	43,456	21,987	63,028	42,077	20,951	2,415	1,379	1,036
1979	69,212	46,547	22,665	66,424	44,992	21,432	2,788	1,555	1,233
1980	73,769	50,515	23,254	70,761	48,797	21,964	3,008	1,719	1,290
1981	78,488	53,671	24,817	75,601	52,083	23,518	2,887	1,588	1,300
1982	83,583	57,154	26,429	80,060	55,056	25,004	3,523	2,098	1,425
1983	89,213	60,946	28,267	84,651	58,097	26,554	4,561	2,849	1,713
1984	98,525	67,708	30,817	92,064	63,425	28,639	6,461	4,283	2,177
1985	107,270	73,097	34,631	98,720	67,034	31,686	8,550	5,604	2,945
1986	108,989	74,376	34,613	99,748	68,493	31,255	9,241	5,882	3,358
1987	110,950	73,926	37,024	101,506	67,733	33,773	9,444	6,193	3,251
1988	112,690	77,445	35,246	100,480	69,015	31,465	12,212	8,430	3,782
1989	113,748	81,923	31,826	98,110	70,440	27,671	15,639	11,482	4,156
1990	117,230	87,182	30,048	95,015	69,713	25,302	22,215	17,469	4,746
1991	120,173	93,074	27,098	90,943	69,502	21,442	29,229	23,573	5,657
1992	119,110	94,388	24,722	90,177	71,025	19,152	28,933	23,363	5,570
1993	114,380	92,158	22,222	84,342	68,103	16,240	30,038	24,055	5,982
1994	113,802	92,426	21,375	86,354	69,821	16,532	27,449	22,605	4,843
1995	122,875	101,062	21,813	93,077	75,561	17,516	29,798	25,500	4,297
1996	132,080	110,486	21,595	102,131	83,854	18,278	29,949	26,632	3,317
1997	141,202	119,755	21,447	108,475	90,707	17,770	32,727	29,048	3,679

NOTES: As a result of a new sample design, statistics for 1988–91 have been revised. These statistics now better reflect R&D performance among firms in nonmanufacturing industries and small firms in all industries.

[a]See appendix table 2-1 for GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Research and Development in Industry: 1997* (Arlington, VA: 1998, NSF 99-358).

See figure 2-13 in Volume I.

Appendix table 2-53.
Total expenditures for industrial R&D (financed by company, Federal, and other funds), by industry and size of company: 1985–97
(Millions of current dollars)

	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Industry														
Total		84,239	87,823	92,155	97,015	102,055	109,727	116,952	119,110	117,400	119,595	132,103	144,667	157,539
Manufacturing		77,525	80,377	84,311	86,503	88,024	88,934	88,506	90,177	86,569	90,749	100,067	111,864	121,025
Food, kindred, and tobacco products	20,21	D	D	1,206	D	D	D	1,277	1,386	1,345	1,476	1,566	1,564	1,787
Textiles and apparel	22,23	D	D	D	D	D	D	D	D	D	D	D	D	D
Lumber, wood products, and furniture	24,25	147	144	137	D	192	216	D	D	D	D	D	D	348
Paper and allied products	26	D	D	D	D	879	1,059	D	D	D	D	D	D	D
Chemicals and allied products	28	8,540	8,843	9,635	11,067	12,069	13,291	14,648	15,381	D	D	17,547	D	D
Industrial chemicals	281–82,286	3,498	3,552	3,716	4,172	4,451	5,010	5,390	5,165	D	D	D	D	D
Drugs and medicines	283	D	3,658	D	4,906	D	D	D	7,944	9,146	9,633	10,215	9,773	11,589
Other chemicals	284–85,287–89	D	1,633	D	1,989	D	D	D	2,272	D	D	D	2,505	D
Petroleum refining and extraction	13,29	D	D	1,897	1,997	2,180	2,306	2,498	2,277	2,152	1,950	1,760	1,654	D
Rubber products	30	D	D	D	D	D	D	D	D	D	D	D	D	D
Stone, clay, and glass products	32	D	950	995	D	D	D	D	D	538	591	448	468	608
Primary metals	33	D	D	730	637	686	739	714	522	669	690	593	D	988
Ferrous metals and products	331–32,3398–99	D	D	D	253	D	D	D	D	289	D	D	D	D
Nonferrous metals and products	333–36	416	458	D	384	D	D	D	D	380	D	D	D	D
Fabricated metal products	34	829	895	783	881	904	939	974	1,017	1,158	1,111	1,023	D	1,798
Machinery	35	12,216	D	D	D	D	14,446	14,775	14,938	8,381	8,110	D	13,455	18,499
Office, computing, and accounting machines	357	D	D	D	D	D	D	D	D	4,950	4,106	D	D	12,840
Other machinery, except electrical	351–56,358–59	D	2,396	2,428	2,682	2,729	D	D	D	3,431	4,004	5,041	D	5,659
Electrical equipment	36	14,432	14,980	15,848	14,128	13,318	13,400	13,415	13,360	13,349	15,338	18,751	22,498	24,585
Radio and TV receiving equipment	365	D	133	139	149	96	114	D	D	D	D	D	D	D
Communication equipment	366	9,397	9,669	10,184	8,427	7,071	5,928	4,787	D	D	D	D	D	D
Electronic components	367	3,385	D	4,286	4,133	4,025	3,914	D	3,567	5,311	6,032	D	D	D
Other electrical equipment	361–64,369	D	D	1,239	1,419	2,126	3,444	D	D	D	D	D	D	4,909
Transportation equipment	37	D	31,275	34,246	34,775	33,859	31,361	27,428	27,494	27,258	28,087	32,441	32,737	31,993
Motor vehicles and motor vehicles equipment	371	6,984	D	D	D	D	D	D	D	11,718	D	D	D	D
Other transportation equipment	373–75,379	D	D	D	D	D	D	D	D	483	D	D	D	D
Aircraft and missiles	372,376	22,231	21,050	24,458	24,168	22,331	20,635	16,629	17,158	15,056	14,260	16,951	16,224	16,296
Professional and scientific instruments	38	5,013	5,103	5,222	5,530	5,992	7,055	8,705	9,542	10,119	11,441	11,976	12,149	13,458
Scientific and mechanical measuring instruments	381–82	D	D	D	1,959	2,366	3,346	D	5,156	5,681	6,952	7,146	D	8,135
Optical, surgical, photographic, and other instruments	384–87	D	D	D	3,571	3,626	3,709	D	4,386	4,438	4,489	4,831	D	5,323
Other manufacturing industries	27,31,39	D	382	D	D	D	D	D	D	D	D	D	D	2,798
Nonmanufacturing		6,714	7,446	7,844	10,513	14,031	20,793	28,446	28,933	30,831	28,846	32,036	32,803	36,514

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-53.
Total expenditures for industrial R&D (financed by company, Federal, and other funds), by industry and size of company: 1985–97
(Millions of current dollars)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Size of company													
Fewer than 500 employees	5,866	7,071	7,163	S	7,809	S	13,172	13,557	14,620	13,966	16,662	20,249	24,063
500 to 999	1,648	1,902	1,725	1,669	1,825	2,154	8,000	7,958	3,230	3,608	4,693	4,637	4,966
1,000 to 4,999	4,022	4,251	4,501	5,245	5,756	6,746	8,049	8,258	9,135	8,912	9,532	11,537	14,266
5,000 to 9,999	6,240	7,472	7,262	7,622	7,881	8,411	10,453	11,886	13,334	14,617	16,960	18,273	19,590
10,000 to 24,999	11,109	10,493	12,043	11,506	10,450	12,486	15,770	15,744	15,421	15,972	17,071	20,164	21,510
25,000 or more	55,354	56,991	59,461	63,694	68,335	71,030	61,508	61,707	61,659	62,519	67,185	69,808	73,144

D = data have been withheld to avoid disclosing operations of individual companies; S = imputation of more than 50 percent (for years prior to 1993, data have been withheld);
SIC = Standard Industrial Classification

NOTES: As a result of a new sample design, to better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries, data for 1991 and later years are not directly comparable with data for 1990 and earlier years.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS) , *Research and Development in Industry: 1997* (Arlington, VA: 1999)

See figures 2-8 and 2-41 in Volume I.

Appendix table 2-54.
Company and other (except Federal) funds for industrial R&D performance, by industry and size of company: 1985–97
(Millions of current dollars)

	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Industry														
Total		57,043	59,932	61,403	66,672	73,501	81,602	90,580	94,388	94,591	97,131	108,652	121,015	133,611
Manufacturing		52,642	55,192	56,259	59,415	63,199	65,251	67,639	71,025	69,901	73,375	81,236	91,845	101,202
Food, kindred, and tobacco products	20,21	1,136	1,280	1,204	1,173	1,244	1,248	1,277	1,386	1,345	1,476	1,566	1,564	1,787
Textiles and apparel	22,23	218	246	243	215	S	260	236	261	286	316	381	414	476
Lumber, wood products, and furniture	24,25	147	144	137	165	192	216	200	234	196	201	229	634	348
Paper and allied products	26	576	538	604	752	879	1,059	1,174	1,182	1,191	1,263	1,404	1,534	1,456
Chemicals and allied products	28	8,310	8,664	9,445	10,828	11,943	13,168	14,439	15,091	16,658	16,559	17,337	17,520	18,628
Industrial chemicals	281–82,286	3,281	3,374	3,531	3,939	4,340	4,902	5,225	4,911	5,165	4,780	5,139	5,246	4,970
Drugs and medicines	283	3,481	3,657	4,095	4,900	5,512	5,917	6,947	7,934	9,132	9,625	10,202	9,769	11,586
Other chemicals	284–85,287–89	1,548	1,633	1,819	1,989	2,091	2,349	2,267	2,246	2,361	2,154	1,996	2,505	2,072
Petroleum refining and extraction	13,29	2,194	1,971	1,883	1,975	2,162	2,289	2,487	2,268	2,138	1,939	1,754	1,630	1,612
Rubber products	30	659	655	596	718	867	1,056	D	1,256	1,059	1,432	1,210	1,269	1,372
Stone, clay, and glass products	32	825	941	985	697	615	538	455	479	529	553	441	463	606
Primary metals	33	730	786	711	620	666	717	706	514	646	672	580	637	767
Ferrous metals and products	331–32,3398–99	323	336	249	252	244	231	225	221	272	241	217	214	414
Nonferrous metals and products	333–36	407	450	462	368	422	486	481	293	374	431	363	422	353
Fabricated metal products	34	780	800	633	718	726	736	748	723	936	868	937	1,322	1,669
Machinery	35	10,721	10,701	10,577	11,929	13,342	13,575	13,720	13,903	8,295	8,011	9,676	13,338	18,393
Office, computing, and accounting machines	357	8,418	8,380	8,193	9,347	10,725	10,988	10,419	10,614	4,917	4,078	4,699	8,132	12,787
Other machinery, except electrical	351–56,358–59	2,303	2,321	2,384	2,582	2,618	2,587	3,301	3,289	3,378	3,933	4,976	5,206	5,606
Electrical equipment	36	9,271	9,767	10,449	9,975	9,575	9,267	8,865	9,516	11,682	13,537	17,060	20,356	22,747
Radio and TV receiving equipment	365	350	133	139	149	96	114	D	93	87	64	114	140	152
Communication equipment	366	5,174	5,117	5,455	4,798	4,159	3,584	S	3,381	3,954	4,939	3,845	4,359	7,377
Electronic components	367	2,826	3,357	3,630	3,684	3,655	3,496	3,177	3,320	5,105	5,870	9,628	12,497	10,786
Other electrical equipment	361–64,369	921	1,160	1,225	1,345	1,664	2,073	D	2,722	2,537	2,664	3,473	3,360	4,432
Transportation equipment	37	12,092	13,567	13,462	13,910	14,596	14,264	14,858	16,292	16,640	17,695	19,311	20,535	19,742
Motor vehicles and motor vehicles equipment	371	6,164	7,171	7,167	7,783	8,756	8,594	9,063	9,132	10,659	11,950	13,590	14,528	13,758
Other transportation equipment	373–75,379	279	330	356	361	337	283	262	289	297	279	232	298	307
Aircraft and missiles	372,376	5,649	6,066	5,939	5,766	5,503	5,387	5,533	6,871	5,684	5,466	5,489	5,710	5,677
Professional and scientific instruments	38	4,622	4,752	4,950	5,339	5,729	6,318	6,840	7,321	7,542	8,058	8,516	8,207	8,958
Scientific and mechanical measuring instruments	381–82	1,596	1,521	1,598	1,863	2,205	2,696	3,017	3,013	3,196	3,687	3,787	3,283	3,719
Optical, surgical, photographic, and other instruments	384–87	3,026	3,231	3,352	3,476	3,524	3,621	3,823	4,308	4,346	4,371	4,729	4,924	5,240
Other manufacturing industries	27,31,39	361	380	380	401	438	541	D	599	758	796	835	2,423	2,642
Nonmanufacturing		4,401	4,740	5,144	7,257	10,302	16,351	22,941	23,363	24,690	23,756	27,415	29,170	32,409

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-54.
Company and other (except Federal) funds for industrial R&D performance, by industry and size of company: 1985–97
(Millions of current dollars)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Size of company													
Fewer than 500 employees	5,127	6,203	6,200	S	S	S	11,285	11,532	13,006	12,802	14,684	17,948	21,854
500 to 999	1,531	1,765	1,610	1,748	1,934	2,144	7,819	7,807	3,048	3,426	4,468	4,418	4,590
1,000 to 4,999	5,249	6,243	6,281	6,820	7,546	8,363	9,403	10,865	12,219	13,533	16,162	17,761	19,049
5,000 to 9,999	3,350	3,455	3,753	4,075	4,509	4,997	7,233	7,495	8,371	8,087	9,289	11,068	13,655
10,000 to 24,999	8,366	8,489	9,681	10,512	11,631	12,890	12,397	12,328	12,606	13,625	15,125	19,133	20,597
25,000 or more	33,420	33,777	33,878	36,785	40,703	45,106	42,443	44,361	45,340	45,658	48,924	50,686	53,866

D = data have been withheld to avoid disclosing operations of individual companies; S = imputation of more than 50 percent (for years prior to 1993, data have been withheld); SIC = Standard Industrial Classification

NOTES: Company funds include funds for industrial R&D work performed within company facilities from all sources except the Federal Government. The funds may be the companies' own or from outside organizations such as research institutions, universities and colleges, nonprofit organizations, other companies, and state governments. Company–financed R&D not performed within the company is excluded.

As a result of a new sample design, to better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries, data for 1991 and later years are not directly comparable with data for 1990 and earlier years.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Research and Development in Industry: 1997* (Arlington, VA: 1999).

See figure 2-8 in Volume I.

Appendix table 2-55.
Federal funds for industrial R&D performance, by industry and size of company: 1985–97
(Millions of current dollars)

	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Industry														
Total		27,196	27,891	30,752	30,343	28,554	28,125	26,372	24,722	22,809	22,463	23,451	23,653	23,928
Manufacturing		24,883	25,185	28,052	27,088	24,826	23,683	20,867	19,152	16,669	17,373	18,831	20,020	19,823
Food, kindred, and tobacco products	20,21	D	D	2	D	D	D	0	0	0	0	0	0	0
Textiles and apparel	22,23	D	D	D	D	D	D	S	D	D	D	D	D	D
Lumber, wood products, and furniture	24,25	0	0	0	D	0	0	D	D	D	D	D	D	0
Paper and allied products	26	D	D	D	D	0	0	D	D	D	D	D	D	D
Chemicals and allied products	28	230	179	190	238	126	123	209	S	D	D	210 S	D	D
Industrial chemicals	281–82,286	217	178	185	232	111	109	165	S	D	D	D	D	D
Drugs and medicines	283	D	1	D	6	D	D	D	S	15	8	14	3	3 S
Other chemicals	284–85,287–89	D	0	D	0	D	D	D	S	D	D	D	0	D
Petroleum refining and extraction	13,29	D	D	14	22	S	S	11	9	14	10	6	24	D
Rubber products	30	D	D	D	D	D	D	D	D	D	D	D	D	D
Stone, clay, and glass products	32	D	9	10	D	D	D	D	D	9	38	6	5	2
Primary metals	33	D	D	19	17	22	D	8	S	23	17	13	D	221
Ferrous metals and products	331–32,3398–99	D	D	D	1	D	D	1	D	17	D	D	D	D
Nonferrous metals and products	333–36	9	8	D	16	D	D	7	D	6	D	D	D	D
Fabricated metal products	34	49	95	150	163	178	203	226	294	222	243	86	D	129
Machinery	35	1,495	D	D	D	D	871	1,055	1,035	86	99	D	117	106
Office, computing, and accounting machines	357	D	D	D	D	D	D	D	D	33	28	D	D	53
Other machinery, except electrical	351–56,358–59	D	75	44	101	112	D	D	D	53	71	64	D	53
Electrical equipment	36	5,161	5,213	5,399	4,153	3,743	4,133	4,550	3,844	1,667	1,801	1,690	2,143	1,839
Radio and TV receiving equipment	365	D	0	0	0	0	0	0	D	D	D	D	D	D
Communication equipment	366	4,223	4,552	4,729	3,630	2,911	2,344	D	D	D	D	D	D	D
Electronic components	367	559	D	656	449	369	418	D	247	206	162	D	D	D
Other electrical equipment	361–64,369	D	D	14	74	463	1,371	D	D	D	D	D	D	477
Transportation equipment	36	D	17,708	20,784	20,865	19,262	17,097	12,570	11,202	10,617	10,392	13,130	12,202	12,251
Motor vehicles and motor vehicles equipment	371	820	D	D	D	D	D	D	D	D	D	D	D	D
Other transportation equipment	373–75,379	D	D	D	D	D	D	D	D	D	D	D	D	D
Aircraft and missiles	372–376	16,582	14,984	18,519	18,402	16,828	15,248	11,096	S	9,372	8,794	11,462	10,515	10,619
Professional and scientific instruments	38	391	351	272	191	263	737	1,865	2,221	2,577	3,384	3,460 S	3,942	4,499
Scientific and mechanical measuring instruments	381–82	D	D	D	S	S	S	D	2,143	2,484	3,266	3,358 S	D	4,416
Optical, surgical, photographic, and other instruments	384–87	D	D	D	95	101	87	D	78	92	118	102	D	84
Other manufacturing industries	27,31,39	D	2	D	D	D	D	D	61	D	D	D	D	156
Nonmanufacturing industries		2,313	2,706	2,700	3,256	3,729	4,442	5,505	5,570	6,140	5,090	4,620	3,633	4,150

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-55.
Federal funds for industrial R&D performance, by industry and size of company: 1985–97
(Millions of current dollars)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Size of company													
Fewer than 500 employees	739	868	963	816	901	895	1,887	2,025	1,614	1,164	1,978	2,301	2,209
500 to 999	117	137	115	131	117	S	181	151	182	182	225	219	376
1,000 to 4,999	991	1,229	981	1,093	958	881	1,050	S	1,115	1,083	798	512	540
5,000 to 9,999	672	796	748	864	740	257	816	763	764	825	243	468	612
10,000 to 24,999	2,743	2,004	2,362	1,705	1,129	1,526	3,373	3,416	2,816	2,348	1,946 S	1,031 S	913
25,000 or more	21,934	23,213	25,583	25,734	24,709	24,436	19,065	17,346	16,319	16,862	18,261	19,122	19,277

D = data have been withheld to avoid disclosing operations of individual companies; S = imputation of more than 50 percent (for years prior to 1993, data have been withheld); SIC = Standard Industrial Classification

NOTE: As a result of a new sample to better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries, data for 1991 and later years are not directly comparable to data for 1990 and earlier years.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Research and Development in Industry: 1997* (Arlington, VA: 1999).

See figure 2-8 in Volume I.

Appendix table 2-56.
Concentration of total, Federal, company, and other R&D funds and net sales of R&D-performing companies, by size of R&D program: 1985–97

Companies ranked by size of R&D program	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Percent of total (company, Federal, and other) R&D funds													
First 4 (1–4)	18	19	19	18	19	18	16	15	17	15	16	15	14
Next 4 (5–8)	12	11	12	12	13	13	8	8	7	8	8	8	8
Next 12 (9–20)	17	14	16	17	16	15	12	13	13	14	13	13	13
Next 20 (21–40)	13	13	12	12	12	12	11	11	12	13	12	12	11
Next 60 (41–100)	16	15	14	15	15	16	15	15	16	15	14	14	14
Next 100 (101–200)	9	10	8	8	8	9	12	12	8	9	8	9	9
Next 200 (201–400)	5	8	6	7	6	7	6	6	7	7	7	7	8
Percent of Federal R&D funds													
First 4 (1–4)	29	30	31	31	36	38	14	11	23	26	35	37	40
Next 4 (5–8)	15	16	18	18	15	16	21	18	17	19	19	20	23
Next 12 (9–20)	27	28	27	27	30	26	21	27	32	32	27	23	18
Next 20 (21–40)	16	15	15	15	11	12	15	13	16	13	8	7	7
Next 60 (41–100)	7	7	7	6	6	6	13	11	5	7	5	5	5
Next 100 (101–200)	2	2	1	3	1	1	3	4	5	2	3	4	3
Next 200 (201–400)	0	1	0	0	0	0	2	2	2	1	3	4	4
Percent of company and other (except Federal) R&D funds													
First 4 (1–4)	23	20	20	21	22	21	17	17	17	16	16	15	13
Next 4 (5–8)	7	7	7	7	7	7	7	8	7	7	7	7	7
Next 12 (9–20)	12	12	12	12	13	12	10	12	12	12	11	11	11
Next 20 (21–40)	12	10	11	12	12	13	10	11	11	11	11	10	11
Next 60 (41–100)	18	16	16	16	16	17	16	17	14	14	14	14	13
Next 100 (101–200)	10	10	10	10	10	10	15	14	9	9	9	10	10
Next 200 (201–400)	7	8	8	8	8	8	7	7	8	8	8	8	9
Percent of net sales ranked by size of total R&D funds													
First 4 (1–4)	8	8	7	7	6	8	7	8	8	8	8	6	6
Next 4 (5–8)	4	5	5	5	5	4	3	3	3	2	2	3	2
Next 12 (9–20)	5	5	5	5	5	5	4	4	4	5	6	6	5
Next 20 (21–40)	8	7	7	6	5	5	4	4	4	5	4	4	5
Next 60 (41–100)	12	10	11	11	12	12	12	12	11	10	9	8	7
Next 100 (101–200)	13	10	8	9	8	9	9	9	8	8	8	11	8
Next 200 (201–400)	15	9	12	10	11	12	11	11	10	10	10	11	13

NOTES: Companies were ranked individually for each year; therefore, particular companies comprising the size groups may have changed from year to year.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Research and Development in Industry: 1997* (Arlington, VA: 1999).

Appendix table 2-57.
Company and other (except Federal) R&D funds as a percentage of net sales by industry and size of company: 1985–97
(Percentages)

Industry	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Total		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.7	2.8	3.0	2.9
Manufacturing		3.0	3.2	3.1	3.1	3.1	3.1	3.2	3.3	3.1	2.9	2.9	3.3	3.3
Food, kindred, and tobacco products	20,21	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5
Textiles and apparel	22,23	0.5	0.5	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.9	0.8	0.9
Lumber, wood products, and furniture	24,25	0.8	0.6	0.6	0.6	0.6	0.6	0.9	0.9	0.7	0.6	0.7	1.4	0.9
Paper and allied products	26	0.8	0.7	0.6	0.8	0.8	1.0	1.1	1.0	1.1	1.0	1.0	1.2	1.1
Chemicals and allied products	28	4.9	5.1	5.2	5.2	5.4	5.3	5.3	5.4	6.0	5.1	4.7	5.3	5.3
Industrial chemicals	281–82,286	4.2	4.4	4.4	4.2	4.1	4.4	4.4	4.4	4.4	3.3	3.9	3.7	3.5
Drugs and medicines	283	8.0	8.4	8.7	8.8	8.9	8.8	8.9	9.6	12.5	10.2	10.4	10.1	10.5
Other chemicals	284–85,287–89	3.1	3.3	3.3	3.4	3.9	3.4	3.0	2.7	2.7	2.5	1.4	2.7	2.1
Petroleum refining and extraction	13,29	0.9	1.1	1.0	1.0	0.9	0.9	1.0	0.9	0.9	0.8	0.7	0.7	0.6
Rubber products	30	1.8	1.7	1.6	1.7	1.9	2.1	2.3	2.3	2.1	2.3	1.6	1.8	1.4
Stone, clay, and glass products	32	2.3	2.4	2.5	2.0	1.8	1.7	1.6	1.6	1.5	1.5	1.5	1.2	1.8
Primary metals	33	0.9	1.0	0.9	0.7	0.7	0.8	0.8	0.6	0.7	0.6	0.5	0.6	0.6
Ferrous metals and products	331–32,3398–99	0.5	0.7	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.6
Nonferrous metals and products	333–36	1.4	1.5	1.3	1.0	1.0	1.2	1.2	0.7	1.2	0.9	0.7	1.0	0.6
Fabricated metal products	34	1.4	1.4	1.2	1.1	1.2	1.1	1.2	1.1	1.1	1.0	1.1	1.4	1.5
Machinery	35	6.7	7.3	7.1	6.8	7.3	7.2	7.5	7.3	4.5	3.8	3.6	5.1	5.6
Office, computing, and accounting machines	357	12.4	12.4	12.3	11.2	13.1	14.4	14.9	13.7	9.8	7.9	8.1	9.9	9.2
Other machinery, except electrical	351–56,358–59	2.6	2.9	3.0	2.8	2.6	2.3	2.9	2.9	2.5	2.5	2.4	2.9	3.0
Electrical equipment	36	4.8	5.1	5.4	5.3	5.2	4.5	4.3	4.0	5.4	5.2	5.4	6.1	5.7
Radio and TV receiving equipment	365	4.3	3.6	3.2	2.4	1.8	1.6	1.0	0.6	4.0	1.0	1.6	2.0	2.6
Communication equipment	366	5.4	5.2	5.5	6.1	6.8	6.1	S	7.0	10.1	10.3	8.0	8.5	8.0
Electronic components	367	8.2	9.2	8.5	8.0	7.7	7.4	7.2	7.0	7.8	7.3	8.0	8.5	8.1
Other electrical equipment	361–64,369	2.0	2.2	2.6	2.3	2.3	2.2	2.2	2.1	2.3	2.1	2.5	2.6	2.7
Transportation equipment	37	3.4	3.6	3.4	3.5	3.5	3.4	4.0	4.2	3.9	3.7	3.6	4.1	3.8
Motor vehicles and motor vehicles equipment	371	3.1	3.3	3.4	3.4	3.7	3.7	4.1	4.0	3.7	3.4	3.6	4.2	3.8
Other transportation equipment	373–75,379	2.3	2.7	2.5	2.6	2.5	2.1	2.1	2.1	1.9	1.2	0.9	1.2	2.2
Aircraft and missiles	372,376	3.9	4.0	3.6	3.9	3.3	3.1	4.0	4.7	4.7	5.3	4.2	4.5	3.9
Professional and scientific instruments	38	8.3	8.2	7.5	7.1	6.8	7.1	7.1	7.2	7.2	6.5	7.3	7.7	7.7
Scientific and mechanical measuring instruments	381–82	8.4	8.4	8.1	7.6	6.9	6.9	6.3	6.2	6.4	5.8	6.6	6.7	6.5
Optical, surgical, photographic, and other instruments	384–87	8.1	8.0	7.2	7.1	7.1	7.5	8.0	8.2	7.9	7.2	8.0	8.6	8.9
Other manufacturing industries	27,31,39	1.0	1.2	1.1	1.0	0.9	0.9	0.8	1.3	1.3	1.1	1.2	2.5	2.0
Nonmanufacturing industries		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.2	2.4	2.2	2.2

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-57.
Company and other (except Federal) R&D funds as a percentage of net sales by industry and size of company: 1985–97
(Percentages)

Size of company	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Fewer than 500 employees	3.4	4.0	3.8	3.7	3.5	3.3	3.2	3.2	3.6	2.5	3.9	5.3	5.7
500 to 999	2.2	2.2	2.2	1.7	1.7	1.7	2.4	2.7	2.7	2.5	3.0	3.0	2.8
1,000 to 4,999	2.4	2.4	2.4	2.3	2.1	1.9	2.4	2.7	2.5	2.5	2.6	2.9	2.6
5,000 to 9,999	1.8	2.0	2.0	2.0	2.1	2.8	2.9	2.8	2.8	2.2	2.0	2.6	2.4
10,000 to 24,999	2.5	2.6	2.5	2.6	2.5	2.5	3.0	2.6	2.5	2.5	2.0	2.4	2.5
25,000 or more	3.5	3.7	3.8	3.7	3.7	3.6	3.8	4.0	3.7	3.6	3.1	2.9	2.9

NA = not available; SIC = Standard Industrial Classification

NOTES: As a result of a new sample design, to better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries, data for 1991 and later years are not directly comparable with data for 1990 and earlier years. Beginning with data from the 1995 survey (in which 1994 data were also collected), this table includes both manufacturing and nonmanufacturing companies. Only manufacturing companies were included in prior years. Beginning in 1996 manufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year–to–year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries". Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries". As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Research and Development in Industry: 1997* (Arlington, VA: 1999).

Appendix table 2-58.
The 100 leading industrial R&D companies, ranked by size of R&D expenditures in 1997

Rank	Company	R&D expenditures (millions)	Sales (millions)	Number of Employees	Percent Change in R&D From the Previous Year	Industrial Category
1	General Motors Corp	8,200.0	168,190	608,000	–7.87	Motor vehicles & motor vehicle equipment
2	Ford Motor Co	6,327.0	153,627	363,892	–7.24	Motor vehicles & motor vehicle equipment
3	Intl Business Machines Corp	4,307.0	78,508	269,465	9.48	Electronic computers and computer terminals
4	Lucent Technologies Inc	3,100.6	26,360	134,000	68.69	Modems & other wired telephone equipment
5	Hewlett–Packard Co	3,078.0	42,895	121,900	13.25	Electronic computers and computer terminals
6	Motorola Inc	2,748.0	29,794	150,000	14.79	Radio, TV, cell phone, and satellite communication equip.
7	Intel Corp	2,347.0	25,070	63,700	29.81	Electronic components (semiconductors, coils...)
8	Johnson & Johnson	2,140.0	22,629	90,500	12.34	Drugs: pharmaceutical preparations
9	Pfizer Inc	1,928.0	12,504	49,200	14.49	Drugs: pharmaceutical preparations
10	Microsoft Corp	1,925.0	11,358	22,232	34.43	Prepackaged software
11	Boeing Co	1,924.0	45,800	238,000	60.33	Aircraft, guided missiles & space vehicles
12	Chrysler Corp	1,700.0	58,622	121,000	6.25	Motor vehicles & motor vehicle equipment
13	Merck & Co	1,683.7	23,637	53,800	13.21	Drugs: pharmaceutical preparations
14	American Home Products Corp	1,558.0	14,196	60,523	9.02	Drugs: pharmaceutical preparations
15	General Electric Co	1,480.0	88,540	276,000	4.15	Electrical equipment (industrial & household)
16	Bristol Myers Squibb	1,385.0	16,701	53,600	8.54	Drugs: pharmaceutical preparations
17	Lilly (ELI) & Co	1,382.0	8,518	31,100	16.18	Drugs: pharmaceutical preparations
18	Abbott Laboratories	1,302.4	11,883	54,487	8.10	Drugs: pharmaceutical preparations
19	Proctor & Gamble Co	1,282.0	35,764	106,000	5.00	Other chem. (soaps, ink, paints, fertilizers, explosives...)
20	Pharmacia & Upjohn Inc	1,217.0	6,710	30,000	–3.87	Drugs: pharmaceutical preparations
21	United Technologies Corp	1,187.0	24,713	180,100	5.79	Aircraft, guided missiles & space vehicles
22	Du Pont (E I) De Nemours	1,142.2	39,911	98,000	10.68	Industrial chem.; plastic and other synthetic materials
23	Xerox Corp	1,079.0	18,166	91,400	3.35	Opthalmic goods, photogrph. equip. & clocks
24	Texas Instruments Inc	1,075.0	9,750	44,140	8.70	Electronic components (semiconductors, coils...)
25	Eastman Kodak Co	1,047.7	14,538	97,500	1.92	Opthalmic goods, photogrph. equip. & clocks
26	Digital Equipment	1,014.0	13,047	54,900	–4.54	Computer storage devices
27	Minnesota Mining & MFG Co	1,002.0	15,070	75,639	5.81	Paper & allied products
28	Monsanto Co	939.0	7,514	21,900	28.98	Industrial chem.; plastic and other synthetic materials
29	Schering–Plough	847.0	6,778	22,700	17.18	Drugs: pharmaceutical preparations
30	AT&T Corp	829.0	51,319	127,800	0.85	Communicatons serv. (phone, statellite, radio/TV, cable...)
31	Sun Microsystems Inc	826.0	8,598	21,500	25.70	Electronic computers and computer terminals
32	Compaq Computer Corp	817.0	24,584	32,565	100.74	Electronic computers and computer terminals
33	Lockheed Martin Corp	788.0	28,069	173,000	0.51	Aircraft, guided missiles & space vehicles
34	Dow Chemical	785.0	20,065	42,861	3.15	Industrial chem.; plastic and other synthetic materials

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-58.
The 100 leading industrial R&D companies, ranked by size of R&D expenditures in 1997

Rank	Company	R&D expenditures (millions)	Sales (millions)	Number of Employees	Percent Change in R&D From the Previous Year	Industrial Category
35	Oracle Corp	719.1	7,144	36,802	29.46	Prepackaged software
36	Rockwell Intl Corp	714.0	7,762	45,000	3.33	Electrical equipment (industrial & household)
37	Cisco Systems Inc	698.2	6,440	11,000	74.86	Computer networking communications equip.
38	Warner–Lambert Co	672.2	8,180	40,000	21.16	Drugs: pharmaceutical preparations
39	TRW Inc	650.0	10,831	79,700	16.91	Motor vehicles & motor vehicle equipment
40	Amgen Inc	630.8	2,401	5,308	19.40	Drugs: biological products, except diagnostic substances
41	3COM Corp	581.6	5,420	12,920	73.47	Computer networking communications equip.
42	Applied Materials Inc	567.6	4,074	13,924	17.91	Machinery (indus., farm, services, mining & construction)
43	Philip Morris Cos Inc	533.0	56,114	152,000	3.50	Food & kindred products; tobacco products
44	Exxon Corp	529.0	120,279	80,000	1.73	Oil and gas extraction; petrol. reflining and related ind.
45	Caterpillar Inc	528.0	18,925	59,863	28.78	Machinery (indus., farm, services, mining & construction)
46	ITT Industries Inc	496.9	8,777	58,500	–7.16	Motor vehicles & motor vehicle equipment
47	Schlumberger LTD	486.2	10,648	63,500	7.42	Oil and gas extraction; petrol. reflining and related ind.
48	Apple Computer Inc	485.0	7,081	10,176	–19.70	Electronic computers and computer terminals
49	National Semiconductor Corp	482.0	2,537	13,000	29.54	Electronic components (semiconductors, coils...)
50	Silicon Graphics Inc	479.1	3,663	10,930	35.55	Electronic computers and computer terminals
51	Advanced Micro Devices	467.9	2,356	12,800	16.77	Electronic components (semiconductors, coils...)
52	Seagate Technology	462.2	8,940	111,000	9.94	Computer storage devices
53	NCR Corp	447.0	6,589	38,300	0.68	Electronic computers and computer terminals
54	Honeywell Inc	446.6	8,028	57,500	26.41	Laboratory controlling & measuring instruments
55	Emerson Electric Co	445.1	12,299	100,700	11.64	Laboratory controlling & measuring instruments
56	Raytheon Co–CL B	415.1	13,673	119,200	28.41	Search & navigation equipment
57	Deere & Co	412.3	12,636	34,400	11.34	Machinery (indus., farm, services, mining & construction)
58	Genentech Inc	403.3	948	3,242	–7.09	Drugs: pharmaceutical preparations
59	Baxter International Inc	392.0	6,138	41,000	15.29	Medical instruments
60	Goodyear Tire & Rubber Co	384.1	13,155	95,302	2.56	Rubber and misc. plastic prod. (tires, plastic footwear...)
61	Computer Associates Intl Inc	369.0	4,719	NA	–15.56	Prepackaged software
62	Alliedsignal Inc	349.0	14,472	70,500	1.16	Aircraft, guided missiles & space vehicles
63	Quantum Corp	321.7	5,805	6,219	10.42	Computer storage devices
64	Amp Inc	319.6	5,745	46,526	1.43	Electronic components (semiconductors, coils...)
65	Eaton Corp	319.0	7,563	49,000	19.48	Electrical equipment (industrial & household)
66	Unisys Corp	302.3	6,636	32,600	–11.84	Electronic computers and computer terminals
67	Medtronic Inc	297.2	2,605	13,954	6.06	Medical instruments
68	Automatic Data Processing	296.5	4,112	30,000	18.77	Multiple & miscellaneous computer & data processing services

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-58.
The 100 leading industrial R&D companies, ranked by size of R&D expenditures in 1997

Rank	Company	R&D expenditures (millions)	Sales (millions)	Number of Employees	Percent Change in R&D From the Previous Year	Industrial Category
69	Chiron Corp	296.5	1,056	6,482	10.92	Drugs: in vitro, in vivo diagnostic substances
70	Novell Inc	282.7	1,007	4,770	2.57	Prepackaged software
71	Bay Networks Inc	269.8	2,093	NA	26.35	Computer networking communications equip.
72	Northrop Grumman Corp	256.0	9,153	52,000	0.39	Search & navigation equipment
73	DSC Communications Corp	252.1	1,575	6,681	20.00	Modems & other wired telephone equipment
74	Corning Inc.	250.7	4,129	20,500	31.05	Stone, clay, glass, & concrete products
75	PPG Industries Inc	250.0	7,379	31,900	4.56	Other chem. (soaps, ink, paints, fertilizers, explosives...)
76	Cummins Engine	250.0	5,625	26,300	6.38	Machinery (indus., farm, services, mining & construction)
77	Qualcomm Inc	235.9	2,096	9,000	45.31	Radio, TV, cell phone, and satellite communication eq.
78	Mobil Corp	234.0	58,399	42,700	13.59	Oil and gas extraction; petrol. reflining and related ind.
79	Johnson Controls Inc	232.0	11,145	72,300	40.61	Lumber, wood products, & furniture
80	LSI Logic Corp	229.1	1,290	4,443	24.21	Electronic components (semiconductors, coils...)
81	Textron Inc	222.0	10,544	64,000	20.00	Aircraft, guided missiles & space vehicles
82	EMC Corp/Ma	220.9	2,938	6,400	37.13	Computer storage devices
83	Ingersoll–Rand Co	215.5	7,103	46,567	2.96	Machinery (indus., farm, services, mining & construction)
84	Gillette Co	212.0	10,062	44,000	3.92	Fabricated metal products, except machinery & transp. eq.
85	Kimberly–Clark Corp	211.8	12,547	57,000	1.88	Paper & allied products
86	Storage Technology CP–CL A	209.5	2,145	8,300	18.75	Computer storage devices
87	Micron Technology Inc	208.9	3,516	12,200	8.86	Electronic components (semiconductors, coils...)
88	Guidant Corp	208.3	1,328	6,017	36.59	Medical instruments
89	General Instrument Corp	207.8	1,764	7,350	–0.70	Radio, TV, cell phone, and satellite communication eq.
90	Rohm & Haas Co	201.0	3,999	11,592	7.49	Industrial chem.; plastic and other synthetic materials
91	Shell Oil Co	199.0	28,268	19,904	15.03	Oil and gas extraction; petrol. reflining and related ind.
92	Boston Scientific Corp	196.7	1,872	11,000	–7.35	Medical instruments
93	Analog Devices	196.1	1,243	7,500	10.31	Electronic components (semiconductors, coils...)
94	Case Corp	196.0	6,024	18,300	1.55	Machinery (indus., farm, services, mining & construction)
95	Imation Corp	194.9	2,202	9,800	6.44	Opthalmic goods, photogrph. equip. & clocks
96	Dana Corp	193.0	8,769	47,900	17.68	Motor vehicles & motor vehicle equipment
97	Thermo Electron Corp	191.6	3,558	22,400	24.05	Laboratory controlling & measuring instruments
98	Eastman Chemical Co	191.0	4,678	16,076	3.80	Industrial chem.; plastic and other synthetic materials
99	Cabletron Systems	181.8	1,377	6,887	12.45	Computer networking communications equip.
100	Whirlpool Corp	181.0	8,617	61,370	–8.12	Electrical equipment (industrial & household)

NA = not available

SOURCE: Carl Shepherd and Steven Payson, *U.S. Corporate R&D, Volume II*, a report jointly prepared by the U.S. Department of Commerce/Office of Technology Policy and the National Science Foundation, Division of Science Resources Studies, NSF 00-302 (Arlington, VA: 1999).

Appendix table 2-59.
Discrepancy between Federal R&D support as reported by performers and by federal agencies: 1980–98
(Billions of dollars)

Year	All performers			Industrial performers		
	Performer–reported	Agency–reported	Difference	Performer–reported	Agency–reported	Difference
1980	30.0	29.8	0.2	12.8	13.0	–0.2
1981	33.7	33.1	0.6	15.0	14.9	0.1
1982	37.2	36.4	0.8	17.1	17.2	–0.1
1983	41.6	38.7	2.9	19.1	17.0	2.1
1984	46.6	42.2	4.4	21.7	18.6	3.1
1985	52.7	48.4	4.3	25.3	21.7	3.6
1986	54.7	51.4	3.3	26.0	24.2	1.8
1987	58.5	55.3	3.2	28.8	26.8	2.0
1988	60.2	56.8	3.4	28.2	26.7	1.5
1989	60.5	61.4	–0.9	26.4	28.5	–2.1
1990	61.7	63.6	–1.9	25.8	29.4	–3.6
1991	60.8	61.3	–0.5	24.1	26.4	–2.3
1992	60.9	65.6	–4.7	22.4	29.7	–7.3
1993	60.5	67.3	–6.8	20.8	30.2	–9.4
1994	60.9	67.2	–6.3	20.3	30.5	–10.2
1995	63.2	68.2	–5.0	21.2	30.2	–9.0
1996	63.5	67.7	–4.2	21.4	30.4	–9.0
1997	64.9	69.8	–4.9	21.8	31.4	–9.6
1998 preliminary	66.9	72.1	–5.2	22.2	32.3	–10.1

NOTES: Performer–reported data are expenditures, and agency–reported data are obligations. Data for 1998 are preliminary. The differences in the two series are derived from unrounded data, not shown in the table.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 1998*, NSF 99–335, by Steven Payson (Arlington, VA: 1999) and NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999, Detailed Statistical Tables,* NSF 99–333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

See figure 2-35 in Volume I.

Appendix table 2-60.
Indicators of Federal technology transfer activities: FYs 1987–98

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Number of active CRADA projects, by Federal agencies												
All Agencies	34	98	271	460	731	1,078	1,628	2,471	3,121	3,688	3,239	3,201
Agriculture	9	51	98	128	177	172	172	208	229	244	273	288
Commerce	0	9	44	82	115	177	292	368	407	406	377	337
Defense	3	10	36	113	193	277	365	563	845	1,086	1,360	1,424
Air Force	0	2	7	13	26	6	25	32	66	223	251	246
Army	3	8	27	80	115	212	260	389	549	531	740	817
Navy	0	0	2	20	52	59	80	142	230	332	369	361
Energy	0	0	0	1	43	250	582	1,094	1,392	1,677	963	868
EPA	0	0	2	11	31	30	28	35	30	35	34	37
HHS	22	28	89	110	144	146	149	147	152	158	161	163
Interior	0	0	1	12	11	1	3	9	15	22	23	30
NASA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Transportation	0	0	0	1	9	17	30	38	37	43	36	39
VA	0	0	1	2	8	8	7	9	14	17	12	15
Patent applications on Federal inventions												
All Agencies	848	1,131	1,466	1,673	1,900	1,817	1,838	1,661	1,740	1,666	1,789	1,844
Agriculture	44	50	71	76	110	70	68	40	80	91	56	64
Commerce	8	15	28	28	18	53	43	41	35	60	49	66
Defense	343	447	616	807	919	850	835	732	759	716	735	755
Air Force	49	47	122	145	178	155	161	122	148	108	100	116
Army	177	203	216	236	274	260	246	232	218	204	192	219
Navy	117	197	278	426	467	435	428	378	393	404	443	420
Energy	252	336	382	366	397	432	497	543	571	564	705	751
EPA	4	5	5	6	8	12	15	15	24	18	13	11
HHS	98	145	225	239	261	224	193	171	166	147	148	132
Interior	5	4	11	15	21	1	2	2	2	2	2	5
NASA	94	129	125	127	165	175	185	116	101	66	79	55
Transportation	0	0	0	1	1	0	0	1	2	2	1	3
VA	NA	NA	3	8	NA	0	0	0	0	0	1	2
Inventions disclosed by Federal laboratory inventors												
All Agencies	2,662	3,047	3,168	3,772	4,213	3,901	3,538	3,753	4,016	4,153	3,842	3,503
Agriculture	83	144	127	158	127	83	110	111	133	129	260	208
Commerce	43	31	49	46	30	55	66	51	65	71	58	40
Defense	953	1,147	1,153	1,383	1,383	1,283	1,189	1,172	1,168	1,115	1,150	1,028
Air Force	83	90	169	160	102	160	140	140	200	190	138	121
Army	248	348	276	376	463	438	413	388	363	338	312	264
Navy	622	709	708	847	959	685	636	644	605	587	700	643
Energy	857	1,003	1,053	1,335	1,666	1,698	1,443	1,588	1,758	1,886	1,500	1,313
EPA	0	0	0	12	20	9	22	19	15	20	9	14

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-60.
Indicators of Federal technology transfer activities: FYs 1987–98

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Inventions disclosed by Federal laboratory inventors–continued												
HHS	194	226	209	215	215	311	282	307	307	305	268	287
Interior	3	6	3	26	26	1	2	2	2	2	5	5
NASA	496	462	532	538	570	416	384	457	532	550	550	554
Transportation	0	0	0	1	2	1	1	1	0	4	2	4
VA	33	28	42	58	33	44	39	45	36	71	40	50
Invention patent licenses granted by Federal agency to industry												
All Agencies	128	129	150	164	206	239	260	337	408	462	502	510
Agriculture	30	24	23	33	29	31	28	9	21	26	22	23
Commerce	0	0	1	0	2	5	3	3	4	10	11	17
Defense	10	10	14	15	25	12	17	16	22	22	34	34
Air Force	1	2	2	4	1	1	3	3	4	6	7	5
Army	3	6	2	3	9	7	3	12	12	19	14	13
Navy	6	2	10	8	15	11	14	13	18	16	13	16
Energy	37	43	57	62	75	81	96	118	140	154	175	162
EPA	0	0	0	1	2	2	2	9	1	2	1	0
HHS	35	42	48	47	69	96	99	151	176	193	208	215
Interior	3	3	0	0	0	0	0	8	3	0	0	0
NASA	13	7	7	6	4	5	12	11	29	36	51	58
Transportation	0	0	0	0	0	0	0	0	0	0	0	1
VA	0	0	0	0	0	0	0	0	0	0	0	0
Income from invention patent licenses by Federal agencies and laboratories in thousands of current dollars												
All Agencies	4,925	6,348	7,337	9,429	18,163	14,070	18,570	26,641	27,922	36,969	50,234	57,563
Agriculture	133	120	420	559	836	1,044	1,483	1,450	1,635	2,091	2,300	2,400
Commerce	34	81	62	52	26	0	0	0	0	0	196	241
Defense	44	49	211	239	286	331	567	1,081	646	836	924	1,560
Air Force	27	31	27	44	43	47	90	59	102	142	190	212
Army	10	5	41	58	113	78	77	110	100	335	256	430
Navy	7	13	143	137	130	206	400	912	444	359	478	918
Energy	346	545	1,499	2,560	3,193	2,369	2,703	2,915	3,455	4,122	8,009	10,536
EPA	0	0	0	3	74	60	75	230	110	300	60	100
HHS	4,245	5,434	4,804	5,839	13,384	10,133	13,584	18,654	19,727	27,277	35,692	39,500
Interior	46	38	61	41	58	0	0	2,000	2,000	2,000	2,000	2,000
NASA	73	79	84	113	292	133	158	311	349	343	1,053	1,226
Transportation	0	0	163	7	14	0	0	0	0	0	0	0
VA	4	2	33	16	0	0	0	0	0	0	0	0

CRADA = cooperative research and development agreement; EPA = Environmental Protection Agency; HHS = Health and Human Services; NASA = National Aeronautics and Space Administration

NA = Not available.

SOURCE: Department of Commerce, Technology Administration (unpublished tabulations).

See figure 2-24 in Volume I.

Appendix table 2-61.
Advanced Technology Program awards: 1990–98

	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Number of awards	11	28	21	29	88	103	8	64	79	431
Single applicants	6	18	18	24	50	62	6	49	52	285
Joint ventures	5	10	3	5	38	41	2	15	27	146
Total participants[a]	35	83	32	50	211	318	12	101	168	1,010
Resubmittals	NA	3	7	6	4	17	2	18	12	69
Funding ($ millions)	98	202	97	118	640	827	37	304	460	2,783
ATP share	46	93	48	60	309	414	19	162	235	1,386
To joint ventures	38	65	19	19	216	304	9	75	143	888
To single applicants	8	28	29	41	93	110	10	87	92	498
Industry share	52	109	49	58	331	413	18	142	225	1,397
From joint ventures	45	83	19	20	233	340	10	81	157	988
From single applicants	7	26	30	38	98	73	8	61	68	409

NA = not available; ATP = Advanced Technology Program

NOTE: Funding of each award is the total in a period of two to five years.

[a]Total participants include single applicants, joint venture leads, and joint venture participants. This category excludes subcontractors, informal collaborators with joint ventures, and collaborators and strategic partners of single applicants.

SOURCE: U.S. Department of Commerce, Advanced Technology Program, unpublished tabulations.

See figure 2-26 in Volume I.

Science & Engineering Indicators - 2000

Appendix table 2-62.
Number of new joint research filings, by year and by selected industry: 1985–98

Year	Total	Petroleum	Chemicals	Machinery	Electrical Equip.	Transportation	Communication Services	All Others
1985	50	2	4	1	6	18	8	11
1986	17	2	3	0	1	3	0	8
1987	26	3	1	1	3	4	6	8
1988	31	4	5	0	5	4	8	5
1989	27	6	1	1	6	2	7	4
1990	46	7	8	1	6	1	16	7
1991	61	17	8	3	4	9	17	3
1992	59	15	4	2	4	5	17	12
1993	73	13	4	5	12	5	21	13
1994	63	10	3	1	16	13	8	12
1995	115	17	9	7	32	15	11	24
1996	97	17	7	10	12	21	9	21
1997	45	5	4	1	6	11	1	17
1998	31	4	4	6	7	4	2	4
Totals	741	122	65	39	120	115	131	149

NOTE: Data based on industry filings to the National Cooperative Research and Production Act, listed in the Federal Register.

SOURCE: A.N. Link, University of North Carolina–Greensboro (unpublished tabulations from CORE database).

See figure 2-25 in Volume I.

Science & Engineering Indicators - 2000

Appendix table 2-63.
International R&D expenditures and R&D as a percentage of GDP: 1981–98

Year	United States	Japan[a]	Germany[b]	France	United Kingdom	Italy	Canada
	Total R&D expenditures in billions of constant 1992 U.S. dollars[c]						
1981	109.5	NA	23.4	16.6	17.3	6.9	5.3
1982	115.2	36.9	24.2	17.7	NA	7.1	5.7
1983	123.1	40.0	24.7	18.3	16.9	7.6	5.8
1984	134.8	43.5	25.5	19.5	NA	8.3	6.3
1985	146.1	48.3	28.3	20.3	18.4	9.6	6.9
1986	149.3	49.0	29.1	20.6	19.3	9.9	7.2
1987	152.0	52.5	31.3	21.5	19.7	10.7	7.2
1988	155.5	56.6	32.4	22.5	20.3	11.4	7.4
1989	158.2	62.0	33.7	23.9	20.9	12.0	7.6
1990	162.4	67.3	34.1	25.4	21.3	12.8	8.0
1991	165.3	68.8	36.6	25.7	19.6	12.4	8.1
1992	165.2	69.2	36.8	26.4	20.6	12.3	8.3
1993	161.2	67.4	35.5	25.8	20.7	11.2	8.8
1994	160.7	66.4	35.5	25.2	20.7	10.8	9.1
1995	170.4	73.6	36.6	25.7	20.1	10.7	9.7
1996	179.4	77.9	36.4	25.4	20.4	11.0	9.9
1997	189.4	80.9	37.6	25.0	20.3	11.9	10.3
1998	201.6	NA	38.6	NA	NA	12.3	10.6
	R&D expenditures as a percentage of GDP						
1981	2.32	NA	2.43	1.97	2.37	0.88	1.25
1982	2.49	2.22	2.52	2.06	NA	0.91	1.40
1983	2.56	2.35	2.52	2.11	2.19	0.95	1.37
1984	2.62	2.43	2.51	2.21	NA	1.01	1.41
1985	2.74	2.58	2.72	2.25	2.23	1.13	1.45
1986	2.72	2.55	2.73	2.23	2.25	1.13	1.49
1987	2.69	2.62	2.88	2.27	2.19	1.19	1.44
1988	2.65	2.66	2.86	2.28	2.14	1.22	1.39
1989	2.61	2.77	2.87	2.33	2.15	1.24	1.39
1990	2.65	2.85	2.75	2.41	2.18	1.30	1.47
1991	2.72	2.82	2.61	2.41	2.11	1.24	1.53
1992	2.65	2.76	2.48	2.42	2.13	1.20	1.54
1993	2.52	2.68	2.42	2.45	2.15	1.14	1.60
1994	2.43	2.63	2.32	2.38	2.11	1.06	1.60
1995	2.52	2.77	2.31	2.34	2.02	1.01	1.58
1996	2.57	2.83	2.30	2.32	1.95	1.02	1.60
1997	2.60	2.92	2.31	2.23	1.87	1.08	1.60
1998	2.67	NA	2.33	NA	NA	1.11	1.60

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-63.
International R&D expenditures and R&D as a percentage of GDP: 1981–98

Year	United States	Japan[a]	Germany[b]	France	United Kingdom	Italy	Canada
	Total R&D expenditures in billions of constant 1990 units of national currency[d]						
1981	102.5	NA	47.3	104.2	9.9	9,288.60	6.5
1982	107.8	6,867.70	48.6	111.3	NA	9,619.30	7.0
1983	115.2	7,428.90	49.5	114.9	9.6	10,246.30	7.1
1984	126.1	7,982.30	50.7	121.5	NA	11,158.20	7.7
1985	136.8	8,857.70	55.8	126.4	10.4	12,765.80	8.4
1986	139.7	9,008.60	57.4	128.3	10.9	13,208.30	8.8
1987	142.3	9,629.50	61.4	133.5	11.1	14,287.60	8.9
1988	145.6	10,367.40	63.4	139.4	11.4	15,193.50	9.0
1989	148.0	11,331.20	65.9	148.2	11.8	15,929.90	9.2
1990	152.0	12,277.50	66.7	157.2	12.0	17,001.20	9.8
1991	154.7	12,587.50	71.2	157.9	11.4	16,395.80	9.9
1992	154.6	12,446.70	68.9	160.4	11.4	15,933.00	10.2
1993	150.9	12,119.50	66.6	160.6	11.8	14,970.30	10.8
1994	150.4	11,994.40	65.6	159.6	12.0	14,286.00	11.3
1995	159.5	12,780.60	66.1	160.4	11.8	13,969.10	11.4
1996	168.0	13,594.70	66.5	161.5	11.7	14,269.80	11.6
1997	177.2	14,217.60	68.5	159.0	11.6	15,354.90	12.1
1998	188.7	NA	70.8	NA	NA	15,912.50	12.5

NA = not available

[a]Due to changes in methodology, data on Japanese R&D in 1996 and later years may not be consistent with data in earlier years.

[b]German data before 1991 are for West Germany only.

[c]Conversions of foreign currencies to U.S. dollars are calculated with purchasing power parity exchange rates. Constant 1992 dollars are based on U.S. GDP implicit price deflators. (See appendix tables 2-1 and 2-2.)

[d]Constant foreign currencies are based on deflation with each country's GDP implicit price deflator.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 1998,* NSF 99-335, by Steven Payson (Arlington, VA: 1999); and Organization for Economic Co-operation and Development, Main Science and Technology Indicators database (Paris: April 1999).

See figures 2-27, 2-28, and 2-30 in Volume I.

Appendix table 2-64.
International nondefense R&D expenditures and R&D as a percentage of GDP: 1981–98

Year	United States	Japan[a]	Germany[b]	France	United Kingdom	Italy	Canada
Total nondefense R&D expenditures in billions of constant 1992 U.S. dollars[c]							
1981	81.7	NA	22.6	13.2	13.5	6.7	5.1
1982	82.8	37.4	23.4	14.3	NA	7.0	5.5
1983	86.5	40.3	23.8	15.1	13.0	7.4	5.6
1984	94.1	43.3	24.6	16.1	NA	8.0	6.1
1985	100.8	48.0	27.0	16.8	14.5	9.1	6.6
1986	102.2	48.6	27.9	16.9	15.6	9.4	6.9
1987	103.7	52.1	29.9	17.5	16.2	10.3	7.0
1988	108.1	56.1	31.0	18.3	17.1	10.8	7.2
1989	114.0	61.5	32.3	19.7	17.6	11.4	7.3
1990	121.2	66.7	32.5	20.5	18.0	12.4	7.8
1991	128.0	68.2	35.2	21.2	16.6	11.9	7.9
1992	129.5	68.4	35.5	22.3	17.8	11.9	NA
1993	126.4	66.6	34.4	22.0	17.9	10.7	8.6
1994	128.6	65.6	34.4	21.8	18.0	10.3	NA
1995	138.6	72.6	35.4	22.4	17.7	10.4	9.5
1996	147.7	77.1	35.0	22.2	18.0	10.9	NA
1997	157.2	NA	36.3	NA	17.9	11.7	10.1
1998	169.4	NA	NA	NA	NA	NA	10.4
Nondefense R&D expenditures as a percentage of GDP							
1981	1.73	NA	2.34	1.57	1.84	0.85	1.21
1982	1.79	2.21	2.44	1.66	NA	0.89	1.35
1983	1.80	2.34	2.43	1.74	1.69	0.93	1.32
1984	1.83	2.41	2.42	1.82	NA	0.97	1.35
1985	1.89	2.56	2.60	1.87	1.76	1.07	1.40
1986	1.86	2.53	2.61	1.84	1.82	1.08	1.43
1987	1.83	2.60	2.75	1.85	1.79	1.15	1.38
1988	1.84	2.63	2.74	1.85	1.80	1.15	1.34
1989	1.88	2.75	2.75	1.92	1.81	1.18	1.34
1990	1.97	2.83	2.62	1.95	1.84	1.26	1.41
1991	2.11	2.79	2.51	1.98	1.79	1.19	1.48
1992	2.07	2.73	2.39	2.04	1.84	1.15	NA
1993	1.98	2.65	2.34	2.10	1.86	1.09	1.56
1994	1.95	2.60	2.25	2.05	1.84	1.01	NA
1995	2.05	2.73	2.23	2.04	1.78	0.98	1.55
1996	2.11	2.80	2.21	2.03	1.72	1.01	NA
1997	2.16	NA	2.23	NA	1.65	1.07	1.57
1998	2.24	NA	NA	NA	NA	NA	1.57

NA = not available

[a]Due to changes in methodology, data on Japanese R&D in 1996 and later years may not be consistent with data in earlier years.

[b]German data before 1991 are for West Germany only.

[c]Conversions of foreign currencies to U.S. dollars are calculated with purchasing power parity exchange rates. Constant 1992 dollars are based on U.S. GDP implicit price deflators. (See appendix tables 2-1 and 2-2.)

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 1998,* NSF 99-335, by Steven Payson (Arlington, VA: 1999); and Organisation for Economic Co-operation and Development, Main Science and Technology Indicators database (Paris: April 1999).

See figures 2-27 and 2-30 in Volume I.

Appendix table 2-65.
International R&D expenditures, by performing sector and source of funds: 1996–98

Country and R&D performer	Total	Sources of R&D funds: Industry	Government	Higher education	Private nonprofit	Abroad	Percent distribution, performers
			Millions of Canadian dollars				
Canada, 1998 total	13,893	6,864	4,434	287	450	1,858	100.0
Industry	8,882	6,449	630	–	–	1,803	63.9
Government	1,856	55	1,794	–	–	7	13.4
Higher education	2,995	339	1,960	287	373	36	21.6
Private nonprofit	160	21	50	–	77	12	1.2
Percent distribution, sources	100.0	49.4	31.9	2.1	3.2	13.4	
			Millions of francs				
France, 1996 total	182,588	88,589	75,765	1,392	1,614	15,228	100.0
Industry	112,373	84,901	14,669	12	31	12,760	61.5
Government	37,008	2,292	33,116	67	36	1,497	20.3
Higher education	30,747	980	27,668	1,180	162	757	16.8
Private nonprofit	2,460	416	312	133	1,385	214	1.3
Percent distribution, sources	100.0	48.5	41.5	0.8	0.9	8.3	
			Millions of Deutsch marks				
Germany, 1998 total	90,440	57,960	30,670	0	205	1,605	100.0
Industry	62,500	56,310	4,850	–	40	1,300	69.1
Government	12,500	450	11,730	–	165	155	13.8
Higher education	15,440	1,200	14,090	–	–	150	17.1
Private nonprofit	–	–	–	–	–	–	0.0
Percent distribution, sources	100.0	64.1	33.9	0.0	0.2	1.8	
			Billions of lire				
Italy, 1998 total	22,501	9,782	11,412	0	0	1,308	100.0
Industry	12,081	9,442	1,603	–	–	1,036	53.7
Government	4,707	120	4,409	–	–	178	20.9
Higher education	5,713	219	5,400	–	–	94	25.4
Private nonprofit	–	–	–	–	–	–	0.0
Percent distribution, sources	100.0	43.5	50.7	0.0	0.0	5.8	
			Billions of yen				
Japan, 1996 total	14,155	10,386	2,645	1,012	97	14	100.0
Industry	10,058	9,916	115	0.25	15	12	71.1
Government	1,329	23	1,305	0.32	0.22	0.02	9.4
Higher education	2,089	49	1,026	1,010	3	0.37	14.8
Private nonprofit	679	398	200	0.87	79	1	4.8
Percent distribution, sources	100.0	73.4	18.7	7.1	0.7	0.1	
			Billions of rubles				
Russia, 1997 total[a]	24,453	7,487	14,900	57	204	1,805	100.0
Industry	16,217	6,697	8,131	9	7	1,373	66.3
Government	6,909	485	5,819	8	193	405	28.3
Higher education	1,312	300	943	40	3	26	5.4
Private nonprofit	15	5	8	–	1	2	0.1
Percent distribution, sources	100.0	30.6	60.9	0.2	0.8	7.4	
			Millions of pounds				
United Kingdom, 1996 total	14,339	6,786	4,564	120	546	2,323	100.0
Industry	9,301	6,401	885	–	5	2,010	64.9
Government	2,069	164	1,796	3	36	71	14.4
Higher education	2,792	188	1,856	116	406	226	19.5
Private nonprofit	177	32	28	1	99	17	1.2
Percent distribution, sources	100.0	47.3	31.8	0.8	3.8	16.2	

Appendix table 2-65.
International R&D expenditures, by performing sector and source of funds: 1996–98

Country and R&D performer	Total	Sources of R&D funds: Industry	Government	Higher education	Private nonprofit	Abroad	Percent distribution, performers
		Millions of U.S. dollars					
United States, 1996 total[b]	196,540	108,558	65,386	4,375	3,218	15,003	100.0
Industry	142,371	106,012	21,356	–	–	15,003	72.4
Government	25,105	–	25,105	–	–		12.8
Higher education	23,721	1,655	16,019	4,375	1,672	–	12.1
Private nonprofit	5,343	891	2,906	–	1,546	–	2.7
Percent distribution, sources	100.0	55.2	33.3	2.2	1.6	7.6	

– = Assumed negligible or no data available

[a]Data for Russia were compiled according to OECD guidelines to be consistent with those presented for the G–7 countries.

[b]For the United States, government as a source of funds includes Federal Government support to all sectors plus state and local governments' support to higher education. Government as a performer includes R&D undertaken in intramural government laboratories plus R&D performance by all federally funded R&D centers (FFRDCs). Sources from abroad represent funding from companies in the United States with foreign ownership of 50 percent or more.

SOURCES: Organisation for Economic Co-operation and Development, unpublished tabulations; Center for Science Research and Statistics; National Science Foundation, Division of Science Resources Studies, *National Patterns of R&D Resources: 1998*, NSF 99-335, by Steven Payson (Arlington, VA: 1999); and U.S. Bureau of Economic Analysis, unpublished tabulations.

See figure 2-31 in Volume I.

Appendix table 2-66.
Distribution of government R&D budget appropriations, by socioeconomic objective: 1997 or 1998
(percentages)

Objective	Country (year of coverage)						
	United States (1998)	Japan[a] (1997)	Germany (1997)	France (1997)	United Kingdom (1997)	Italy (1997)	Canada (1998)
Total (millions of U.S. dollars[b])	73,569	18,309	15,619	13,178	8,887	6,211	3,395
Agriculture, forestry, and fishing	2.1	3.4	2.6	3.6	4.4	2.3	11.7
Industrial development	0.5	6.6	12.8	5.2	1.8	9.1	13.3
Energy	1.3	20.2	3.5	4.8	0.7	4.0	5.7
Infrastructure	2.5	2.7	1.6	0.6	1.7	0.4	4.2
Transport and telecommunications	2.5	1.4	0.8	NA	0.3	NA	4.2
Urban and rural planning	0.1	1.3	0.8	NA	1.4	NA	0.0
Environmental protection	0.8	0.6	3.7	2.0	2.2	2.5	3.3
Health	19.3	4.0	3.4	5.3	14.5	8.5	9.5
Social development and services	1.0	0.9	2.4	0.9	2.0	4.5	3.6
Earth and atmosphere	1.3	1.3	2.0	0.7	1.7	1.4	4.9
Advancement of knowledge	5.9	48.2	53.6	35.7	30.3	59.6	27.1
Advancement of research	5.9	10.8	15.6	19.2	11.8	12.1	8.4
General university funds	–	37.4	38.1	16.5	18.5	47.4	18.7
Civil space	11.1	6.3	4.8	11.0	2.7	4.0	9.2
Defense	54.1	5.8	9.6	27.7	37.7	3.5	5.0
Not elsewhere classified	0.0	0.0	0.0	2.4	0.4	0.0	2.6

NA=not separately available but included in subtotal; – = the United States does not have an equivalent to general university funds

NOTES: Percentages may not add to 100 because of rounding. U.S. data are based on budget authority. For all countries, because of the inclusion of general university funds and slight differences in accounting practices, the distribution of government budgets among socioeconomic objectives may not completely reflect the actual distribution of government–funded research in particular fields.

[a]Japanese data are based on science and technology budget data, which include items other than R&D. Such items are a small proportion of the budget; therefore, the data may still be used as an approximate indicator of relative government emphasis on R&D by objective.

[b]Conversions of foreign currencies to U.S. dollars are calculated with OECD purchasing power parity exchange rates. (See appendix table 2-2.)

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal R&D Funding by Budget Function: Fiscal Years 1998-2000*, NSF 00-303 (Arlington, VA: 2000); Organisation for Economic Co-operation and Development, *Basic Science and Technology Statistics* (unpublished tabulations).

See figure 2-34 in Volume I.

Appendix table 2-67.
International Strategic Technology Alliances: 1980–98
(counts)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
TOTAL	209	200	272	260	345	437	491	488	544	580	434	371	507	556	609	805	704	582	564
Information technology	49	60	96	107	157	164	189	177	200	197	219	203	237	220	253	338	298	227	272
Biotechnology	31	38	54	42	65	113	103	112	100	71	50	40	101	134	165	164	177	172	120
All other, of which	129	102	122	111	123	160	199	199	244	312	165	128	169	202	191	303	229	183	172
New materials	9	23	27	35	28	58	87	65	60	47	35	21	38	59	33	46	36	27	37
Aerospace & defense	22	8	11	11	30	14	27	25	26	45	54	41	56	37	37	52	45	23	19
Automotive	19	7	9	8	8	20	26	22	45	56	12	3	4	15	26	32	37	44	17
Chemicals (non–biotech.)	40	26	30	29	25	32	19	38	58	84	47	40	39	68	52	60	28	42	53
Other	39	38	45	28	32	36	40	49	55	80	17	23	32	23	43	113	83	47	46
USA	139	126	200	177	234	235	292	318	367	357	312	287	394	444	497	639	578	497	477
Information technology	31	39	76	76	105	87	118	133	145	139	174	163	194	196	229	298	262	194	236
Biotechnology	24	28	45	27	51	68	77	78	67	50	32	36	83	116	133	131	148	162	108
All other	84	59	79	74	78	80	97	107	155	168	106	88	117	132	135	210	168	141	133
Europe	102	94	127	111	166	240	242	236	266	320	203	166	233	235	257	330	281	224	245
Information technology	20	28	48	34	75	96	105	84	91	96	81	73	92	67	60	85	75	81	87
Biotechnology	11	14	15	20	24	59	35	51	50	37	28	21	58	59	93	89	102	59	59
All other	71	52	64	57	67	85	102	101	125	187	94	72	83	109	104	156	104	84	99
Japan	53	68	89	97	100	137	160	130	113	126	85	79	79	78	84	111	103	60	70
Information technology	15	18	35	44	55	40	53	31	33	35	46	50	40	40	46	51	47	28	40
Biotechnology	7	11	17	11	11	31	30	26	11	12	9	2	8	15	14	15	21	15	8
All other	31	39	37	42	34	66	77	73	69	79	30	27	31	23	24	45	35	17	22
Across regions	107	114	171	138	179	213	233	242	280	338	210	178	245	273	285	352	332	252	257
Information technology	18	29	71	53	87	69	94	81	91	103	100	88	103	100	99	130	123	101	109
Biotechnology	14	19	26	16	24	52	41	50	37	36	28	22	58	66	87	81	110	73	58
All other, of which	75	66	74	69	68	92	98	111	152	199	82	68	84	107	99	141	99	78	90
New materials	4	15	16	20	15	26	33	30	32	23	24	9	18	31	12	25	11	11	23
Aerospace & defense	12	4	5	6	9	6	7	6	8	20	17	21	28	27	20	25	17	10	9
Automotive	10	3	5	6	5	14	17	17	34	43	3	1	0	7	14	14	16	16	5
Chemicals (non–biotech.)	26	22	22	19	17	24	11	29	45	62	29	26	22	32	31	35	18	21	30
Other	23	22	26	18	22	22	30	29	33	51	9	11	16	10	22	42	37	20	23
USA–Europe	42	33	68	46	76	84	108	116	116	120	93	92	128	135	160	185	177	146	168
Information technology	7	11	31	13	32	27	45	48	41	41	42	38	53	47	45	52	46	53	58
Biotechnology	5	6	9	7	14	22	24	28	21	16	11	18	40	42	62	59	75	49	47
All other	30	16	28	26	30	35	39	40	54	63	40	36	35	46	53	74	56	44	63
USA–Japan	32	35	60	61	58	56	59	54	62	73	48	50	47	46	46	61	56	44	39
Information technology	6	7	26	28	35	20	25	18	19	25	32	34	26	30	29	35	31	19	23
Biotechnology	6	8	12	7	7	16	14	11	6	6	4	1	5	10	7	6	13	14	6
All other	20	20	22	26	16	20	20	25	37	42	12	15	16	6	10	20	12	11	10

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-67.
International Strategic Technology Alliances: 1980–98
(counts)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
USA–Others	14	14	17	7	11	15	13	17	36	34	21	9	27	37	30	41	45	29	15
Information technology	0	1	5	3	2	5	2	5	11	10	10	3	9	10	12	22	22	15	10
Biotechnology	3	2	1	0	2	3	0	3	4	5	4	1	5	7	6	6	7	6	2
All other	11	11	11	4	7	7	11	9	21	19	7	5	13	20	12	13	16	8	3
Europe–Japan	11	20	16	18	21	35	36	26	24	30	25	19	24	20	23	29	25	9	21
Information technology	4	7	6	6	11	12	17	5	9	7	8	11	10	6	8	9	9	4	10
Biotechnology	0	1	2	2	0	7	1	4	1	6	4	0	3	4	6	6	6	1	2
All other	7	12	8	10	10	16	18	17	14	17	13	8	11	10	9	14	10	4	9
Europe–Others	5	10	7	6	10	20	12	21	36	61	22	5	17	31	20	28	20	20	11
Information technology	0	2	2	3	6	5	4	5	10	18	7	1	4	5	1	8	11	7	6
Biotechnology	0	2	1	0	0	3	1	1	4	3	5	1	5	3	6	2	7	3	1
All other	5	6	4	3	4	12	7	15	22	40	10	3	8	23	13	18	2	10	4
Japan–Others	3	2	3	0	3	3	5	8	6	20	1	3	2	4	6	8	9	4	3
Information technology	1	1	1	0	1	0	1	0	1	2	1	1	1	2	4	4	4	3	2
Biotechnology	0	0	1	0	1	1	1	3	1	0	0	1	0	0	0	2	2	0	0
All other	2	1	1	0	1	2	3	5	4	18	0	1	1	2	2	2	3	1	1
Within Regions	102	86	101	122	166	224	258	246	264	242	224	193	262	283	324	453	372	330	307
Information technology	31	31	25	54	70	95	95	96	109	94	119	115	134	120	154	208	175	126	163
Biotechnology	17	19	28	26	41	61	62	62	63	35	22	18	43	68	78	83	67	99	62
All other, of which	54	36	48	42	55	68	101	88	92	113	83	60	85	95	92	162	130	105	82
New materials	5	8	11	15	13	32	54	35	28	24	11	12	20	28	21	21	25	16	14
Aerospace & defense	10	4	6	5	21	8	20	19	18	25	37	20	28	10	17	27	28	13	10
Automotive	9	4	4	2	3	6	9	5	11	13	9	2	4	8	12	18	21	28	12
Chemicals (non–biotech.)	14	4	8	10	8	8	8	9	13	22	18	14	17	36	21	25	10	21	23
Other	16	16	19	10	10	14	10	20	22	29	8	12	16	13	21	71	46	27	23
Intra–USA	51	44	55	63	89	80	112	131	153	130	150	136	192	226	261	352	300	278	255
Information technology	18	20	14	32	36	35	46	62	74	63	90	88	106	109	143	189	163	107	145
Biotechnology	10	12	23	13	28	27	39	36	36	23	13	16	33	57	58	60	53	93	53
All other	23	12	18	18	25	18	27	33	43	44	47	32	53	60	60	103	84	78	57
Intra–Europe	44	31	36	41	59	101	86	73	90	109	63	50	64	49	54	88	59	49	45
Information technology	9	8	9	12	26	52	39	26	31	30	24	23	25	9	6	16	9	17	13
Biotechnology	6	5	3	11	10	27	9	18	24	12	8	2	10	10	19	22	14	6	9
All other	29	18	24	18	23	22	38	29	35	67	31	25	29	30	29	50	36	26	23
Intra–Japan	7	11	10	18	18	43	60	42	21	3	11	7	6	8	9	13	13	3	7
Information technology	4	3	2	10	8	8	10	8	4	1	5	4	3	2	5	3	3	2	5
Biotechnology	1	2	2	2	3	7	14	8	3	0	1	0	0	1	1	1	0	0	0
All other	2	6	6	6	7	28	36	26	14	2	5	3	3	5	3	9	10	1	2

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-67.
International Strategic Technology Alliances: 1980–98
(counts)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Data Addenda[a]																			
USA–Interregion	88	82	145	114	145	155	180	187	214	227	162	151	202	218	236	287	278	219	222
Information technology	13	19	62	44	69	52	72	71	71	76	84	75	88	87	86	109	99	87	91
Biotechnology	14	16	22	14	23	41	38	42	31	27	19	20	50	59	75	71	95	69	55
All other	61	47	61	56	53	62	70	74	112	124	59	56	64	72	75	107	84	63	76
Europe–Interregion	58	63	91	70	107	139	156	163	176	211	140	116	169	186	203	242	222	175	200
Information technology	11	20	39	22	49	44	66	58	60	66	57	50	67	58	54	69	66	64	74
Biotechnology	5	9	12	9	14	32	26	33	26	25	20	19	48	49	74	67	88	53	50
All other	42	34	40	39	44	63	64	72	90	120	63	47	54	79	75	106	68	58	76
Japan–Interregion	46	57	79	79	82	94	100	88	92	123	74	72	73	70	75	98	90	57	63
Information technology	11	15	33	34	47	32	43	23	29	34	41	46	37	38	41	48	44	26	35
Biotechnology	6	9	15	9	8	24	16	18	8	12	8	2	8	14	13	14	21	15	8
All other	29	33	31	36	27	38	41	47	55	77	25	24	28	18	21	36	25	16	20

[a] Counts of these inter–regional strategic technology alliances are included in the totals for across regions listed above. For example, the USA–Interregion totals are the sum of USA–Europe plus USA–Japan plus USA–Others. Total USA alliances are the sum of Intra-USA plus USA-Interregion.

SOURCE: J. Hagedoorn, Maastricht Economic Research Institute on Innovation and Technology (MERIT), Cooperative Agreements and Technology Indicators (CATI) database, unpublished tabulations.

See figure 2-36 and text table 2-18 in Volume I.

Appendix table 2-68.
Company-financed R&D performed abroad by U.S. companies and their foreign subsidiaries, by industry: 1985–97

Industry	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Millions of current U.S. dollars													
Total	3,650	4,624	5,226	6,208	6,706	7,952	9,147	10,063	9,565	9,395	13,052	14,050	13,107
Food, kindred, and tobacco products	75	69	37	27	42	41	66	88	112	117	142	155	148
Chemicals and allied products	843	1,071	1,243	1,548	1,532	2,007	2,401	2,676	2,833	2,456	4,194	3,801	3,867
Industrial and other chemicals	444	579	625	855	609	720	1,009	1,045	1,318	917	1,632	1,720	1,454
Drugs and medicines	399	492	618	693	923	1,287	1,392	1,631	1,561	1,539	2,562	2,082	2,413
Petroleum refining and extraction	47	40	47	59	47	76	107	119	104	111	76	78	91
Stone, clay, and glass products	D	D	D	D	D	59	38	41	38	27	31	32	17
Primary metals	D	D	18	23	24	26	20	18	12	15	26	29	20
Fabricated metal products	21	26	40	D	D	95	86	109	119	125	111	133	132
Machinery	689	951	1,233	1,326	1,432	1,451	1,476	1,439	340	308	501	1,404	1,819
Electrical equipment	591	D	432	591	573	770	651	568	525	495	872	959	981
Transportation equipment	1,025	D	D	1,750	1,916	2,055	2,402	D	D	D	D	D	D
Professional and scientific instruments	169	212	317	404	474	611	656	685	751	900	988	960	1,201
Nonmanufacturing industries	18	27	64	146	256	415	778	835	1,770	1,500	2,206	2,510	1,364
Millions of constant 1992 U.S. dollars[a]													
Total	4,648	5,738	6,292	7,211	7,474	8,496	9,399	10,063	9,319	8,940	12,140	12,828	11,748
Food, kindred, and tobacco products	96	86	45	31	47	44	68	88	109	111	132	142	133
Chemicals and allied products	1,073	1,329	1,497	1,798	1,708	2,144	2,467	2,676	2,760	2,337	3,901	3,470	3,466
Industrial and other chemicals	565	719	752	993	679	769	1,037	1,045	1,284	873	1,518	1,570	1,303
Drugs and medicines	508	611	744	805	1,029	1,375	1,430	1,631	1,521	1,464	2,383	1,901	2,163
Petroleum refining and extraction	60	50	57	69	52	81	110	119	101	106	71	71	82
Stone, clay, and glass products	D	D	D	D	D	63	39	41	37	26	29	29	15
Primary metals	D	D	22	27	27	28	21	18	12	14	24	26	18
Fabricated metal products	27	32	48	D	D	101	88	109	116	119	103	121	118
Machinery	877	1,180	1,484	1,540	1,596	1,550	1,517	1,439	331	293	466	1,282	1,630
Electrical equipment	753	D	520	686	639	823	669	568	511	471	811	876	879
Transportation equipment	1,305	D	D	2,033	2,136	2,196	2,468	D	D	D	D	D	D
Professional and scientific instruments	215	263	382	469	528	653	674	685	732	856	919	876	1,076
Nonmanufacturing industries	23	34	77	170	285	443	799	835	1,724	1,427	2,052	2,292	1,223

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-68.
Company-financed R&D performed abroad by U.S. companies and their foreign subsidiaries, by industry: 1985–97

Industry	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
							Percentage of domestic funding						
Total	6.4	7.7	8.5	9.3	9.1	9.7	10.1	10.7	10.1	9.7	12.0	11.6	9.8
Food, kindred, and tobacco products	6.6	5.4	3.1	2.3	3.4	3.3	5.2	6.3	8.3	7.9	9.1	9.9	8.3
Chemicals and allied products	10.1	12.4	13.2	14.3	12.8	15.2	16.6	17.7	17.0	14.8	24.2	21.7	20.8
Industrial and other chemicals	9.2	11.6	11.7	14.4	9.5	9.9	13.5	14.6	17.5	13.2	22.9	22.2	20.6
Drugs and medicines	11.5	13.5	15.1	14.1	16.7	21.8	20.0	20.6	17.1	16.0	25.1	21.3	20.8
Petroleum refining and extraction	2.1	2.0	2.5	3.0	2.2	3.3	4.3	5.2	4.9	5.7	4.3	4.8	5.6
Stone, clay, and glass products	D	D	D	D	D	11.0	8.4	8.6	7.2	4.9	7.0	6.9	2.8
Primary metals	D	D	2.5	3.7	3.6	3.6	2.8	3.5	1.9	2.2	4.5	4.6	2.6
Fabricated metal products	2.7	3.3	6.3	D	D	12.9	11.5	15.1	12.7	14.4	11.8	10.1	7.9
Machinery	6.4	8.9	11.7	11.1	10.7	10.7	10.8	10.4	4.1	3.8	5.2	10.5	9.9
Electrical equipment	6.4	D	4.1	5.9	6.0	8.3	7.3	6.0	4.5	3.7	5.1	4.7	4.3
Transportation equipment	8.5	D	D	12.6	13.1	14.4	16.2	D	D	D	D	D	D
Professional and scientific instruments	3.7	4.5	6.4	7.6	8.3	9.7	9.6	9.4	10.0	11.2	11.6	11.7	13.4
Nonmanufacturing industries	0.4	0.6	1.2	2.0	2.5	2.5	3.4	3.6	7.2	6.3	8.0	8.6	4.2

D = withheld to avoid disclosing operations of individual companies

[a]See appendix table 2-1 for GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Research and Development in Industry: 1997,* NSF 99-358 (Arlington, VA: 1999).

See figure 2-39 in Volume I.

Appendix table 2-69.
Expenditures for R&D performance by majority-owned nonbank foreign affiliates of U.S. parent companies, by region/country: 1982, 1989, and 1994–96
(Millions of U.S. dollars)

Region/country	1982	1989	1994	1995	1996
Total	3,851	7,922	11,877	12,582	14,181
Canada	505	975	836	1,068	1,582
Europe	2,892	5,475	8,676	9,144	9,651
Belgium	223	313	469	292	369
France	332	521	1,372	1,271	1,326
Germany	1,079	1,726	2,849	3,068	3,061
Ireland	9	156	396	171	193
Italy	150	393	365	346	553
Netherlands	65	367	415	495	545
Spain	40	58	D	288	317
Sweden	28	31	72	691	439
Switzerland	60	59	191	242	189
United Kingdom	824	1,718	2,158	1,935	2,133
Other European countries	82	133	D	345	526
Asia and Pacific	238	1,272	1,775	1,865	2,073
Japan	112	1,000	1,130	1,286	1,337
Australia	114	190	230	287	409
Singapore	D	24	167	63	88
Other Asian and Pacific countries	D	58	248	229	239
Latin America and other Western Hemisphere	169	155	477	389	687
Brazil	97	92	238	249	489
Mexico	30	37	183	58	119
Other Latin America	42	26	56	82	79
Middle East	11	33	98	97	166
Israel	11	29	96	97	166
Other Middle East countries	D	4	2	D	D
Africa	25	11	15	19	21
South Africa	23	9	14	17	18
Other African countries	2	2	1	2	3

D = withheld to avoid disclosing operations of individual companies

NOTES: Includes expenditures for R&D conducted by affiliates, whether for themselves or for others under contract. They exclude expenditures for R&D conducted by others for affiliates under a contract. (These data series differ from those reported in previous *Science & Engineering Indicators* reports.) Benchmark survey statistics are reported for 1982, 1989, and 1994. Expenditures reported here differ from the National Science Foundation data reported in appendix table 2-68.

SOURCE: U.S. Bureau of Economic Analysis, *U.S. Direct Investment Abroad: Operations of U.S. Parent Companies and Their Foreign Affiliates* (Washington, DC: U.S. Government Printing Office, annual series).

See figures 2-37 and 2-40 in Volume I.

Appendix table 2-70.
Foreign R&D expenditures in the United States, by industry and region/country: 1980–96
(Millions of current dollars)

Industry and region/country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Total	1,946	3,110	3,744	4,164	4,738	5,240	5,804	6,521	7,834	9,465	11,522	11,872	13,864	14,199	15,566	17,542	17,150
Expenditures by industry																	
Petroleum	D	253	255	310	366	388	380	311	364	387	520	438	586	428	407	403	436
Manufacturing	D	2,645	3,133	3,553	4,058	4,478	5,011	5,573	6,903	8,398	9,868	10,177	11,383	11,842	12,970	14,756	13,807
Food and kindred products	19	32	39	44	43	51	54	58	106	187	192	195	245	266	294	360	353
Chemicals and allied products	834	1,580	1,870	2,037	2,349	2,627	2,782	3,220	3,719	4,371	5,243	5,755	D	6,580	7,003	8,263	7,366
Industrial chemicals	454	1,085	1,329	1,397	1,620	1,836	1,657	1,899	2,126	2,284	2,498	2,391	D	1,906	1,993	2,531	958
Other chemicals	146	179	170	181	200	228	167	230	276	252	372	427	490	442	504	530	560
Drugs and medicines	234	316	371	459	529	563	958	1,091	1,318	1,835	2,373	2,937	3,211	4,232	4,506	5,201	5,849
Primary metal industries	24	71	79	59	66	102	97	91	102	155	166	189	173	201	170	161	156
Fabricated metal products	21	20	28	82	54	64	76	67	106	209	152	145	D	172	178	161	131
Machinery, except electrical	189	284	297	350	355	342	286	476	692	1,070	1,190	1,094	1,098	1,019	954	1136	935
Office and computing machines	NA	NA	NA	NA	NA	NA	NA	370	497	622	794	788	774	624	479	595	402
Other	NA	NA	NA	NA	NA	NA	NA	106	195	448	396	306	324	395	475	541	533
Electrical equipment	318	385	505	613	799	977	1,366	1,105	1,389	1,371	1,817	1,647	1,953	2,168	2,613	2,855	2,954
Transportation equipment	101	136	150	92	95	83	124	76	225	265	193	207	D	266	375	424	454
Professional and scientific instruments	32	52	47	42	42	58	112	279	242	366	420	472	D	581	671	691	720
Nonmanufacturing industries	D	212	356	301	314	374	413	637	567	680	1,134	1,257	1,895	1,929	2,189	2,383	2,907
Services	37	43	41	51	60	54	77	243	69	108	384	358	744	932	996	749	996
Other	D	169	315	250	254	320	336	394	498	572	750	899	1,151	997	1,193	1,108	1,911
Expenditures by region/country																	
Canada	135	777	1,032	1,212	1,405	1,550	1,542	1,666	1,804	1,758	1,944	2,060	2,113	2,159	2,332	1,395	1,397
Europe	1,544	1,936	2,229	2,324	2,632	2,918	3,450	3,881	4,754	6,022	7,520	7,785	8,993	9,362	10,313	13,201	12,516
United Kingdom	312	405	520	559	664	748	764	833	1,171	1,645	1,889	2,046	2,177	2,211	2,499	2,428	2,525
Germany	380	436	529	591	602	671	851	1,139	1,242	1,503	1,764	1,720	2,100	2,209	2,425	3,869	3,084
France	146	204	232	215	261	166	352	366	435	572	812	953	1,204	1,235	1,449	1,604	1,712
Netherlands	299	373	397	387	432	514	517	542	618	703	784	663	696	697	736	818	948
Switzerland	338	416	447	463	546	625	744	765	962	1,195	1,669	1,849	2,064	2,423	2,444	3,092	3,375
Sweden	36	53	54	62	63	116	141	128	166	214	281	237	308	200	289	781	276
Other European countries	33	49	50	47	64	78	81	108	160	190	321	317	444	387	471	609	596
Japan	88	142	141	171	210	267	292	307	571	822	1,307	1,353	1,709	1,801	1,790	1,874	2,070
Latin America	D	D	D	401	423	427	427	391	352	400	386	397	580	539	637	323	386
All other countries	D	D	D	56	68	78	93	276	353	463	365	277	469	338	494	768	781

D = withheld to avoid disclosing operations of individual companies; NA = not available

NOTES: The data include foreign direct investments of nonbank U.S. affiliates with 10 percent or more foreign ownership and exclude expenditures for R&D conducted for others under a contract.

SOURCE: U.S. Bureau of Economic Analysis, *Foreign Direct Investment in the United States: Operations of U.S. Affiliates of Foreign Companies* (Washington, DC: U.S. Government Printing Office, annual series).

Appendix table 2-71.

R&D expenditures in the United States by majority-owned nonbank U.S. affiliates of foreign companies, by industry of affiliate and country of ultimate beneficial owner: 1980 and 1987–96

(Millions of current dollars)

Industry and region/country	1980	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Total	1,517	4,497	5,485	6,720	8,511	9,127	10,745	11,262	12,671	14,846	15,003
Expenditures by industry											
Petroleum	175	283	339	378	D	D	551	420	400	399	430
Manufacturing	1,245	3,809	4,773	5,915	7,282	7,839	9,056	9,560	10,855	12,828	12,553
Food and kindred products	19	58	105	185	189	190	240	260	283	355	348
Chemicals and allied products	733	D	D	D	3,832	4,266	4,692	5,167	5,654	7,185	6,760
Industrial and other chemicals	501	D	D	D	1,465	D	D	D	1,429	2,904	1,357
Drugs and medicines	232	1,075	1,293	1,806	2,367	D	D	D	4,225	4,281	5,403
Rubber products	8	50	98	117	155	150	305	216	210	209	229
Stone, clay, and glass products	10	32	61	62	114	102	113	106	151	D	157
Primary metal industries	D	38	37	75	69	82	79	83	77	62	69
Fabricated metal products	D	62	100	201	138	132	136	155	165	150	106
Machinery, except electrical	92	D	446	556	645	602	609	529	551	673	651
Computer and office equipment	28	D	285	295	380	341	328	247	203	286	268
Other	65	79	161	260	264	261	281	282	348	388	383
Electrical and electronic equipment	285	D	1,114	1,078	1,533	1,562	1,880	2,061	2,549	2,743	2,863
Household audio & video, and comm. equip.	66	555	777	721	971	959	1,129	1,133	1,345	1,570	1,627
Electronic components and other	219	D	337	357	562	603	752	928	1,204	254	280
Transportation equipment	10	D	D	D	106	159	203	231	331	381	416
Professional and scientific instruments	28	254	210	295	333	411	556	524	578	606	637
Nonmanufacturing industries	97	405	373	427	D	D	1,138	1,282	1,416	1,619	2,020
Services	5	59	42	77	D	D	211	420	455	308	361
Wholesale trade	69	312	300	297	571	682	803	745	839	1178	1,533
Motor vehicles and equipment	D	86	67	71	283	277	252	220	182	285	370
Electrical goods	5	71	107	D	145	224	220	157	236	338	498
Other	23	34	31	53	D	D	124	117	122	555	665

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-71.
R&D expenditures in the United States by majority-owned nonbank U.S. affiliates of foreign companies, by industry of affiliate and country of ultimate beneficial owner: 1980 and 1987–96
(Millions of current dollars)

Industry and region/country	1980	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
						Expenditures by region/country					
Canada	113	D	D	D	D	D	D	D	D	1,337	1,380
Europe	1,217	3,458	4,241	5,414	6,762	7,275	8,325	8,628	9,487	11,442	11,245
France	39	332	402	510	766	913	1,230	1,190	1,383	1,529	1,514
Germany	281	824	963	1,216	1,435	1,596	1,855	2,003	2,147	3,563	2,748
Italy	D	D	73	93	151	143	91	132	157	172	127
Netherlands	D	540	615	690	757	642	685	674	719	786	930
Sweden	D	124	160	205	271	225	322	180	263	D	253
Switzerland	329	D	D	1,060	1,455	1,637	1,873	2,117	2,127	2,490	2,717
United Kingdom	247	790	1,085	1,568	1,809	1,987	2,090	2,139	2,428	2,316	2,442
Other European countries	16	47	D	72	118	132	179	193	263	D	514
Asia and Pacific	D	179	345	412	796	834	1,080	1,232	1,397	1,611	1,863
Japan	D	133	282	369	709	741	938	1,112	1,200	1,259	1,491
Other	D	46	63	43	87	93	142	120	197	352	372
Latin America & other Western Hemisphere	155	329	302	352	314	330	534	D	610	317	353
Middle East	2	14	9	10	9	9	20	38	62	72	95
Africa	D	D	D	D	D	D	4	5	2	D	D

D = withheld to avoid disclosing operations of individual companies

NOTES: The data include foreign direct investments of nonbank U.S. affiliates with 50 percent or more foreign ownership. These R&D expenditures are a subset of total foreign R&D expenditures reported in appendix table 2–70. The data exclude expenditures for R&D conducted for others under a contract.

SOURCE: U.S. Bureau of Economic Analysis, unpublished tabulations.

See figures 2-37, 2-41, and 2-42 in Volume I.

Appendix table 2-72.
Proportion of industrial R&D expenditures financed from foreign sources, by selected country: 1980-98
(Percentages)

	Canada	France	Germany[a]	Italy	Japan	United Kingdom
1980	5.8	6.5	NA	4.0	0.1	NA
1981	7.4	7.0	1.2	4.3	0.1	8.7
1982	10.7	4.8	1.3	4.7	0.1	NA
1983	16.6	4.6	1.4	4.3	0.1	6.8
1984	17.1	6.5	1.5	6.2	0.1	NA
1985	14.3	6.9	1.4	6.1	0.1	11.1
1986	13.6	8.0	1.4	7.3	0.1	12.2
1987	16.8	8.7	1.5	6.9	0.1	12.0
1988	18.0	9.2	2.1	6.6	0.1	12.0
1989	16.7	10.9	2.7	6.5	0.1	13.4
1990	17.4	11.1	2.7	7.3	0.1	15.5
1991	18.2	11.4	2.6	9.6	0.1	16.0
1992	NA	12.0	2.5	6.3	0.1	15.0
1993	17.7	11.3	1.9	6.8	0.1	15.4
1994	NA	11.2	2.0	9.5	0.1	16.0
1995	20.8	11.1	2.2	8.1	0.1	18.9
1996	NA	11.4	2.2	7.9	0.1	21.6
1997	20.7	NA	2.2	8.4	NA	NA
1998	20.3	NA	2.1	NA	NA	NA

NA = not available

[a]German data before 1991 are for West Germany only.

SOURCE: Organisation for Economic Co-Operation and Development, Main Science and Technology Indicators database (Paris: April 1999).

See figure 2-32 in Volume I.

Science & Engineering Indicators - 2000

Appendix table 3-1.
U.S. scientists and engineers, by S&E degree status and labor force status: 1997

S&E degree status	Total	Labor Force Status				
		Employed			Unemployed	Not in labor force
		Total	In S&E	In non-S&E		
Scientists and engineers, total	12,530,700	10,585,600	3,369,400	7,216,200	193,700	1,751,400
Educated in S&E	11,962,100	10,057,600	3,074,800	6,982,800	187,300	1,717,200
Highest degree is in S&E	9,269,200	7,704,000	2,840,800	4,863,200	150,500	1,414,700
Highest degree is in non-S&E	2,692,900	2,353,600	234,000	2,119,600	36,700	302,500
No S&E degree*	568,600	528,000	294,600	233,400	6,400	34,100

*The persons without S&E degrees or jobs in 1997 represent individuals who had S&E jobs in 1993, but had later moved to non-S&E jobs, became unemployed, or had moved out of the labor force.

NOTES: The term "Scientists and Engineers" (S&Es) includes all persons who have ever received a bachelor's degree or higher in a science or engineering (S&E) field, plus persons holding a non-S&E bachelor's or higher degree who were employed in a S&E occupation during either the 1993, 1995 or 1997 SESTAT surveys. Figures are rounded to nearest hundred. Details may not add to total because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System, 1997.

See page 3-3 in Volume 1.

Appendix table 3-2.
Educational attainment of employed U.S. scientists and engineers, by level and field of highest degree and broad occupation category: 1997

Field of highest degree	All occupations, total		Occupation					
			Computer/ math scientists	Life/ related scientists	Physical/ related scientists	Social/ related scientists	Engineers	Non-S&E occupations
	Number	Percent	Percent					
All degree levels, total[a]								
All degree fields, total	10,585,600	100.0	9.8	3.0	2.7	3.3	13.0	68.2
S&E degree fields, total	7,704,000	100.0	10.5	3.6	3.5	3.7	15.5	63.1
Sciences, total	5,794,700	100.0	10.9	4.7	4.4	4.9	2.3	72.8
Computer/math sciences, total	1,003,300	100.0	45.4	0.2	0.4	0.2	3.1	50.7
Computer/information sciences	543,800	100.0	58.4	0.1	0.1	0.1	2.6	38.7
Mathematical sciences	459,500	100.0	29.9	0.3	0.8	0.4	3.8	64.8
Life/related sciences, total	1,204,700	100.0	2.3	19.5	3.1	0.4	1.8	72.9
Agricultural/food sciences	218,700	100.0	1.7	18.5	1.3	0.2	1.7	76.5
Biological sciences	889,100	100.0	2.2	20.4	3.1	0.4	1.3	72.5
Environmental life sciences	96,900	100.0	3.8	13.8	6.4	0.6	6.9	68.4
Physical/related sciences, total	619,200	100.0	7.1	3.1	33.8	0.3	9.7	46.0
Chemistry, except biochemistry	275,100	100.0	3.7	5.2	38.3	0.1	6.0	46.7
Earth science, geology and oceanography	146,900	100.0	4.9	1.0	41.6	0.2	6.1	46.2
Physics/astronomy	144,100	100.0	16.6	1.4	27.3	0.8	19.6	34.4
Other physical sciences	53,000	100.0	5.3	2.6	5.8	0.6	11.5	74.2
Social/related sciences, total	2,967,600	100.0	3.5	0.5	0.2	9.4	0.6	85.8
Economics	402,800	100.0	5.3	0.7	0.3	8.4	1.0	84.3
Political/related sciences	558,700	100.0	3.4	0.3	0.2	4.8	0.8	90.5
Psychology	1,112,800	100.0	3.2	0.6	S	15.5	0.6	80.1
Sociology/anthropology	558,600	100.0	2.1	0.4	0.1	6.1	0.3	90.9
Other social sciences	334,800	100.0	4.9	0.3	0.7	3.4	0.7	90.0
Engineering, total	1,909,200	100.0	9.4	0.2	0.8	0.1	55.7	33.8
Aerospace/related engineering	77,400	100.0	8.9	0.1	0.5	S	47.0	43.4
Chemical engineering	138,400	100.0	3.0	0.4	3.0	0.1	61.2	32.3
Civil/architectural engineering	322,300	100.0	2.0	S	0.3	0.1	61.7	35.8
Electrical/related engineering	582,100	100.0	19.4	0.1	0.3	0.1	52.5	27.6
Industrial engineering	105,400	100.0	10.7	S	S	0.3	36.7	52.2
Mechanical engineering	386,100	100.0	4.9	0.2	0.2	S	64.4	30.3
Other engineering	297,500	100.0	6.5	0.7	2.5	0.1	50.5	39.8
Non-S&E degrees, total	2,881,700	100.0	7.9	1.7	0.5	2.1	6.2	81.7
Business/management	703,100	100.0	16.4	0.9	0.5	1.5	11.6	69.1
Education	434,200	100.0	6.9	1.5	0.2	3.6	1.8	86.0
Health	589,900	100.0	0.7	3.8	0.8	0.8	0.5	93.4
Other non-S&E	1,154,500	100.0	6.8	1.1	0.4	2.5	7.5	81.7

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-2.
Educational attainment of employed U.S. scientists and engineers, by level and field of highest degree and broad occupation category: 1997

Field of highest degree	All occupations, total		Occupation					
			Computer/ math scientists	Life/ related scientists	Physical/ related scientists	Social/ related scientists	Engineers	Non-S&E occupations
	Number	Percent	Percent					
Bachelor's, total								
All degree fields, total	6,193,700	100.0	10.9	2.0	2.1	1.1	14.8	69.1
S&E degree fields, total	5,683,700	100.0	9.7	2.0	2.2	1.2	14.7	70.3
Sciences, total	4,303,400	100.0	10.1	2.6	2.8	1.5	2.1	81.0
Computer/math sciences, total	721,600	100.0	41.5	0.2	0.4	0.1	2.5	55.3
Computer/information sciences	385,000	100.0	57.5	S	0.2	0.1	1.8	40.5
Mathematical sciences	336,600	100.0	23.3	0.3	0.8	0.2	3.1	72.2
Life/related sciences, total	884,500	100.0	2.3	10.4	2.7	0.2	1.9	82.3
Agricultural/food sciences	175,200	100.0	1.8	11.4	0.7	0.2	1.7	84.2
Biological sciences	634,500	100.0	2.3	10.2	3.1	0.2	1.5	82.6
Environmental life sciences	74,800	100.0	3.9	10.4	4.3	0.3	5.6	75.5
Physical/related sciences, total	381,900	100.0	7.4	2.2	23.3	0.3	10.6	56.2
Chemistry, except biochemistry	176,100	100.0	4.4	3.6	29.0	0.1	6.5	56.3
Earth science, geology and oceanography	96,300	100.0	5.4	0.5	29.6	0.2	7.3	56.9
Physics/astronomy	68,800	100.0	20.1	1.0	12.5	1.0	24.6	41.0
Other physical sciences	40,700	100.0	3.4	1.7	2.0	0.7	12.5	79.9
Social/related sciences, total	2,315,500	100.0	3.7	0.4	0.1	2.6	0.7	92.6
Economics	337,300	100.0	5.6	0.5	0.4	2.6	1.1	89.8
Political/related sciences	476,100	100.0	3.5	0.4	0.1	1.6	0.8	93.7
Psychology	750,000	100.0	3.6	0.4	0.1	3.7	0.5	91.7
Sociology/anthropology	496,300	100.0	2.2	0.4	0.1	2.4	0.4	94.6
Other social sciences	255,900	100.0	4.5	0.2	0.3	1.7	0.7	92.6
Engineering, total	1,380,300	100.0	8.4	0.1	0.6	0.1	53.9	36.9
Aerospace/related engineering	55,200	100.0	9.6	S	0.2	S	43.5	46.6
Chemical engineering	102,100	100.0	2.7	0.3	2.8	0.2	59.5	34.7
Civil/architectural engineering	243,800	100.0	1.8	S	0.1	S	60.5	37.5
Electrical/related engineering	413,200	100.0	18.2	S	0.3	0.2	50.8	30.4
Industrial engineering	79,300	100.0	7.4	S	S	0.3	33.4	58.9
Mechanical engineering	308,500	100.0	4.1	0.2	0.1	S	63.4	32.2
Other engineering	178,200	100.0	5.3	0.3	1.6	0.1	44.8	47.9
Non-S&E degrees, total	510,000	100.0	24.7	2.5	0.9	0.5	16.1	55.3
Business/management	161,200	100.0	35.7	2.9	0.2	0.4	7.7	53.1
Education	48,800	100.0	22.5	1.4	0.2	S	10.2	65.6
Health	59,700	100.0	3.2	4.2	4.2	S	2.5	85.8
Other non-S&E	240,400	100.0	23.2	2.1	0.7	0.6	26.2	47.1

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-2.
Educational attainment of employed U.S. scientists and engineers, by level and field of highest degree and broad occupation category: 1997

Field of highest degree	All occupations, total		Occupation					
			Computer/ math scientists	Life/ related scientists	Physical/ related scientists	Social/ related scientists	Engineers	Non-S&E occupations
	Number	Percent	Percent					
Master's, total								
All degree fields, total	2,819,800	100.0	10.7	2.5	2.5	5.4	13.3	65.7
S&E degree fields, total	1,431,600	100.0	14.7	3.7	4.2	7.6	19.8	50.0
Sciences, total	1,001,000	100.0	15.5	5.2	5.5	10.8	3.0	60.0
Computer/math sciences, total	244,700	100.0	51.8	0.1	0.3	0.5	5.2	42.1
Computer/information sciences	148,800	100.0	59.7	0.1	0.1	0.2	4.4	35.6
Mathematical sciences	95,800	100.0	39.5	0.1	0.7	0.9	6.4	52.4
Life/related sciences, total	156,600	100.0	2.3	29.0	4.6	1.0	2.3	60.8
Agricultural/food sciences	26,700	100.0	1.9	34.8	3.7	S	2.2	57.3
Biological sciences	112,500	100.0	2.1	29.1	3.3	1.2	1.0	63.4
Environmental life sciences	17,400	100.0	4.0	19.5	14.4	1.1	10.9	50.0
Physical/related sciences, total	114,500	100.0	8.4	3.0	40.3	0.3	9.6	38.7
Chemistry, except biochemistry	36,500	100.0	2.5	6.0	44.9	S	6.8	39.7
Earth science, geology and oceanography	34,400	100.0	4.9	2.0	58.1	S	4.7	30.2
Physics/astronomy	33,200	100.0	17.2	0.3	24.4	0.9	18.7	38.9
Other physical sciences	10,500	100.0	13.3	2.9	15.2	S	6.7	61.9
Social/related sciences, total	485,300	100.0	3.2	0.6	0.3	21.6	0.6	73.7
Economics	44,000	100.0	5.0	1.6	S	22.5	0.2	70.7
Political/related sciences	66,000	100.0	2.9	S	0.3	13.8	0.8	82.3
Psychology	271,500	100.0	2.5	0.6	S	28.1	0.7	68.0
Sociology/anthropology	39,500	100.0	1.8	0.3	S	18.7	0.3	78.7
Other social sciences	64,300	100.0	5.9	0.5	1.6	3.7	0.5	87.7
Engineering, total	430,600	100.0	12.9	0.2	1.2	0.1	58.8	26.8
Aerospace/related engineering	18,200	100.0	6.0	S	0.5	S	52.7	40.1
Chemical engineering	23,000	100.0	4.3	0.4	3.9	S	64.3	26.5
Civil/architectural engineering	69,200	100.0	2.7	S	0.7	0.3	63.3	32.8
Electrical/related engineering	142,700	100.0	23.5	S	0.3	S	55.6	20.6
Industrial engineering	22,800	100.0	21.5	S	S	0.4	46.5	31.6
Mechanical engineering	65,800	100.0	8.4	S	0.6	S	67.0	24.0
Other engineering	89,100	100.0	8.5	0.8	3.4	0.1	57.4	29.9
Non-S&E degrees, total	1,388,200	100.0	6.5	1.3	0.6	3.1	6.7	81.9
Business/management	525,200	100.0	10.9	0.3	0.6	1.6	13.2	73.4
Education	334,900	100.0	4.2	1.1	0.1	3.3	0.7	90.4
Health	95,200	100.0	1.8	6.2	2.3	4.3	1.4	84.1
Other non-S&E	432,900	100.0	4.0	1.5	0.5	4.4	4.5	85.1

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-2.
Educational attainment of employed U.S. scientists and engineers, by level and field of highest degree and broad occupation category: 1997

Field of highest degree	All occupations, total		Occupation					
			Computer/ math scientists	Life/ related scientists	Physical/ related scientists	Social/ related scientists	Engineers	Non-S&E occupations
	Number	Percent	Percent					
Doctorate, total								
All degree fields, total	696,000	100.0	8.5	16.1	12.0	17.4	11.4	34.7
S&E degree fields, total	580,300	100.0	8.8	18.8	14.4	19.0	13.3	25.8
Sciences, total	482,000	100.0	8.7	22.4	16.7	22.9	2.4	26.9
Computer/math sciences, total	36,900	100.0	77.5	0.5	1.1	0.3	3.3	17.3
Computer/information sciences	9,700	100.0	77.3	1.0	S	S	4.1	17.5
Mathematical sciences	27,200	100.0	77.6	0.4	1.5	0.4	2.9	17.3
Life/related sciences, total	162,500	100.0	1.8	59.9	3.4	0.8	0.8	33.3
Agricultural/food sciences	16,800	100.0	1.2	67.3	3.6	0.6	1.2	26.2
Biological sciences	141,200	100.0	1.9	59.3	3.1	0.7	0.6	34.4
Environmental life sciences	4,500	100.0	2.2	51.1	8.9	4.4	6.7	24.4
Physical/related sciences, total	122,200	100.0	5.2	6.1	60.5	0.2	7.0	21.1
Chemistry, except biochemistry	62,500	100.0	2.4	9.0	60.8	S	4.0	23.7
Earth science, geology and oceanography	16,100	100.0	2.5	1.2	77.0	0.6	2.5	16.1
Physics/astronomy	41,800	100.0	10.5	2.9	54.3	0.2	12.7	19.4
Other physical sciences	1,800	100.0	S	22.2	38.9	S	16.7	16.7
Social/related sciences, total	160,500	100.0	2.6	1.7	0.6	67.6	0.4	27.1
Economics	21,500	100.0	2.3	0.9	0.5	70.2	S	26.0
Political/related sciences	16,500	100.0	1.8	S	1.2	62.4	0.6	35.2
Psychology	85,000	100.0	1.9	2.6	S	75.2	0.4	20.0
Sociology/anthropology	22,800	100.0	2.6	1.8	0.4	64.5	S	31.1
Other social sciences	14,600	100.0	8.2	0.7	3.4	31.5	1.4	54.8
Engineering, total	98,200	100.0	9.1	1.2	2.7	0.1	66.6	20.3
Aerospace/related engineering	4,000	100.0	12.5	S	2.5	S	70.0	15.0
Chemical engineering	13,300	100.0	3.0	1.5	2.3	S	69.2	24.8
Civil/architectural engineering	9,400	100.0	3.2	S	2.1	S	78.7	14.9
Electrical/related engineering	26,300	100.0	16.3	0.4	1.5	S	61.2	20.5
Industrial engineering	3,300	100.0	15.2	S	S	S	51.5	33.3
Mechanical engineering	11,800	100.0	5.9	0.8	1.7	S	77.1	14.4
Other engineering	30,100	100.0	7.6	2.7	5.0	0.3	63.5	21.3
Non-S&E degrees, total	115,800	100.0	6.9	2.3	0.3	9.1	2.2	79.2
Business/management	12,000	100.0	3.3	S	S	9.2	S	86.7
Education	43,200	100.0	11.3	4.4	0.9	10.6	0.5	72.2
Health	S	S	S	S	S	S	S	S
Other non-S&E	60,600	100.0	4.5	1.3	S	7.9	3.8	82.5

S = suppressed for reasons of confidentiality and/or data reliability

[a]Includes professional degrees.

NOTES: The term "Scientists and Engineers" (S&Es) includes all people who have ever received a bachelor's degree or higher in an S&E field, plus people holding a non-S&E bachelor's or higher degree who were employed in an S&E occupation during either the 1993, 1995, or 1997 SESTAT surveys. Figures are rounded to nearest hundred. Details may not add to total because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See page 3-4 in Volume 1.

Appendix table 3-3
Employed U.S. scientists and engineers, with job closely related to field of highest degree, by degree level, field of highest degree, and years since degree: 1997
(Percent)

Field of highest degree	Employed S&Es, total	Years since degree							
		1–5 years	6–10 years	11–15 years	16–20 years	21–25 years	26–30 years	31–35 years	36+ years
All degree levels									
All science & engineering	44.8	48.0	50.9	48.6	44.2	37.7	37.9	39.4	37.8
Engineering	53.5	56.8	54.4	55.8	57.0	49.4	48.4	47.1	48.1
Aerospace engineering	41.9	46.0	44.1	48.6	40.3	31.1	34.0	NA	NA
Chemical engineering	46.4	50.0	52.1	45.6	38.2	39.6	51.6	41.8	52.8
Civil engineering	66.6	69.2	69.4	71.7	63.6	65.8	63.1	61.5	63.3
Electrical engineering	55.6	58.3	55.9	58.3	64.2	47.2	46.5	48.2	53.7
Industrial engineering	37.1	42.8	32.7	30.8	55.4	36.7	31.5	NA	28.3
Mechanical engineering	50.6	52.4	53.3	53.1	61.2	44.6	46.6	41.4	40.8
Other engineering	50.9	58.4	52.0	54.5	47.0	51.1	44.7	44.9	42.2
Life sciences	47.2	51.1	60.5	49.7	43.4	38.9	40.4	47.6	36.5
Agriculture	47.4	57.2	56.5	40.0	50.1	44.1	38.1	65.6	22.3
Biological sciences	47.5	50.7	61.0	52.6	42.1	38.8	40.5	43.1	42.9
Health/medical	44.3	45.5	63.6	51.7	37.4	30.7	48.1	NA	NA
Computer math sciences	58.7	67.9	68.6	64.5	60.6	44.0	35.5	26.7	34.2
Computer sciences	73.4	74.5	76.1	73.7	74.5	61.3	53.9	NA	NA
Mathematical sciences	41.3	56.1	50.0	39.3	45.6	36.0	32.7	26.1	33.2
Physical sciences	46.4	58.6	55.6	41.1	45.4	39.7	36.9	41.6	42.7
Chemistry	50.4	65.3	65.5	42.3	54.9	36.1	40.7	46.5	40.6
Geosciences	45.0	55.5	47.1	35.8	45.2	45.7	33.1	58.7	48.2
Physics/astronomy	39.4	52.3	45.6	36.2	28.0	34.0	32.9	34.9	43.8
Other physical sciences	48.4	49.8	57.2	63.9	40.0	NA	NA	NA	NA
Social sciences	33.2	36.0	34.7	35.9	32.2	29.7	30.8	31.0	23.5
Economics	28.1	33.2	28.0	26.2	25.7	28.6	23.7	32.8	20.7
Political sciences	20.7	25.8	20.8	18.9	21.4	15.4	16.8	16.9	16.4
Psychology	41.8	43.4	43.7	49.5	39.4	35.0	37.4	56.2	26.8
Sociology/anthropology	30.9	31.0	37.4	30.1	28.7	31.8	32.8	25.3	18.1
Other social sciences	35.4	37.7	37.8	35.5	34.4	30.9	37.0	24.1	42.0
Bachelor's									
All science & engineering	38.7	41.1	45.1	42.7	38.0	31.1	32.2	34.4	35.0
Engineering	51.4	52.8	52.0	54.5	56.2	47.9	46.3	45.3	47.5
Aerospace engineering	38.6	36.8	36.9	48.4	37.1	NA	NA	NA	NA
Chemical engineering	43.7	46.8	51.5	41.6	36.5	26.2	54.8	35.3	53.9
Civil engineering	66.0	67.5	69.8	72.7	61.4	66.2	63.5	58.4	63.1
Electrical engineering	53.0	52.8	52.3	55.9	62.6	48.2	44.3	48.8	51.8
Industrial engineering	33.4	36.3	26.6	30.7	52.9	NA	NA	NA	NA
Mechanical engineering	49.9	50.6	52.6	52.8	63.9	44.2	44.7	39.0	40.6
Other engineering	46.7	53.8	47.8	53.0	45.8	43.9	38.3	39.7	41.1
Life sciences	40.2	44.6	54.6	41.3	37.3	31.3	34.0	39.3	31.2
Agriculture	43.1	51.2	51.1	33.1	48.4	41.9	33.4	NA	21.4
Biological sciences	39.7	43.9	54.7	43.9	34.9	29.7	33.4	32.2	35.3
Health/medical	37.6	40.1	NA	47.3	26.5	24.2	NA	NA	NA
Computer math sciences	55.4	64.7	66.7	61.7	58.0	38.8	30.8	23.2	30.1
Computer sciences	72.5	71.9	75.4	72.8	73.5	62.3	NA	NA	NA
Mathematical sciences	35.9	52.9	46.1	29.7	41.0	29.1	27.9	22.3	29.1
Physical sciences	40.4	53.2	51.8	34.4	39.4	31.4	28.6	36.7	38.2
Chemistry	46.7	62.4	68.5	37.6	51.1	28.1	34.3	43.1	34.5
Geosciences	35.5	46.6	30.6	29.7	37.7	33.3	NA	NA	NA
Physics/astronomy	29.2	42.0	40.5	19.7	18.9	16.4	23.0	NA	NA
Other physical sciences	43.4	46.5	NA	NA	NA	NA	NA	NA	NA
Social sciences	25.0	29.1	26.6	23.5	21.6	22.4	24.0	25.0	19.3
Economics	22.1	27.5	24.3	19.9	15.9	21.1	17.3	26.8	18.7
Political sciences	16.9	22.0	17.6	14.4	15.7	11.9	13.0	16.0	12.7
Psychology	28.2	33.7	29.6	31.5	22.4	22.1	20.4	NA	15.9
Sociology/anthropology	27.9	27.0	34.0	23.6	26.6	28.9	31.5	24.6	NA
Other social sciences	29.3	32.1	32.5	25.2	24.8	25.1	34.1	20.8	NA

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-3
Employed U.S. scientists and engineers, with job closely related to field of highest degree, by degree level, field of highest degree, and years since degree: 1997
(Percent)

Field of highest degree	Employed S&Es, total	Years since degree							
		1–5 years	6–10 years	11–15 years	16–20 years	21–25 years	26–30 years	31–35 years	36+ years
Master's									
All science & engineering	58.5	65.9	63.0	61.3	57.6	52.2	46.6	49.6	40.8
Engineering	57.5	63.5	58.3	59.1	58.0	51.3	51.1	50.5	48.1
Aerospace engineering	46.5	59.4	61.7	NA	NA	NA	NA	NA	NA
Chemical engineering	53.0	58.7	52.7	61.4	NA	NA	NA	NA	NA
Civil engineering	68.3	73.4	68.7	67.6	70.6	63.4	61.7	NA	NA
Electrical engineering	61.1	68.3	61.8	65.5	67.3	40.5	51.7	42.6	NA
Industrial engineering	46.0	51.0	45.5	NA	NA	NA	NA	NA	NA
Mechanical engineering	51.1	56.2	53.0	53.3	45.9	40.3	49.1	NA	NA
Other engineering	54.2	60.4	53.3	54.9	43.3	59.6	49.5	NA	NA
Life sciences	59.4	67.7	70.2	60.4	53.0	57.2	40.9	65.4	NA
Agriculture	59.3	78.0	65.4	NA	NA	NA	NA	NA	NA
Biological sciences	58.3	65.3	72.9	59.8	50.1	57.6	39.3	NA	NA
Health/medical	67.3	66.1	NA	NA	NA	NA	NA	NA	NA
Computer math sciences	66.5	75.3	73.3	74.2	65.1	54.3	42.2	NA	NA
Computer sciences	75.6	80.2	78.0	76.4	77.0	58.9	NA	NA	NA
Mathematical sciences	52.4	62.4	57.8	67.4	50.9	51.0	39.3	NA	NA
Physical sciences	52.7	68.0	59.9	46.1	51.0	53.7	40.3	36.0	39.0
Chemistry	54.5	71.4	61.7	37.0	NA	52.1	NA	NA	NA
Geosciences	58.0	68.0	68.5	44.7	56.9	NA	NA	NA	NA
Physics/astronomy	41.5	66.3	41.0	NA	NA	48.4	NA	NA	NA
Other physical sciences	64.7	NA	NA	NA	NA	NA	NA	NA	NA
Social sciences	56.5	62.2	58.5	60.1	57.3	50.0	49.2	51.4	33.8
Economics	47.9	58.4	NA	NA	NA	NA	NA	NA	NA
Political sciences	34.8	46.6	37.3	NA	40.5	23.2	NA	NA	NA
Psychology	65.9	69.7	69.1	67.9	63.9	57.4	67.4	NA	NA
Sociology/anthropology	46.2	59.8	NA	NA	NA	NA	NA	NA	NA
Other social sciences	51.7	56.2	48.0	NA	54.9	NA	NA	NA	NA
Doctorate									
All science & engineering	70.2	74.1	73.1	71.7	68.9	64.4	65.0	67.6	75.9
Engineering	64.8	66.0	66.6	66.6	67.5	59.6	60.6	62.3	73.5
Aerospace engineering	67.4	73.5	73.6	NA	NA	NA	NA	NA	NA
Chemical engineering	56.4	61.3	54.8	57.2	53.4	50.1	54.5	NA	NA
Civil engineering	70.5	71.4	63.8	75.6	NA	72.0	NA	NA	NA
Electrical engineering	65.6	63.8	71.4	65.9	79.3	61.5	54.0	NA	NA
Industrial engineering	66.1	71.8	61.1	NA	NA	NA	NA	NA	NA
Mechanical engineering	65.6	65.2	66.9	61.9	NA	69.5	NA	NA	NA
Other engineering	65.2	66.7	68.1	67.8	63.9	56.1	64.5	NA	NA
Life sciences	73.8	76.9	75.6	74.6	70.7	70.0	72.1	71.0	78.8
Agriculture	73.6	77.0	74.7	73.7	74.9	72.7	71.8	66.6	NA
Biological sciences	73.9	77.2	75.6	74.5	70.4	70.4	71.7	71.4	80.3
Health/medical	70.8	64.3	78.8	80.3	NA	54.6	NA	NA	NA
Computer math sciences	70.4	71.4	75.1	78.2	69.9	59.8	63.9	69.0	NA
Computer sciences	75.4	70.7	76.0	86.9	NA	NA	NA	NA	NA
Mathematical sciences	68.6	72.1	74.4	74.2	69.4	58.0	63.9	69.0	NA
Physical sciences	59.5	67.3	62.4	59.7	58.4	50.4	52.2	61.4	69.1
Chemistry	58.7	69.8	58.9	57.3	60.7	48.8	50.2	55.4	68.8
Geosciences	74.7	78.6	74.1	71.8	72.5	73.0	73.7	77.8	NA
Physics/astronomy	54.6	59.6	61.0	58.6	47.9	42.6	49.2	63.6	66.3
Other physical sciences	67.0	NA	NA	NA	NA	NA	NA	NA	NA
Social sciences	78.1	82.1	82.4	77.1	74.3	72.9	77.3	77.1	82.6
Economics	81.4	84.3	85.7	85.4	80.6	74.7	78.4	NA	NA
Political sciences	72.8	75.5	79.9	75.5	67.4	62.8	78.6	NA	NA
Psychology	81.6	86.2	87.1	79.4	78.8	75.1	78.7	79.4	83.4
Sociology/anthropology	70.7	75.1	70.8	64.0	65.7	74.4	75.1	NA	NA
Other social sciences	70.3	72.5	70.7	72.7	62.8	66.9	70.4	NA	NA

NA = data not available

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See figure 3-1 and figure 3-2 in Volume 1.

Appendix table 3-4
Employed U.S. scientists and engineers with job closely or somewhat related to field of highest degree, by degree level, field of highest degree, and years since degree: 1997
(Percent)

Field of highest degree	Employed S&Es, total	Years since degree							
		1–5 years	6–10 years	11–15 years	16–20 years	21–25 years	26–30 years	31–35 years	36+ years
All degree levels									
All science & engineering	74.8	76.0	80.2	78.3	74.0	69.1	71.3	71.6	69.4
Engineering	87.7	90.9	89.3	89.6	87.8	85.0	86.7	86.2	76.8
Aerospace engineering	78.6	78.7	80.4	78.0	81.6	76.8	77.9	NA	NA
Chemical engineering	87.0	87.8	92.4	89.6	82.8	85.2	89.3	80.0	82.4
Civil engineering	90.5	93.2	91.9	91.7	88.9	85.3	91.8	94.3	87.7
Electrical engineering	90.6	93.3	91.4	91.5	91.0	89.2	88.7	82.7	87.3
Industrial engineering	81.8	87.5	83.4	79.3	88.3	79.1	75.7	NA	70.3
Mechanical engineering	87.0	89.9	89.5	91.3	90.0	84.3	86.3	87.3	67.8
Other engineering	84.5	90.5	85.9	88.3	83.1	81.8	81.8	86.5	69.3
Life sciences	72.4	75.3	83.1	73.0	70.3	66.2	67.7	70.6	63.7
Agriculture	73.3	78.3	84.9	65.8	73.0	74.4	64.0	85.0	60.3
Biological sciences	72.8	75.2	82.6	75.7	71.4	65.1	69.3	66.7	64.9
Health/medical	66.9	72.0	84.6	70.1	54.9	60.5	56.7	NA	NA
Computer math sciences	86.2	90.4	88.9	88.7	91.4	80.1	75.0	68.7	75.0
Computer sciences	92.6	94.6	91.7	92.6	94.3	89.2	82.8	NA	NA
Mathematical sciences	78.6	83.0	82.0	77.8	88.3	76.0	73.8	68.7	74.4
Physical sciences	76.8	82.8	85.6	73.3	78.7	72.4	73.1	71.8	66.4
Chemistry	79.7	87.7	92.4	78.8	84.3	69.0	75.4	70.4	68.8
Geosciences	70.2	77.3	72.1	64.1	72.0	74.4	65.3	72.7	56.3
Physics/astronomy	77.6	81.4	85.5	71.2	78.5	72.6	75.2	78.3	73.1
Other physical sciences	77.6	75.8	87.6	88.4	76.3	NA	NA	NA	NA
Social sciences	63.3	64.4	66.9	67.0	61.6	59.5	60.7	57.7	62.2
Economics	69.3	73.0	71.9	70.7	62.3	69.8	69.3	53.7	74.2
Political sciences	51.1	52.6	51.7	51.0	53.4	41.0	52.1	57.4	60.7
Psychology	69.9	70.5	73.7	77.3	67.6	64.2	63.3	73.0	61.0
Sociology/anthropology	58.8	59.6	69.0	58.1	58.5	57.5	57.6	53.6	44.8
Other social sciences	62.0	62.4	64.2	63.3	55.2	65.7	63.3	50.9	66.4
Bachelor's									
All science & engineering	70.0	70.4	75.9	74.0	69.0	63.9	66.5	67.1	66.8
Engineering	86.5	89.3	88.1	89.1	86.9	84.8	85.5	84.4	76.2
Aerospace engineering	76.4	72.8	76.8	75.4	79.3	NA	NA	NA	NA
Chemical engineering	84.9	85.2	92.0	87.6	80.7	79.7	88.5	75.8	82.0
Civil engineering	90.3	92.5	90.6	92.7	88.9	87.5	89.7	92.9	88.0
Electrical engineering	89.4	92.2	89.8	89.8	90.0	88.7	88.2	82.3	86.9
Industrial engineering	79.6	83.4	81.1	79.4	85.2	NA	NA	NA	NA
Mechanical engineering	86.4	89.3	89.8	91.6	91.0	82.8	85.4	85.3	67.0
Other engineering	81.5	87.9	83.4	88.6	79.6	76.2	79.7	82.8	69.6
Life sciences	66.2	70.0	78.9	65.4	64.2	60.6	59.9	61.5	58.3
Agriculture	69.4	73.6	82.2	60.5	70.3	72.3	60.2	NA	58.0
Biological sciences	66.1	70.0	78.3	67.7	64.8	58.6	60.4	56.1	56.9
Health/medical	59.3	65.0	NA	63.6	44.1	54.6	NA	NA	NA
Computer math sciences	83.9	88.0	87.6	86.9	89.5	76.7	72.2	64.7	73.8
Computer sciences	91.5	92.9	90.8	91.9	93.1	86.7	NA	NA	NA
Mathematical sciences	75.2	80.0	80.0	72.7	85.4	72.6	70.9	64.3	73.1
Physical sciences	70.3	78.0	81.8	64.7	73.3	63.5	65.1	67.2	59.9
Chemistry	74.1	84.3	92.0	68.2	79.9	60.0	68.5	65.5	63.5
Geosciences	61.1	69.5	57.5	57.8	64.7	64.7	NA	NA	NA
Physics/astronomy	71.1	75.4	84.0	56.4	77.5	56.2	72.0	NA	NA
Other physical sciences	73.7	73.2	NA	NA	NA	NA	NA	NA	NA
Social sciences	57.3	58.8	60.9	58.6	54.3	54.0	56.0	53.5	58.6
Economics	66.0	70.3	69.5	68.4	56.1	66.9	63.9	47.1	72.9
Political sciences	46.8	48.1	48.0	44.7	49.3	36.4	48.2	59.2	54.5
Psychology	60.7	63.4	64.6	68.2	56.2	55.0	51.4	NA	54.3
Sociology/anthropology	56.4	56.0	65.4	53.0	57.2	55.3	57.8	53.7	NA
Other social sciences	56.9	56.5	59.9	52.1	47.0	62.2	63.3	50.6	NA

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-4
Employed U.S. scientists and engineers with job closely or somewhat related to field of highest degree, by degree level, field of highest degree, and years since degree: 1997
(Percent)

Field of highest degree	Employed S&Es, total	Years since degree							
		1–5 years	6–10 years	11–15 years	16–20 years	21–25 years	26–30 years	31–35 years	36+ years
Master's									
All science & engineering	86.6	91.4	90.4	88.2	84.9	80.4	80.3	84.1	79.2
Engineering	90.6	93.6	92.2	90.7	90.4	84.8	89.8	92.3	79.6
Aerospace engineering	82.6	87.0	88.8	NA	NA	NA	NA	NA	NA
Chemical engineering	94.7	96.3	97.0	97.7	NA	NA	NA	NA	NA
Civil engineering	90.2	94.5	96.4	87.8	88.5	76.3	96.0	NA	NA
Electrical engineering	93.8	95.5	94.9	96.7	93.6	90.3	90.3	82.6	NA
Industrial engineering	89.4	95.2	91.1	NA	NA	NA	NA	NA	NA
Mechanical engineering	88.8	91.5	87.5	89.0	84.5	90.6	88.3	NA	NA
Other engineering	88.0	91.6	88.1	86.1	88.6	87.8	83.6	NA	NA
Life sciences	85.5	88.7	89.0	86.2	84.6	77.1	83.9	92.3	NA
Agriculture	86.2	93.3	87.9	NA	NA	NA	NA	NA	NA
Biological sciences	84.3	86.1	87.4	87.5	84.7	74.3	86.5	NA	NA
Health/medical	92.4	95.2	NA	NA	NA	NA	NA	NA	NA
Computer math sciences	91.8	96.1	91.8	95.3	95.3	87.2	78.6	NA	NA
Computer sciences	95.1	97.9	93.6	95.4	96.5	93.3	NA	NA	NA
Mathematical sciences	86.7	91.3	85.8	94.9	93.9	82.7	77.4	NA	NA
Physical sciences	84.7	89.2	92.2	85.3	84.3	85.6	76.0	71.9	76.7
Chemistry	87.3	93.0	96.9	96.1	NA	83.7	NA	NA	NA
Geosciences	84.9	87.7	92.1	76.5	87.5	NA	NA	NA	NA
Physics/astronomy	79.8	88.0	88.1	NA	NA	83.9	NA	NA	NA
Other physical sciences	91.0	NA	NA	NA	NA	NA	NA	NA	NA
Social sciences	81.2	87.6	87.0	84.2	77.7	74.4	72.7	69.8	78.6
Economics	81.3	84.7	NA	NA	NA	NA	NA	NA	NA
Political sciences	71.2	80.1	79.2	NA	65.2	53.1	NA	NA	NA
Psychology	86.5	91.4	92.0	86.1	83.8	80.4	84.1	NA	NA
Sociology/anthropology	70.2	87.5	NA	NA	NA	NA	NA	NA	NA
Other social sciences	75.6	84.0	73.0	NA	71.2	NA	NA	NA	NA
Doctorate									
All science & engineering	92.8	95.0	93.7	93.2	92.7	90.2	90.8	90.9	93.3
Engineering	92.0	94.0	91.6	94.9	93.1	88.1	88.8	91.1	93.3
Aerospace engineering	89.9	97.3	95.9	NA	NA	NA	NA	NA	NA
Chemical engineering	89.8	94.5	88.5	94.7	91.0	84.9	84.1	NA	NA
Civil engineering	97.1	96.3	94.4	95.8	NA	97.5	NA	NA	NA
Electrical engineering	93.0	93.1	94.3	95.3	95.7	91.3	89.1	NA	NA
Industrial engineering	83.5	88.0	78.5	NA	NA	NA	NA	NA	NA
Mechanical engineering	92.1	92.3	93.6	97.5	NA	86.3	NA	NA	NA
Other engineering	91.5	95.3	91.0	93.7	91.4	88.1	87.8	NA	NA
Life sciences	93.8	96.4	95.1	93.0	92.4	92.1	92.0	93.7	91.4
Agriculture	93.3	95.1	95.8	96.5	95.0	86.9	90.0	93.2	NA
Biological sciences	93.8	96.5	95.0	92.5	92.0	92.6	92.2	93.8	93.0
Health/medical	94.9	97.5	96.3	94.0	NA	92.7	NA	NA	NA
Computer math sciences	93.5	93.5	96.3	92.2	95.3	89.1	94.3	91.2	NA
Computer sciences	98.0	97.8	98.5	96.1	NA	NA	NA	NA	NA
Mathematical sciences	91.9	89.4	94.5	90.4	94.0	88.6	94.3	91.2	NA
Physical sciences	89.9	92.6	89.9	92.4	90.1	86.0	88.1	86.6	92.7
Chemistry	91.0	94.7	91.5	92.1	92.6	86.7	91.6	83.0	89.8
Geosciences	93.0	95.3	93.3	93.9	89.2	92.0	91.4	95.0	NA
Physics/astronomy	87.0	89.3	85.6	92.7	86.2	82.3	81.6	88.8	96.4
Other physical sciences	89.1	NA	NA	NA	NA	NA	NA	NA	NA
Social sciences	94.5	96.3	95.6	93.5	94.1	92.9	93.8	93.4	95.2
Economics	97.0	97.1	99.4	97.4	96.4	95.3	96.2	NA	NA
Political sciences	93.1	96.2	92.5	89.6	93.6	95.7	90.7	NA	NA
Psychology	95.5	97.4	97.4	94.2	96.2	92.8	92.9	94.6	94.8
Sociology/anthropology	92.6	96.1	92.4	91.4	91.0	91.6	93.7	NA	NA
Other social sciences	89.8	90.0	88.8	90.9	85.2	87.1	97.9	NA	NA

NA = data not available

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

Appendix table 3-5.
U.S. scientists and engineers, by highest degree attained, occupation, and employment status: 1997

Occupation	S&Es, total	Employed			Unemployed/ seeking job	Not in labor force		
		Total	Full-time	Part-time		Total	Retired	Not seeking job
				All degree levels[a]				
All occupations, total[b]	12,512,000	10,585,600	9,476,700	1,109,000	191,900	1,734,600	1,005,100	729,500
S&E occupations, total	3,899,000	3,369,400	3,105,000	264,400	52,900	476,600	334,300	142,300
Scientists, total	2,261,500	1,995,100	1,791,000	204,000	30,000	236,400	126,000	110,500
Computer/math scientists, total	1,129,700	1,039,500	974,400	65,100	14,600	75,700	40,000	35,700
Computer/information scientists	1,003,400	933,200	895,000	38,200	13,200	56,900	28,800	28,200
Mathematical scientists	42,400	34,700	31,900	2,900	600	7,000	4,300	2,700
Postsecondary teachers-computer/math sciences	84,000	71,500	47,500	24,000	800	11,700	6,900	4,800
Life/related scientists, total	387,300	321,800	292,700	29,000	7,400	58,100	26,700	31,400
Agricultural/food scientists	50,500	43,000	40,300	2,700	700	6,700	5,000	1,700
Biological scientists	221,000	181,900	172,000	9,900	5,100	33,900	11,500	22,400
Environmental life scientists	23,400	20,200	18,500	1,700	S	3,200	3,200	S
Postsecondary teachers-life/related sciences	92,400	76,600	61,800	14,800	1,500	14,300	7,000	7,300
Physical/related scientists, total	343,500	284,900	259,500	25,300	4,600	54,100	37,000	17,200
Chemistry, except biochemistry	147,100	119,800	114,400	5,400	2,000	25,300	17,400	7,900
Earth scientists/geologists/oceanographers	82,100	68,600	63,600	5,000	1,200	12,300	8,900	3,400
Physicists/astronomers	38,400	31,500	28,500	3,000	300	6,600	5,600	900
Other physical/related scientists	18,700	16,700	16,200	600	600	1,300	600	800
Postsecondary teachers-physical/related sciences	57,200	48,200	36,800	11,300	400	8,700	4,500	4,200
Social/related scientists, total	401,000	349,000	264,400	84,500	3,500	48,500	22,300	26,200
Economists	50,800	45,100	37,100	8,000	600	5,100	3,000	2,100
Political/related scientists	11,000	9,100	6,900	2,300	200	1,700	400	1,300
Psychologists	205,800	181,700	134,600	47,100	1,500	22,600	8,000	14,600
Sociologists/anthropologists	19,500	15,800	13,100	2,700	200	3,500	1,000	2,500
Other social/related scientists	13,500	11,900	9,200	2,700	300	1,300	300	1,000
Postsecondary teachers-social/related sciences	100,300	85,300	63,600	21,700	600	14,300	9,600	4,700
Engineers, total	1,637,500	1,374,400	1,314,000	60,400	22,900	240,200	208,400	31,800
Aerospace/related engineers	99,400	72,500	70,200	2,400	1,100	25,700	23,600	2,100
Chemical engineers	93,900	76,300	72,300	3,900	1,100	16,400	13,700	2,800
Civil/architectural engineers	245,600	206,800	196,300	10,500	3,200	35,700	30,900	4,800
Electrical/related engineers	430,500	364,800	352,300	12,500	6,300	59,500	52,800	6,700
Industrial engineers	93,800	79,700	78,400	1,300	1,700	12,400	9,300	3,100
Mechanical engineers	319,500	271,100	263,400	7,800	3,400	45,000	40,800	4,200
Other engineers	313,600	269,200	253,900	15,300	5,700	38,700	32,400	6,300
Postsecondary teachers-engineers	41,300	33,900	27,200	6,700	500	6,800	4,900	1,900
Non-S&E occupations, total	8,613,100	7,216,200	6,371,600	844,600	138,900	1,257,900	670,700	587,200
Managers/administrators	2,321,300	2,019,900	1,941,100	78,800	29,100	272,300	212,000	60,300
Health/related	920,300	802,400	676,700	125,700	10,900	107,000	44,500	62,500
Teachers, except S&E postsecondary	985,500	779,100	626,600	152,500	9,000	197,400	123,000	74,400
Sales/marketing	1,085,700	920,300	800,900	119,400	19,900	145,600	69,800	75,800
Other non-S&E occupations	3,300,300	2,694,500	2,326,300	368,100	70,100	535,800	221,500	314,300

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-5.
U.S. scientists and engineers, by highest degree attained, occupation, and employment status: 1997

Occupation	S&Es, total	Employed			Unemployed/ seeking job	Not in labor force		
		Total	Full-time	Part-time		Total	Retired	Not seeking job
				Bachelor's				
All occupations, total	7,456,800	6,193,700	5,545,400	648,300	123,600	1,139,500	604,800	534,700
S&E occupations, total	2,252,100	1,916,800	1,794,800	122,000	31,800	303,500	214,100	89,400
Scientists, total	1,135,500	1,000,200	915,400	84,800	16,700	118,600	52,300	66,300
Computer/math scientists, total	731,900	675,300	639,100	36,200	10,500	46,000	21,000	25,000
Computer/information scientists	698,700	649,900	622,900	27,000	10,300	38,500	17,500	21,000
Mathematical scientists	16,400	11,900	11,400	500	200	4,200	2,700	1,600
Postsecondary teachers-computer/math sciences	16,800	13,500	4,800	8,700	S	3,300	900	2,400
Life/related scientists, total	158,100	125,200	111,400	13,800	3,100	29,900	8,700	21,200
Agricultural/food scientists	25,800	22,200	21,000	1,200	500	3,100	2,100	1,000
Biological scientists	94,300	73,300	69,600	3,600	2,000	19,000	3,600	15,400
Environmental life scientists	16,900	14,600	13,100	1,600	S	2,300	2,300	S
Postsecondary teachers-life/related sciences	21,100	15,000	7,700	7,400	600	5,500	700	4,800
Physical/related scientists, total	163,300	131,700	118,200	13,500	2,400	29,200	18,800	10,400
Chemistry, except biochemistry	88,100	70,600	67,900	2,700	1,000	16,500	10,100	6,300
Earth scientists/geologists/oceanographers	42,100	34,900	31,900	2,900	700	6,500	5,400	1,100
Physicists/astronomers	10,200	7,400	6,400	1,100	S	2,800	2,500	200
Other physical/related scientists	9,000	8,100	7,900	100	600	300	S	300
Postsecondary teachers-physical/related sciences	13,900	10,700	4,000	6,700	S	3,200	700	2,500
Social/related scientists, total	82,200	68,000	46,700	21,300	800	13,500	3,700	9,700
Economists	18,500	15,900	11,900	4,100	500	2,100	1,600	500
Political/related scientists	6,100	5,100	3,600	1,500	S	1,000	S	1,000
Psychologists	32,500	26,200	20,100	6,100	S	6,300	1,000	5,300
Sociologists/anthropologists	9,600	7,000	6,000	1,000	S	2,600	500	2,100
Other social/related scientists	5,500	4,500	3,000	1,600	200	700	100	600
Postsecondary teachers-social/related sciences	10,100	9,300	2,200	7,100	S	800	500	300
Engineers, total	1,116,600	916,600	879,400	37,200	15,100	184,900	161,800	23,000
Aerospace/related engineers	61,200	40,900	39,900	1,000	600	19,700	18,100	1,500
Chemical engineers	61,000	49,300	46,700	2,600	300	11,300	9,400	1,900
Civil/architectural engineers	181,400	150,500	143,100	7,400	2,600	28,400	24,500	3,800
Electrical/related engineers	290,500	239,600	231,700	8,000	4,400	46,500	41,800	4,700
Industrial engineers	70,100	58,700	58,200	600	1,400	10,000	8,000	2,100
Mechanical engineers	238,500	200,300	194,600	5,700	2,000	36,300	32,900	3,400
Other engineers	206,300	171,800	162,500	9,200	3,700	30,800	26,400	4,400
Postsecondary teachers-engineers	7,400	5,400	2,700	2,700	100	1,900	800	1,200
Non-S&E occupations, total	5,204,700	4,276,900	3,750,600	526,300	91,800	836,000	390,700	445,300
Managers/administrators	1,319,600	1,141,100	1,095,300	45,800	14,200	164,300	129,800	34,500
Health/related	350,900	280,400	221,900	58,500	6,800	63,700	16,900	46,800
Teachers, except S&E postsecondary	482,800	380,700	294,200	86,400	4,500	97,500	45,000	52,500
Sales/marketing	848,600	718,800	630,200	88,600	14,400	115,400	55,500	60,000
Other non-S&E occupations	2,202,800	1,755,900	1,508,900	247,000	51,800	395,000	143,600	251,500

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-5.
U.S. scientists and engineers, by highest degree attained, occupation, and employment status: 1997

Occupation	S&Es, total	Employed			Unemployed/ seeking job	Not in labor force		
		Total	Full-time	Part-time		Total	Retired	Not seeking job
				Master's				
All occupations, total	3,311,300	2,819,800	2,503,300	316,500	52,200	439,300	289,600	149,700
S&E occupations, total	1,100,000	967,900	863,800	104,100	14,000	118,200	76,300	41,900
Scientists, total	671,100	592,000	507,400	84,600	7,200	71,900	37,700	34,200
Computer/math scientists, total	328,500	301,600	277,400	24,200	3,100	23,800	14,600	9,200
Computer/information scientists	272,500	254,200	244,600	9,500	2,400	15,900	9,700	6,200
Mathematical scientists	18,100	15,900	14,200	1,700	200	2,000	1,200	800
Postsecondary teachers-computer/math sciences	37,800	31,500	18,600	12,900	500	5,900	3,700	2,200
Life/related scientists, total	83,800	70,300	61,700	8,500	1,200	12,400	5,700	6,600
Agricultural/food scientists	12,300	10,900	10,300	600	100	1,400	900	400
Biological scientists	45,400	37,600	34,800	2,800	800	7,000	2,500	4,500
Environmental life scientists	4,900	4,200	4,100	100	S	700	700	S
Postsecondary teachers-life/related sciences	21,200	17,600	12,600	5,000	300	3,300	1,500	1,800
Physical/related scientists, total	83,300	69,100	61,800	7,300	1,000	13,100	8,200	4,900
Chemistry, except biochemistry	24,600	20,200	18,900	1,300	500	3,900	3,200	600
Earth scientists/geologists/oceanographers	28,000	23,100	21,500	1,600	300	4,600	2,500	2,100
Physicists/astronomers	11,300	9,000	7,800	1,200	100	2,200	1,700	400
Other physical/related scientists	7,800	7,100	6,700	400	S	700	300	400
Postsecondary teachers-physical/related sciences	11,600	9,700	6,900	2,800	100	1,800	500	1,300
Social/related scientists, total	175,600	151,100	106,500	44,600	2,000	22,600	9,200	13,400
Economists	23,200	21,100	17,700	3,400	S	2,100	600	1,500
Political/related scientists	3,700	3,200	2,500	700	100	400	100	300
Psychologists	108,600	95,000	67,100	27,900	1,300	12,300	4,800	7,600
Sociologists/anthropologists	5,600	5,200	4,100	1,100	200	200	S	200
Other social/related scientists	4,100	3,700	2,700	1,000	S	400	S	400
Postsecondary teachers-social/related sciences	30,400	22,900	12,400	10,500	300	7,200	3,700	3,400
Engineers, total	428,900	375,900	356,300	19,500	6,800	46,300	38,500	7,700
Aerospace/related engineers	32,900	27,300	26,000	1,200	400	5,300	4,800	500
Chemical engineers	24,600	19,900	18,900	1,000	600	4,100	3,400	800
Civil/architectural engineers	59,100	51,700	48,800	2,800	600	6,900	6,000	900
Electrical/related engineers	120,200	107,400	103,500	3,900	1,700	11,100	9,400	1,700
Industrial engineers	21,800	19,300	18,700	600	300	2,200	1,300	900
Mechanical engineers	70,800	61,600	59,900	1,700	1,300	7,900	7,100	800
Other engineers	87,100	79,500	74,500	4,900	1,700	5,900	4,300	1,600
Postsecondary teachers-engineers	12,400	9,300	6,000	3,300	400	2,800	2,300	500
Non-S&E occupations, total	2,211,300	1,851,900	1,639,600	212,400	38,100	321,200	213,400	107,800
Managers/administrators	826,600	724,800	698,500	26,300	13,300	88,400	65,700	22,800
Health/related	109,900	92,500	73,400	19,100	1,800	15,600	8,100	7,500
Teachers, except S&E postsecondary	412,700	323,300	268,700	54,600	2,500	86,900	68,200	18,700
Sales/marketing	215,700	183,100	157,800	25,300	5,400	27,200	13,500	13,600
Other non-S&E occupations	646,300	528,200	441,200	87,000	15,100	103,100	57,900	45,100

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-5.
U.S. scientists and engineers, by highest degree attained, occupation, and employment status: 1997

Occupation	S&Es, total	Employed				Not in labor force		
		Total	Full-time	Part-time	Unemployed/ seeking job	Total	Retired	Not seeking job
				Doctorate				
All occupations, total	789,700	696,000	637,400	58,700	9,700	83,900	67,700	16,200
S&E occupations, total	511,900	454,700	418,900	35,800	6,300	50,900	41,300	9,600
Scientists, total	422,700	375,300	342,800	32,400	5,300	42,100	33,500	8,600
Computer/math scientists, total	64,800	59,000	54,500	4,500	1,000	4,900	3,900	1,000
Computer/information scientists	27,900	25,700	24,300	1,400	600	1,700	1,100	600
Mathematical scientists	7,800	6,900	6,300	700	100	700	500	200
Postsecondary teachers-computer/math sciences	29,100	26,300	23,900	2,400	300	2,500	2,300	200
Life/related scientists, total	128,400	111,800	105,500	6,300	2,400	14,200	10,900	3,200
Agricultural/food scientists	12,200	9,800	8,900	900	200	2,200	1,900	300
Biological scientists	73,400	64,100	60,900	3,200	2,000	7,300	4,900	2,400
Environmental life scientists	1,500	1,200	1,200	S	S	300	300	S
Postsecondary teachers-life/related sciences	41,300	36,700	34,600	2,100	200	4,400	3,900	500
Physical/related scientists, total	96,100	83,700	79,200	4,500	1,200	11,200	9,500	1,700
Chemistry, except biochemistry	34,400	28,900	27,500	1,400	600	5,000	4,000	900
Earth scientists/geologists/oceanographers	11,900	10,500	10,000	500	200	1,200	1,000	200
Physicists/astronomers	16,900	15,100	14,300	800	100	1,600	1,300	300
Other physical/related scientists	1,700	1,400	1,400	S	S	300	300	S
Postsecondary teachers-physical/related sciences	31,200	27,800	25,900	1,800	300	3,100	2,800	300
Social/related scientists, total	133,300	120,800	103,600	17,200	800	11,800	9,200	2,600
Economists	8,700	7,800	7,300	600	100	800	700	100
Political/related scientists	1,200	900	800	100	100	300	300	S
Psychologists	58,000	54,300	42,400	11,800	200	3,500	2,100	1,400
Sociologists/anthropologists	4,300	3,600	3,000	600	S	700	500	200
Other social/related scientists	3,000	2,700	2,600	100	S	300	200	100
Postsecondary teachers-social/related sciences	58,100	51,600	47,600	4,000	300	6,200	5,400	800
Engineers, total	89,200	79,400	76,100	3,300	1,000	8,800	7,800	900
Aerospace/related engineers	5,100	4,300	4,200	100	100	700	600	100
Chemical engineers	8,300	7,100	6,700	300	300	1,000	900	100
Civil/architectural engineers	4,500	4,000	3,700	300	S	400	400	100
Electrical/related engineers	18,800	16,800	16,400	400	200	1,800	1,600	200
Industrial engineers	1,400	1,400	1,300	100	S	S	S	S
Mechanical engineers	9,900	9,000	8,700	300	100	800	800	S
Other engineers	19,900	17,700	16,600	1,100	300	2,000	1,800	200
Postsecondary teachers-engineers	21,300	19,200	18,500	700	100	2,000	1,900	200
Non-S&E occupations, total	277,800	241,300	218,400	22,900	3,400	33,100	26,400	6,700
Managers/administrators	115,300	102,400	98,300	4,100	1,200	11,700	10,600	1,100
Health/related	26,400	21,800	18,900	2,900	400	4,100	3,100	1,000
Teachers, except S&E postsecondary	68,100	57,900	51,800	6,100	700	9,500	8,000	1,400
Sales/marketing	9,600	8,300	6,500	1,800	100	1,200	700	500
Other non-S&E occupations	58,500	51,000	43,000	8,000	1,000	6,500	3,900	2,600

S = suppressed for reasons of confidentiality and/or data reliability

[a] Includes professional degrees.

[b] Total excludes 18,700 individuals who reported never having worked. For unemployed individuals, occupation is for their previous reported job.

NOTES: The term "Scientists and Engineers" (S&Es) includes all persons who have ever received a bachelor's degree or higher in a science or engineering (S&E) field, plus persons holding a non-S&E bachelor's or higher degree who were employed in a S&E occupation during either the 1993, 1995 or 1997 SESTAT surveys. Figures are rounded to nearest hundred. Details may not add to total because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See figure 3-4 in Volume 1.

Appendix table 3-6.
Employed U.S. scientists and engineers, by highest degree attained, occupation, and employment sector: 1997

Occupation	Employed S&Es, total	Business/industry				Educational institution			Government		
		Total	Profit	Self-employed	Non-profit	Total	4-year college/university	Other	Total	Federal	State/local
					All degree levels[a]						
All occupations, total	10,585,600	7,264,900	5,910,800	728,100	625,900	1,953,500	940,600	1,012,900	1,367,300	575,100	792,100
S&E occupations, total	3,369,400	2,343,600	2,126,400	110,100	107,000	586,700	475,700	111,000	439,100	250,600	188,600
Scientists, total	1,995,100	1,236,900	1,066,000	81,000	89,800	512,700	409,100	103,600	245,500	139,600	105,900
Computer/math scientists, total	1,039,500	828,900	771,800	25,100	32,000	121,200	88,200	33,000	89,400	53,300	36,100
Computer/information scientists	933,200	811,400	757,400	24,600	29,400	45,400	35,600	9,800	76,400	44,100	32,300
Mathematical scientists	34,700	16,700	13,900	500	2,300	5,000	4,700	300	13,000	9,200	3,800
Postsecondary teachers-computer/math scientists	71,500	800	500	S	200	70,700	47,900	22,800	S	S	S
Life/related scientists, total	321,800	102,700	81,400	8,000	13,300	154,500	139,100	15,400	64,600	37,900	26,700
Agricultural/food scientists	43,000	24,600	21,100	3,000	500	9,500	9,400	100	9,000	5,200	3,800
Biological scientists	181,900	70,800	57,200	2,900	10,800	69,800	68,600	1,200	41,300	22,500	18,800
Environmental life scientists	20,200	5,800	2,600	2,000	1,200	400	400	S	14,000	10,100	3,800
Postsecondary teachers-life/related scientists	76,600	1,500	500	200	800	74,800	60,600	14,200	300	100	300
Physical/related scientists, total	284,900	156,100	144,800	6,200	5,100	80,000	71,100	8,900	48,700	30,500	18,200
Chemistry, except biochemistry	119,800	94,300	90,300	1,800	2,200	10,500	10,400	100	15,000	6,400	8,700
Earth scientists/geologists/oceanographers	68,600	42,200	37,600	3,800	800	9,100	8,700	400	17,400	12,400	5,000
Physicists/astronomers	31,500	12,800	10,700	400	1,700	11,100	11,000	100	7,600	6,800	800
Other physical/related scientists	16,700	6,700	6,100	200	400	1,400	1,100	300	8,600	4,900	3,700
Postsecondary teachers-physical/related scientists	48,200	100	100	S	S	48,000	40,000	8,000	100	100	S
Social/related scientists, total	349,000	149,200	68,000	41,700	39,400	157,000	110,600	46,400	42,800	17,900	24,900
Economists	45,100	28,400	23,100	2,900	2,400	4,300	4,200	S	12,400	8,900	3,500
Political/related scientists	9,100	3,800	1,700	600	1,600	1,500	1,500	S	3,800	2,100	1,700
Psychologists	181,700	105,400	36,900	37,400	31,100	55,800	21,200	34,600	20,500	4,300	16,300
Sociologists/anthropologists	15,800	5,600	3,700	700	1,200	6,600	6,100	400	3,700	1,500	2,200
Other social/related scientists	11,900	5,600	2,500	200	3,000	4,300	3,900	400	1,900	700	1,200
Postsecondary teachers-social/related scientists	85,300	300	100	S	200	84,500	73,700	10,800	500	500	S
Engineers, total	1,374,400	1,106,700	1,060,400	29,100	17,200	74,000	66,700	7,400	193,600	110,900	82,700
Aerospace/related engineers	72,500	55,600	53,700	800	1,100	3,100	3,000	100	13,800	13,800	100
Chemical engineers	76,300	71,200	69,300	1,600	300	2,700	2,700	S	2,400	1,700	700
Civil/architectural engineers	206,800	132,100	123,500	7,300	1,300	4,200	3,100	1,100	70,500	15,800	54,700
Electrical/related engineers	364,800	308,400	295,200	6,800	6,500	13,300	12,500	900	43,000	36,500	6,600
Industrial engineers	79,700	73,900	71,000	900	2,000	1,600	1,400	200	4,200	3,400	700
Mechanical engineers	271,100	246,500	239,300	5,500	1,600	6,200	6,200	100	18,400	15,400	3,000
Other engineers	269,200	218,800	208,400	6,100	4,300	9,300	8,900	400	41,100	24,300	16,900
Postsecondary teachers-engineers	33,900	100	100	S	S	33,600	28,900	4,700	200	200	S

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-6.
Employed U.S. scientists and engineers, by highest degree attained, occupation, and employment sector: 1997

Occupation	Employed S&Es, total	Business/industry				Educational institution			Government		
		Total	Profit	Self-employed	Non-profit	Total	4-year college/university	Other	Total	Federal	State/local
Non-S&E occupations, total	7,216,200	4,921,300	3,784,400	618,000	518,900	1,366,800	464,800	901,900	928,100	324,600	603,600
Managers/administrators	2,019,900	1,527,000	1,318,800	70,000	138,300	190,000	90,300	99,700	303,000	122,700	180,200
Health/related	802,400	576,900	355,900	98,400	122,700	158,800	148,200	10,600	66,700	24,800	41,900
Teachers, except S&E postsecondary	779,100	38,900	20,200	8,900	9,800	728,100	95,700	632,400	12,200	2,000	10,200
Sales/marketing	920,300	903,000	768,700	115,900	18,400	6,400	3,800	2,600	10,900	2,700	8,200
Other non-S&E occupations	2,694,500	1,875,600	1,320,900	324,900	229,800	283,600	127,000	156,600	535,300	172,200	363,100
Bachelor's											
All occupations, total	6,193,700	4,582,200	3,903,100	360,500	318,600	780,800	317,600	463,200	830,700	337,900	492,900
S&E occupations, total	1,916,800	1,497,700	1,402,900	47,300	47,500	155,800	130,700	25,100	263,300	141,000	122,300
Scientists, total	1,000,200	740,100	672,100	29,500	38,500	131,200	110,200	21,100	128,900	69,200	59,700
Computer/math scientists, total	675,300	571,700	531,500	18,600	21,600	41,700	31,100	10,600	61,900	35,500	26,400
Computer/information scientists	649,900	566,700	526,800	18,600	21,400	27,500	22,100	5,400	55,700	30,400	25,300
Mathematical scientists	11,900	4,500	4,500	S	S	1,200	1,200	S	6,200	5,000	1,200
Postsecondary teachers-computer/math scientists	13,500	400	300	S	200	13,100	7,900	5,200	S	S	S
Life/related scientists, total	125,200	49,300	40,400	4,700	4,200	41,200	36,600	4,600	34,700	18,500	16,200
Agricultural/food scientists	22,200	14,500	12,500	1,800	200	3,100	3,100	S	4,600	2,600	2,000
Biological scientists	73,300	30,200	26,200	1,000	3,000	23,700	23,400	300	19,400	8,200	11,200
Environmental life scientists	14,600	4,000	1,100	1,800	1,100	S	S	S	10,600	7,700	2,900
Postsecondary teachers-life/related scientists	15,000	500	500	S	S	14,300	10,000	4,300	200	S	200
Physical/related scientists, total	131,700	87,300	81,800	3,600	1,900	21,900	20,600	1,300	22,400	11,100	11,300
Chemistry, except biochemistry	70,600	56,500	54,700	800	1,100	5,300	5,300	S	8,800	2,900	5,900
Earth scientists/geologists/oceanographers	34,900	24,100	21,100	2,800	200	2,700	2,700	S	8,000	5,500	2,500
Physicists/astronomers	7,400	3,000	2,700	S	300	3,100	3,100	S	1,300	900	400
Other physical/related scientists	8,100	3,600	3,300	S	300	200	200	S	4,300	1,800	2,500
Postsecondary teachers-physical/related scientists	10,700	100	100	S	S	10,600	9,300	1,300	S	S	S
Social/related scientists, total	68,000	31,800	18,400	2,700	10,700	26,400	21,700	4,600	9,900	4,100	5,800
Economists	15,900	9,700	7,500	1,500	700	1,700	1,700	S	4,500	2,700	1,800
Political/related scientists	5,100	1,900	800	S	1,000	900	900	S	2,300	700	1,700
Psychologists	26,200	15,200	6,900	1,100	7,200	9,800	7,400	2,400	1,200	300	900
Sociologists/anthropologists	7,000	3,000	2,200	100	700	2,800	2,600	200	1,200	300	900
Other social/related scientists	4,500	2,000	1,100	S	1,000	1,900	1,700	100	600	200	500
Postsecondary teachers-social/related scientists	9,300	S	S	S	S	9,300	7,400	1,900	S	S	S

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-6.
Employed U.S. scientists and engineers, by highest degree attained, occupation, and employment sector: 1997

Occupation	Employed S&Es, total	Business/industry				Educational institution			Government		
		Total	Profit	Self-employed	Non-profit	Total	4-year college/university	Other	Total	Federal	State/local
Engineers, total	916,600	757,700	730,800	17,800	9,100	24,600	20,600	4,000	134,400	71,800	62,600
Aerospace/related engineers	40,900	32,300	31,700	300	300	1,400	1,400	S	7,200	7,200	S
Chemical engineers	49,300	46,200	45,500	700	S	1,600	1,600	S	1,600	900	700
Civil/architectural engineers	150,500	92,200	86,800	4,600	900	2,800	1,800	1,000	55,500	11,600	43,900
Electrical/related engineers	239,600	204,800	197,700	3,900	3,200	5,500	4,800	800	29,300	24,500	4,800
Industrial engineers	58,700	54,300	52,500	700	1,000	1,000	800	200	3,400	2,700	700
Mechanical engineers	200,300	183,900	178,800	4,200	900	3,200	3,200	S	13,100	10,700	2,500
Other engineers	171,800	143,900	137,800	3,400	2,700	3,800	3,500	400	24,100	14,000	10,000
Postsecondary teachers-engineers	5,400	S	S	S	S	5,300	3,600	1,700	200	200	S
Non-S&E occupations, total	4,276,900	3,084,500	2,500,100	313,200	271,100	625,000	186,900	438,100	567,500	196,900	370,600
Managers/administrators	1,141,100	928,600	827,300	38,100	63,200	55,200	33,400	21,800	157,300	64,500	92,800
Health/related	280,400	192,700	118,300	10,200	64,200	56,700	52,400	4,300	31,100	7,100	23,900
Teachers, except S&E postsecondary	380,700	27,100	14,500	7,400	5,200	347,900	13,900	334,100	5,700	1,400	4,300
Sales/marketing	718,800	703,700	603,800	86,200	13,700	5,600	3,300	2,300	9,500	2,300	7,200
Other non-S&E occupations	1,755,900	1,232,400	936,300	171,300	124,800	159,500	83,900	75,700	364,000	121,600	242,400
Master's											
All occupations, total	2,819,800	1,736,000	1,370,600	150,200	215,200	711,400	219,300	492,100	372,500	157,000	215,500
S&E occupations, total	967,900	657,200	580,800	39,100	37,300	182,500	113,300	69,200	128,200	74,600	53,600
Scientists, total	592,000	357,100	296,400	29,400	31,400	158,800	92,700	66,100	76,100	41,500	34,600
Computer/math scientists, total	301,600	228,400	214,300	5,600	8,500	49,500	29,500	20,000	23,700	15,200	8,500
Computer/information scientists	254,200	219,700	207,300	5,200	7,100	15,700	11,800	3,900	18,800	12,400	6,400
Mathematical scientists	15,900	8,700	6,900	300	1,400	2,300	2,000	300	4,900	2,800	2,100
Postsecondary teachers-computer/math scientists	31,500	100	100	S	S	31,400	15,700	15,800	S	S	S
Life/related scientists, total	70,300	22,500	18,000	1,500	3,000	31,100	23,500	7,600	16,600	8,400	8,200
Agricultural/food scientists	10,900	5,700	4,900	700	S	2,900	2,900	100	2,200	800	1,500
Biological scientists	37,600	14,600	11,800	500	2,300	11,200	11,200	S	11,700	5,800	5,900
Environmental life scientists	4,200	1,400	1,300	100	100	100	100	S	2,600	1,800	800
Postsecondary teachers-life/related scientists	17,600	800	S	200	600	16,800	9,300	7,500	S	S	S
Physical/related scientists, total	69,100	35,600	33,300	1,200	1,100	18,400	13,200	5,200	15,200	9,600	5,600
Chemistry, except biochemistry	20,200	14,700	14,100	300	300	1,700	1,700	S	3,800	1,500	2,300
Earth scientists/geologists/oceanographers	23,100	14,600	13,800	700	100	2,600	2,500	100	5,900	3,900	2,000
Physicists/astronomers	9,000	4,000	3,300	100	600	3,300	3,300	100	1,600	1,600	S
Other physical/related scientists	7,100	2,200	2,000	100	100	1,100	800	300	3,800	2,600	1,200
Postsecondary teachers-physical/related scientists	9,700	S	S	S	S	9,700	4,900	4,700	100	100	S

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-6.
Employed U.S. scientists and engineers, by highest degree attained, occupation, and employment sector: 1997

Occupation	Employed S&Es, total	Business/industry				Educational institution			Government		
		Total	Profit	Self-employed	Non-profit	Total	4-year college/university	Other	Total	Federal	State/local
Social/related scientists, total	151,100	70,700	30,800	21,100	18,800	59,800	26,500	33,300	20,600	8,300	12,300
Economists	21,100	13,700	11,500	1,000	1,300	1,300	1,300	S	6,100	4,700	1,400
Political/related scientists	3,200	1,600	800	500	300	300	300	S	1,200	1,100	100
Psychologists	95,000	51,700	16,800	19,100	15,800	32,800	5,700	27,100	10,500	1,100	9,300
Sociologists/anthropologists	5,200	1,300	1,000	400	S	2,200	2,000	100	1,700	700	1,000
Other social/related scientists	3,700	2,000	700	100	1,300	1,000	900	S	700	200	500
Postsecondary teachers-social/related scientists	22,900	200	100	S	100	22,300	16,200	6,100	500	500	S
Engineers, total	375,900	300,100	284,400	9,700	5,900	23,700	20,600	3,100	52,100	33,000	19,000
Aerospace/related engineers	27,300	20,300	19,400	400	600	1,200	1,100	100	5,800	5,700	100
Chemical engineers	19,900	18,800	17,900	700	100	600	600	S	600	500	S
Civil/architectural engineers	51,700	36,700	33,700	2,600	400	1,000	900	100	14,100	3,800	10,200
Electrical/related engineers	107,400	89,300	84,200	2,700	2,500	6,400	6,400	100	11,600	10,000	1,700
Industrial engineers	19,300	18,100	17,100	200	800	600	600	S	700	700	S
Mechanical engineers	61,600	55,200	53,600	1,100	500	2,000	1,900	100	4,400	3,900	500
Other engineers	79,500	61,800	58,600	2,100	1,100	2,700	2,700	S	15,000	8,500	6,500
Postsecondary teachers-engineers	9,300	S	S	S	S	9,300	6,500	2,800	S	S	S
Non-S&E occupations, total	1,851,900	1,078,700	789,700	111,100	177,900	528,900	106,000	422,900	244,300	82,400	161,900
Managers/administrators	724,800	506,500	420,900	24,900	60,700	93,700	30,100	63,600	124,600	48,600	76,000
Health/related	92,500	63,300	36,000	5,500	21,800	17,200	13,300	3,900	12,000	4,000	8,000
Teachers, except S&E postsecondary	323,300	10,800	4,900	1,300	4,500	307,500	27,000	280,500	5,000	500	4,500
Sales/marketing	183,100	181,100	151,700	24,800	4,600	700	400	300	1,400	400	1,000
Other non-S&E occupations	528,200	317,100	176,200	54,600	86,300	109,900	35,200	74,700	101,200	28,900	72,400
Doctorate											
All occupations, total	696,000	289,100	212,500	38,300	38,300	341,800	302,000	39,800	65,100	42,500	22,600
S&E occupations, total	454,700	174,500	134,600	21,200	18,700	235,600	220,900	14,700	44,600	32,800	11,800
Scientists, total	375,300	127,200	91,200	19,600	16,400	209,900	195,400	14,500	38,100	27,300	10,800
Computer/math scientists, total	59,000	25,600	22,700	1,000	1,800	29,600	27,400	2,200	3,800	2,600	1,200
Computer/information scientists	25,700	21,700	20,000	800	900	2,100	1,700	300	1,900	1,300	600
Mathematical scientists	6,900	3,500	2,500	200	900	1,500	1,500	S	1,900	1,300	600
Postsecondary teachers-computer/math scientists	26,300	300	200	S	100	26,000	24,200	1,800	S	S	S
Life/related scientists, total	111,800	27,200	20,800	1,300	5,000	72,500	69,500	3,000	12,200	9,900	2,200
Agricultural/food scientists	9,800	4,300	3,600	400	300	3,400	3,400	S	2,000	1,700	300
Biological scientists	64,100	22,400	16,900	800	4,700	32,300	31,400	900	9,400	7,600	1,700
Environmental life scientists	1,200	300	200	100	100	300	300	S	600	500	100
Postsecondary teachers-life/related sciences	36,700	100	S	S	100	36,500	34,400	2,100	200	100	100

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-6.
Employed U.S. scientists and engineers, by highest degree attained, occupation, and employment sector: 1997

Occupation	Employed S&Es, total	Business/industry				Educational institution			Government		
		Total	Profit	Self-employed	Non-profit	Total	4-year college/university	Other	Total	Federal	State/local
Physical/related scientists, total	83,700	33,100	29,700	1,300	2,100	39,700	37,300	2,400	10,800	9,500	1,300
Chemistry, except biochemistry	28,900	23,000	21,500	700	800	3,500	3,400	100	2,400	2,000	400
Earth scientists/geologists/oceanographers	10,500	3,500	2,700	300	500	3,700	3,400	300	3,300	2,900	500
Physicists/astronomers	15,100	5,800	4,700	300	800	4,700	4,700	S	4,600	4,200	400
Other physical/related scientists	1,400	800	800	S	S	100	100	S	500	400	S
Postsecondary teachers-physical/related scientists	27,800	S	S	S	S	27,700	25,700	2,000	S	S	S
Social/related scientists, total	120,800	41,400	18,000	16,000	7,400	68,000	61,200	6,800	11,400	5,300	6,100
Economists	7,800	4,700	3,800	400	500	1,200	1,200	S	1,900	1,500	300
Political/related scientists	900	300	100	S	200	300	300	S	300	300	S
Psychologists	54,300	34,400	13,200	15,200	6,000	12,000	7,900	4,100	7,900	2,600	5,200
Sociologists/anthropologists	3,600	1,200	600	200	400	1,600	1,400	100	800	500	200
Other social/related scientists	2,700	600	300	100	300	1,500	1,200	300	600	400	200
Postsecondary teachers-social/related scientists	51,600	100	S	S	100	51,500	49,200	2,300	S	S	S
Engineers, total	79,400	47,200	43,400	1,600	2,200	25,700	25,500	300	6,500	5,500	1,000
Aerospace/related engineers	4,300	3,000	2,700	100	200	500	500	S	800	800	S
Chemical engineers	7,100	6,300	6,000	100	200	500	500	S	200	200	S
Civil/architectural engineers	4,000	2,700	2,500	200	100	500	500	S	800	300	500
Electrical/related engineers	16,800	13,800	12,700	200	800	1,400	1,400	S	1,600	1,600	100
Industrial engineers	1,400	1,300	1,100	S	100	100	100	S	100	100	S
Mechanical engineers	9,000	7,200	6,700	200	200	1,000	1,000	S	800	700	S
Other engineers	17,700	12,900	11,700	600	600	2,700	2,700	S	2,100	1,700	400
Postsecondary teachers-engineers	19,200	100	100	S	S	19,100	18,800	200	S	S	S
Non-S&E occupations, total	241,300	114,700	77,900	17,100	19,700	106,200	81,100	25,100	20,500	9,700	10,800
Managers/administrators	102,400	55,200	43,200	3,000	9,000	34,000	22,700	11,200	13,300	6,500	6,800
Health/related	21,800	12,700	7,800	2,600	2,300	7,500	7,100	400	1,600	1,100	600
Teachers, except S&E postsecondary	57,900	800	500	100	100	56,500	46,400	10,100	700	200	500
Sales/marketing	8,300	8,200	6,700	1,400	100	100	100	S	S	S	S
Other non-S&E occupations	51,000	37,900	19,700	10,000	8,200	8,200	4,900	3,300	4,900	2,000	2,900

S = suppressed for reasons of confidentiality and/or data reliability

[a]Includes professional degrees.

NOTES: The term "Scientists and Engineers" (S&Es) includes all persons who have ever received a bachelor's degree or higher in a science or engineering (S&E) field, plus persons holding a non-S&E bachelor's or higher degree who were employed in a S&E occupation during either the 1993, 1995 or 1997 SESTAT surveys. Figures are rounded to nearest hundred. Details may not add to total because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See text table 3-4 in Volume 1.

Appendix table 3-7.
Median annual salaries of U.S. scientists and engineers, by occupation and highest degree attained: 1997
(Dollars)

Occupation	Employed S&Es, total	Level of highest degree			
		Bachelor's	Master's	Doctorate	Professional
All occupations, total	50,000	45,000	53,000	63,000	90,000
S&E occupations, total	55,000	52,000	59,000	62,000	80,000
Scientists, total	52,000	50,000	54,000	60,000	86,000
Computer/math scientists, total	56,000	54,000	60,000	65,000	67,000
Computer/information scientists	56,000	54,000	62,000	74,900	S
Mathematical scientists	59,800	52,500	60,000	70,000	S
Postsecondary teachers-computer/ math scientists	45,000	27,000	35,000	55,000	S
Life/related scientists, total	44,000	36,000	42,000	57,500	120,000
Agricultural/food scientists	41,000	37,000	40,000	60,000	S
Biological scientists	41,000	35,000	42,000	55,000	120,000
Environmental life scientists	45,000	41,000	52,000	59,000	S
Postsecondary teachers-life/related scientists	52,000	28,000	37,500	58,000	110,000
Physical/related scientists, total	50,000	42,000	51,000	65,000	S
Chemistry, except biochemistry	48,500	41,300	50,000	70,000	S
Earth scientists/geologists/oceanographers	50,000	46,500	53,000	62,000	S
Physicists/astronomers	63,000	42,000	58,000	73,000	S
Other physical/related scientists	45,000	37,500	50,000	77,800	S
Postsecondary teachers-physical/related scientists	50,000	14,500	41,000	55,000	S
Social/related scientists, total	45,000	25,000	41,100	54,000	53,000
Economists	57,000	45,000	62,500	73,000	S
Political/related scientists	32,000	30,000	36,000	75,000	S
Psychologists	40,000	22,000	40,000	55,000	45,000
Sociologists/anthropologists	30,000	20,000	33,500	50,900	S
Other social/related scientists	50,000	S	S	52,400	S
Postsecondary teachers-social/related scientists	49,000	S	38,000	51,600	S
Engineers, total	60,000	55,000	63,600	72,000	S
Aerospace/related engineers	65,000	61,000	68,000	78,500	S
Chemical engineers	65,000	62,000	70,000	72,100	S
Civil/architectural engineers	53,100	51,000	60,000	68,000	S
Electrical/related engineers	61,500	60,000	69,000	79,000	S
Industrial engineers	53,000	52,000	58,000	72,000	S
Mechanical engineers	58,000	55,000	60,000	72,100	S
Other engineers	59,200	55,000	62,000	71,200	S
Postsecondary teachers-engineers	60,000	35,000	48,000	65,000	S
Non-S&E occupations, total	46,000	40,000	50,000	65,000	90,000
Managers/administrators	62,000	56,000	68,000	83,500	74,400
Health/related	57,500	37,000	41,400	75,000	110,000
Teachers, except S&E postsecondary	36,000	29,500	41,000	52,000	52,000
Social service/related	31,000	27,000	37,000	40,000	35,000
Technology/technical	44,000	42,000	52,000	60,000	S
Sales/marketing	45,000	42,000	60,000	70,000	45,000
Art, humanities and related	40,000	36,000	45,000	44,000	S
Other non-S&E occupations	37,000	30,000	39,000	60,000	80,000

S = suppressed for reasons of confidentiality and/or data reliability

NOTES: The term "Scientists and Engineers" (S&Es) includes all people who have ever received a bachelor's degree or higher in an S&E field, plus persons holding a non-S&E bachelor's or higher degree who were employed in an S&E occupation during the 1993, 1995, or 1997 SESTAT surveys. Figures are rounded to nearest hundred. Details may not add to total because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See page 3-8 in Volume 1.

Appendix table 3-8.
Median annual salaries of U.S. scientists and engineers, by highest degree attained, occupation, sex, and years since degree: 1997

Highest degree, occupation and sex	Employed S&Es, total	Years since degree							
		<5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
				All degree levels[a]					
All occupations, total	50,000	33,100	45,000	53,000	58,000	58,000	58,000	62,000	60,000
Male	58,000	42,000	52,000	60,000	64,000	65,000	68,000	70,000	65,000
Female	39,000	29,000	39,000	45,000	45,000	45,000	41,200	43,000	40,000
S&E occupations, total	55,000	40,000	50,000	58,000	62,000	63,000	66,000	67,000	63,000
Male	58,000	42,000	52,000	60,000	64,000	65,000	68,000	70,000	65,000
Female	47,000	35,000	47,000	51,000	52,400	52,000	55,000	50,000	55,000
Scientists, total	52,000	37,400	48,000	55,000	59,000	59,500	62,000	62,000	62,000
Male	55,000	40,000	50,000	59,600	61,000	60,500	63,000	65,000	67,300
Female	45,000	33,100	44,000	50,000	51,000	52,000	55,000	50,000	52,000
Computer/math scientists, total	56,000	46,000	53,000	60,000	60,100	61,000	64,000	63,300	58,000
Male	58,200	47,500	55,000	60,000	62,000	65,000	65,000	65,000	60,000
Female	51,000	42,000	50,000	53,000	55,500	53,000	60,000	57,000	S
Life/related scientists, total	44,000	27,000	38,000	49,000	51,000	53,000	56,700	56,000	67,300
Male	48,500	27,500	40,000	50,000	57,000	55,000	61,000	60,000	69,000
Female	37,000	27,000	36,000	43,700	44,500	50,000	45,000	42,000	S
Physical/related scientists, total	50,000	32,000	43,000	53,000	59,100	60,000	60,000	70,000	68,000
Male	52,000	33,000	44,000	54,000	62,000	63,400	60,000	72,000	73,000
Female	41,000	31,000	40,000	48,000	51,000	52,000	52,200	49,200	S
Social/related scientists, total	45,000	30,000	40,000	50,000	52,000	52,000	60,000	60,000	55,000
Male	50,000	32,000	40,000	55,000	57,500	55,000	60,000	65,000	78,000
Female	38,000	30,000	38,000	46,000	47,500	50,000	55,000	58,600	S
Engineers, total	60,000	44,000	53,300	60,000	65,000	68,000	70,000	71,000	64,000
Male	60,000	45,000	54,000	60,000	65,000	68,600	70,000	71,500	64,500
Female	50,000	42,000	52,000	55,400	60,000	60,000	60,100	S	S
Non-S&E occupations, total	46,000	30,000	40,000	50,000	54,000	55,000	52,000	58,000	57,000
Male	52,500	32,000	45,000	55,000	62,000	60,000	60,000	66,400	60,000
Female	36,000	28,000	36,000	43,000	42,000	42,600	39,900	41,000	40,000
Managers/administrators	62,000	42,000	53,000	60,000	65,900	67,000	72,000	80,000	72,000
Male	69,500	48,000	60,000	63,000	72,000	71,000	77,000	84,200	75,000
Female	50,000	36,600	45,000	50,000	55,000	55,000	51,000	50,000	48,000
Other non-S&E occupations	40,000	28,000	37,700	45,000	46,000	48,000	46,000	50,000	50,000
Male	45,000	30,000	41,000	50,000	52,000	52,000	50,000	54,000	54,000
Female	33,100	26,000	34,000	40,000	39,000	38,000	36,500	39,900	37,700

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-8.
Median annual salaries of U.S. scientists and engineers, by highest degree attained, occupation, sex, and years since degree: 1997

Highest degree, occupation and sex	Employed S&Es, total	Years since degree							
		<5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
				Bachelor's					
All occupations, total	45,000	28,800	40,000	50,000	52,000	50,000	53,000	57,000	55,000
Male	50,000	32,000	44,000	52,000	58,000	55,000	59,000	63,000	60,000
Female	34,000	25,000	33,000	41,500	40,000	39,000	39,000	42,000	40,000
S&E occupations, total	52,000	37,000	48,000	55,000	60,000	60,000	62,400	65,000	60,000
Male	55,000	39,000	49,000	56,000	60,000	61,000	65,000	65,200	60,000
Female	45,000	33,300	45,000	50,000	52,000	50,000	54,000	49,900	56,000
Scientists, total	50,000	34,000	45,000	53,000	55,000	55,000	58,000	56,000	55,000
Male	52,000	36,000	46,000	55,000	58,200	58,000	59,000	60,000	55,000
Female	43,400	29,500	40,800	50,000	48,500	50,000	52,000	49,400	55,000
Computer/math scientists, total	54,000	41,000	50,000	55,000	59,000	59,000	62,000	60,000	57,000
Male	55,000	42,000	50,000	58,000	60,000	60,500	62,000	60,700	55,000
Female	50,000	38,000	48,000	51,800	52,000	50,000	60,000	59,000	S
Life/related scientists, total	36,000	22,000	31,000	40,000	42,000	46,000	43,000	48,500	S
Male	40,000	22,000	30,000	42,000	40,900	44,000	43,000	S	S
Female	32,000	21,000	31,700	35,000	43,000	S	S	S	S
Physical/related scientists, total	42,000	27,300	37,000	44,000	52,000	52,000	54,000	57,000	52,000
Male	45,000	27,800	37,000	45,000	52,000	55,000	55,000	64,000	65,000
Female	37,000	26,000	37,000	42,000	48,000	47,000	S	S	S
Social/related scientists, total	25,000	21,000	25,000	S	S	S	S	S	S
Male	25,000	20,000	S	S	S	S	S	S	S
Female	25,000	22,500	S	S	S	S	S	S	S
Engineers, total	55,000	40,000	50,000	56,000	62,300	65,000	68,000	70,000	62,000
Male	57,000	40,000	50,000	57,000	63,000	65,000	68,000	70,000	62,000
Female	49,500	40,000	49,000	53,200	60,000	55,000	S	S	S
Non-S&E occupations, total	40,000	25,000	35,000	44,000	46,000	47,000	50,000	51,000	50,000
Male	45,000	28,000	38,000	48,000	52,000	50,000	54,000	60,000	58,000
Female	31,200	24,000	30,000	37,500	37,000	37,000	36,400	40,800	39,000
Managers/administrators	56,000	33,000	44,000	52,000	60,000	60,000	70,000	75,000	70,000
Male	63,000	35,000	50,000	60,000	66,600	63,000	72,000	80,100	75,000
Female	43,000	30,000	38,000	45,000	50,000	52,500	52,000	50,000	44,000
Other non-S&E occupations	35,000	25,000	32,400	38,900	40,000	40,000	40,000	44,000	41,000
Male	40,000	27,000	35,500	42,000	44,000	44,000	45,000	49,000	48,000
Female	29,000	23,000	30,000	35,000	35,000	33,300	33,000	38,000	37,000

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-8.
Median annual salaries of U.S. scientists and engineers, by highest degree attained, occupation, sex, and years since degree: 1997

Highest degree, occupation and sex	Employed S&Es, total	Years since degree							
		<5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
				Master's					
All occupations, total	53,000	42,000	52,000	56,000	60,000	60,000	58,000	62,000	60,000
Male	60,000	49,000	57,000	61,900	65,000	67,000	62,000	70,000	70,000
Female	43,000	35,000	45,000	46,300	47,000	50,000	45,000	44,000	35,000
S&E occupations, total	59,000	47,500	57,000	63,000	65,000	65,300	69,000	67,700	69,000
Male	60,000	50,000	59,000	65,000	67,500	69,500	70,000	70,000	72,100
Female	48,000	38,000	50,000	53,000	50,000	52,000	55,000	50,000	S
Scientists, total	54,000	43,000	52,000	60,000	60,000	59,900	61,000	60,000	67,300
Male	58,000	48,000	55,000	63,000	65,000	62,000	62,000	65,000	70,000
Female	46,000	35,000	47,000	50,000	50,000	52,000	56,900	50,000	S
Computer/math scientists, total	60,000	52,000	60,000	67,000	65,000	66,000	70,000	63,500	S
Male	62,500	53,000	60,000	69,000	67,000	68,000	70,000	65,000	S
Female	56,000	50,000	54,600	63,000	60,000	60,000	67,000	S	S
Life/related scientists, total	42,000	31,000	36,400	43,800	47,000	52,000	52,000	S	S
Male	44,500	31,000	36,400	44,000	51,000	52,000	55,000	S	S
Female	38,000	34,000	37,000	43,800	41,000	S	S	S	S
Physical/related scientists, total	51,000	35,000	46,000	57,600	61,600	60,000	52,200	70,000	S
Male	52,000	35,000	48,000	56,000	66,600	62,000	50,000	70,000	S
Female	47,000	36,000	43,000	62,700	S	S	S	S	S
Social/related scientists, total	41,100	30,000	37,000	46,000	47,500	48,000	54,000	60,000	S
Male	46,000	33,500	40,000	52,200	52,000	48,000	53,000	S	S
Female	37,000	30,000	36,000	44,200	46,000	45,000	S	S	S
Engineers, total	63,600	50,000	60,000	68,900	70,000	74,000	75,000	78,500	76,500
Male	65,000	51,000	60,000	68,900	70,000	74,000	75,000	78,500	83,000
Female	55,000	49,000	56,000	70,000	62,700	S	S	S	S
Non-S&E occupations, total	50,000	38,000	50,000	50,000	54,000	58,500	52,200	60,000	55,000
Male	59,000	45,000	54,500	58,500	62,000	65,000	58,000	65,000	60,000
Female	42,000	34,000	43,200	45,000	46,500	48,000	43,500	42,000	35,000
Managers/administrators	68,000	55,000	65,000	65,000	69,000	77,000	75,000	87,000	80,000
Male	75,000	60,000	71,000	72,000	75,000	80,000	83,900	96,000	80,000
Female	55,900	45,000	60,000	58,000	60,000	65,000	44,000	S	S
Other non-S&E occupations	42,000	34,000	41,600	43,000	45,000	46,500	48,000	46,000	36,000
Male	46,400	38,000	45,000	47,000	47,000	50,000	50,000	46,000	43,000
Female	38,800	32,000	39,000	40,000	42,000	41,200	43,500	43,000	31,000

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-8.
Median annual salaries of U.S. scientists and engineers, by highest degree attained, occupation, sex, and years since degree: 1997

Highest degree, occupation and sex	Employed S&Es, total	Years since degree							
		<5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
				Doctorate					
All occupations, total	63,000	42,500	56,000	62,000	70,000	74,100	76,000	80,000	79,000
Male	67,000	48,000	60,000	65,000	71,600	75,000	78,500	80,100	80,000
Female	50,000	38,000	50,000	57,000	60,000	63,000	60,000	60,000	62,000
S&E occupations, total	62,000	43,600	56,000	62,000	70,000	71,700	73,300	78,000	79,000
Male	65,000	48,000	59,000	65,000	70,200	73,000	75,000	78,000	80,000
Female	50,000	37,000	50,000	56,000	59,000	63,000	60,000	65,700	60,000
Scientists, total	60,000	40,000	52,000	60,000	66,000	69,000	70,000	75,000	78,000
Male	62,000	42,000	54,000	62,000	70,000	70,000	71,000	75,000	79,000
Female	50,000	36,000	49,900	55,000	59,000	62,500	60,000	65,700	60,000
Computer/math scientists, total	65,000	55,000	65,000	65,000	70,000	69,000	69,000	70,000	76,400
Male	67,000	56,000	67,300	66,000	72,600	70,000	69,100	70,000	76,400
Female	57,000	45,000	60,000	60,000	63,000	56,000	56,700	S	S
Life/related scientists, total	57,500	30,000	50,000	60,000	66,900	68,100	72,000	75,000	78,000
Male	60,000	32,000	52,000	62,000	68,000	70,000	75,000	75,000	78,000
Female	48,000	30,000	49,500	57,000	59,900	60,000	60,000	80,000	S
Physical/related scientists, total	65,000	44,500	55,000	65,000	74,900	75,000	75,000	80,000	80,000
Male	66,900	45,000	55,000	65,400	75,000	76,000	75,000	80,100	80,500
Female	54,300	40,000	54,000	58,000	59,000	68,000	66,000	S	S
Social/related scientists, total	54,000	40,000	48,500	57,000	60,000	63,000	65,000	70,000	72,100
Male	58,000	41,000	50,000	58,000	62,000	63,000	67,000	70,000	74,900
Female	48,000	38,000	47,800	53,000	57,500	64,000	60,000	64,000	S
Engineers, total	72,000	60,000	68,500	74,000	80,000	85,000	85,000	85,000	83,000
Male	72,100	60,000	69,000	73,000	80,000	85,000	85,000	85,000	83,000
Female	60,000	52,000	61,000	75,000	80,000	S	S	S	S
Non-S&E occupations, total	65,000	41,000	59,000	65,000	70,000	77,700	87,000	94,000	78,000
Male	72,000	45,000	60,400	68,000	72,100	82,000	90,000	98,000	80,000
Female	52,000	40,000	51,000	59,300	65,000	61,000	62,000	35,000	S
Managers/administrators	83,500	60,000	72,000	80,100	85,000	90,000	97,200	105,000	90,000
Male	86,200	65,000	72,000	84,000	90,000	90,000	98,000	110,000	90,000
Female	70,800	46,000	80,000	77,100	77,900	70,000	77,000	70,000	S
Other non-S&E occupations	52,300	37,000	50,000	53,000	58,000	65,000	75,000	73,000	62,500
Male	60,000	38,000	53,000	53,000	58,000	70,000	75,600	80,000	62,500
Female	45,000	37,000	45,000	52,000	57,600	58,000	46,000	S	S

S = suppressed for reasons of confidentiality and/or data reliability

[a]Includes professional degrees.

NOTES: The term "Scientists and Engineers" (S&Es) includes all people who have ever received a bachelor's degree or higher in an S&E field, plus people holding a non-S&E bachelor's or higher degree who were employed in an S&E occupation during the 1993, 1995, or 1997 SESTAT surveys. Figures are rounded to nearest hundred. Details may not add to total because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See page 3-8 and figures 3-5 and 3-10 in Volume 1.

Appendix table 3-9.
Employed U.S. scientists and engineers, by highest degree attained, occupation, sex, and years since degree: 1997

Occupation and sex	Employed S&Es, total	Years since degree: <5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
All degree levels[a]									
All occupations, total	10,585,600	1,892,900	1,742,500	1,726,000	1,616,600	1,548,200	1,033,900	523,600	501,800
Male	7,037,600	1,033,700	1,067,800	1,108,700	1,091,200	1,111,600	794,100	412,200	418,500
Female	3,548,000	859,200	674,800	617,300	525,400	436,600	239,900	111,500	83,300
S&E occupations, total	3,369,400	679,300	624,800	610,300	499,400	391,500	275,600	152,300	136,200
Male	2,606,100	474,400	457,900	463,200	387,800	321,200	241,700	134,800	125,100
Female	763,300	204,900	166,900	147,200	111,500	70,300	33,800	17,500	11,200
Scientists, total	1,995,100	428,100	383,000	363,400	292,600	239,300	156,700	76,800	55,100
Male	1,355,400	262,900	249,800	242,200	196,400	173,400	125,000	60,300	45,400
Female	639,600	165,100	133,200	121,200	96,300	66,000	31,700	16,500	9,700
Computer/math scientists, total	1,039,500	190,400	211,700	220,000	156,800	125,100	81,700	35,300	18,600
Male	758,600	141,400	151,100	157,600	113,300	91,000	62,900	26,800	14,500
Female	280,900	49,000	60,600	62,400	43,400	34,100	18,800	8,500	4,100
Life/related scientists, total	321,800	73,100	62,900	45,300	46,600	40,100	25,900	15,700	12,200
Male	205,900	38,500	35,700	27,500	28,200	31,300	21,800	12,000	10,900
Female	115,900	34,600	27,200	17,800	18,400	8,800	4,100	3,600	1,300
Physical/related scientists, total	284,900	62,600	52,300	43,500	39,000	29,500	26,900	14,700	16,200
Male	223,100	43,100	39,100	33,300	32,100	23,500	24,100	13,300	14,600
Female	61,800	19,600	13,200	10,300	6,900	6,000	2,800	1,400	1,600
Social/related scientists, total	349,000	101,900	56,100	54,600	50,300	44,600	22,200	11,100	8,000
Male	167,900	39,900	23,900	23,800	22,800	27,600	16,300	8,200	5,400
Female	181,100	62,000	32,200	30,800	27,500	17,000	6,000	2,900	2,600
Engineers, total	1,374,400	251,200	241,800	246,900	206,800	152,200	118,800	75,500	81,200
Male	1,250,700	211,500	208,100	221,000	191,500	147,800	116,700	74,400	79,700
Female	123,700	39,800	33,700	25,900	15,300	4,400	2,100	1,000	1,500
Non-S&E occupations, total	7,216,200	1,213,600	1,117,700	1,115,700	1,117,200	1,156,700	758,300	371,400	365,500
Male	4,431,500	559,300	609,800	645,600	703,400	790,300	552,300	277,400	293,400
Female	2,784,700	654,300	507,900	470,100	413,900	366,300	206,000	94,000	72,200
Managers/administrators	2,019,900	189,500	257,900	329,400	353,000	390,100	258,700	130,200	111,100
Male	1,453,100	111,100	153,400	218,000	253,100	295,600	215,600	108,000	98,400
Female	566,800	78,400	104,500	111,500	99,900	94,500	43,100	22,200	12,700
Other non-S&E occupations	5,196,300	1,024,100	859,800	786,300	764,200	766,600	499,700	241,200	254,400
Male	2,978,400	448,200	456,400	427,600	450,300	494,700	336,800	169,400	195,000
Female	2,217,900	575,900	403,400	358,600	313,900	271,800	162,900	71,800	59,400
Bachelor's									
All occupations, total	6,193,700	1,117,100	990,900	975,500	900,100	889,500	628,000	332,700	359,800
Male	4,056,500	596,300	600,400	642,500	601,900	616,300	460,700	247,600	290,900
Female	2,137,200	520,800	390,500	333,000	298,300	273,200	167,400	85,100	68,900
S&E occupations, total	1,916,800	344,100	347,800	376,200	295,300	215,000	152,500	89,700	96,200
Male	1,521,800	245,200	261,400	294,600	237,100	179,600	135,400	79,300	89,200
Female	395,000	98,900	86,400	81,600	58,100	35,400	17,100	10,400	7,000
Scientists, total	1,000,200	200,400	197,200	199,200	147,700	118,100	73,300	36,000	28,300
Male	688,400	126,800	131,900	136,100	101,500	85,600	57,800	26,400	22,200
Female	311,800	73,600	65,300	63,100	46,200	32,400	15,400	9,600	6,100
Computer/math scientists, total	675,300	102,700	132,100	159,300	104,400	86,100	53,400	24,200	13,200
Male	487,900	77,700	92,100	112,200	74,700	63,400	41,100	17,300	9,400
Female	187,400	25,000	40,000	47,100	29,700	22,700	12,300	6,800	3,800
Life/related scientists, total	125,200	32,700	26,300	14,900	17,800	14,200	8,100	6,600	4,700
Male	74,300	16,200	14,600	7,700	8,700	11,200	6,800	5,100	4,100
Female	50,900	16,500	11,800	7,200	9,100	3,000	1,300	1,500	600
Physical/related scientists, total	131,700	31,400	25,900	19,400	19,700	11,500	10,200	4,700	8,900
Male	97,100	20,100	19,200	14,000	16,000	7,400	9,000	3,800	7,600
Female	34,600	11,300	6,700	5,400	3,700	4,100	1,100	900	1,300

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-9.
Employed U.S. scientists and engineers, by highest degree attained, occupation, sex, and years since degree: 1997

Occupation and sex	Employed S&Es, total	Years since degree: <5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
Social/related scientists, total	68,000	33,700	12,900	5,700	5,800	6,200	1,700	600	1,500
Male	29,100	12,900	6,000	2,200	2,100	3,700	1,000	100	1,100
Female	38,900	20,800	6,900	3,500	3,700	2,500	700	500	300
Engineers, total	916,600	143,700	150,500	177,000	147,600	96,900	79,200	53,700	67,900
Male	833,400	118,400	129,400	158,500	135,600	94,000	77,500	53,000	67,000
Female	83,200	25,300	21,100	18,500	12,000	3,000	1,700	800	900
Non-S&E occupations, total	4,276,900	773,000	643,100	599,300	604,900	674,500	475,500	243,000	263,600
Male	2,534,700	351,000	339,100	347,900	364,700	436,700	325,300	168,300	201,600
Female	1,742,200	421,900	304,100	251,400	240,100	237,900	150,200	74,700	61,900
Managers/administrators	1,141,100	88,700	125,700	178,900	187,700	225,200	158,700	88,600	87,700
Male	808,500	47,200	70,600	120,800	135,500	160,900	127,000	70,200	76,200
Female	332,600	41,400	55,100	58,100	52,200	64,300	31,700	18,400	11,400
Other non-S&E occupations	3,135,800	684,300	517,400	420,400	417,200	449,400	316,900	154,400	175,900
Male	1,726,200	303,800	268,400	227,100	229,300	275,800	198,300	98,100	125,400
Female	1,409,600	380,500	249,000	193,300	187,900	173,600	118,600	56,300	50,500
Master's									
All occupations, total	2,819,800	543,700	501,400	474,400	450,600	413,000	260,300	110,800	65,600
Male	1,800,500	298,900	302,200	281,300	284,900	289,700	199,700	88,700	55,000
Female	1,019,300	244,800	199,200	193,100	165,600	123,400	60,600	22,100	10,600
S&E occupations, total	967,900	238,900	194,000	157,900	135,600	115,100	70,200	35,600	20,700
Male	715,300	166,600	139,900	113,300	98,900	90,400	58,700	30,200	17,500
Female	252,600	72,300	54,100	44,700	36,700	24,700	11,500	5,300	3,200
Scientists, total	592,000	150,100	118,400	98,500	85,800	69,200	40,600	19,000	10,400
Male	374,400	90,300	75,100	60,300	52,000	45,600	29,400	13,900	7,700
Female	217,600	59,800	43,300	38,200	33,800	23,500	11,100	5,100	2,700
Computer/math scientists, total	301,600	73,600	68,700	51,800	43,600	31,400	20,500	8,300	3,800
Male	219,300	53,400	50,700	37,600	32,000	20,600	14,600	6,800	3,500
Female	82,300	20,200	18,000	14,200	11,600	10,700	5,800	1,500	300
Life/related scientists, total	70,300	17,100	14,500	10,400	10,700	9,300	4,700	2,500	1,000
Male	40,000	8,500	7,300	6,100	5,900	7,200	3,400	1,000	600
Female	30,300	8,600	7,300	4,400	4,800	2,100	1,200	1,400	500
Physical/related scientists, total	69,100	16,900	13,000	10,900	8,500	7,800	6,400	3,400	2,200
Male	52,600	11,600	9,300	8,100	6,500	6,600	5,400	2,900	2,100
Female	16,500	5,300	3,700	2,800	2,000	1,200	1,100	400	100
Social/related scientists, total	151,100	42,500	22,200	25,400	23,000	20,600	9,000	4,800	3,400
Male	62,500	16,700	7,900	8,600	7,600	11,100	6,000	3,100	1,600
Female	88,600	25,800	14,400	16,900	15,400	9,500	3,000	1,700	1,800
Engineers, total	375,900	88,800	75,600	59,400	49,700	45,900	29,600	16,600	10,300
Male	340,900	76,300	64,700	53,000	46,800	44,800	29,200	16,300	9,700
Female	34,900	12,400	10,800	6,400	2,900	1,200	400	300	500
Non-S&E occupations, total	1,851,900	304,900	307,400	316,400	315,000	298,000	190,100	75,200	44,900
Male	1,085,200	132,300	162,300	168,000	186,100	199,300	141,100	58,500	37,600
Female	766,700	172,500	145,000	148,400	128,900	98,700	49,100	16,700	7,300
Managers/administrators	724,800	84,900	116,200	125,400	134,200	136,600	77,200	33,600	16,800
Male	522,400	53,100	71,800	80,100	94,700	110,100	66,800	30,200	15,700
Female	202,400	31,800	44,400	45,400	39,500	26,400	10,400	3,400	1,200
Other non-S&E occupations	1,127,100	220,000	191,200	191,000	180,800	161,400	112,900	41,600	28,100
Male	562,800	79,200	90,600	88,000	91,400	89,200	74,300	28,300	21,900
Female	564,300	140,800	100,700	103,100	89,400	72,300	38,600	13,400	6,200

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-9.
Employed U.S. scientists and engineers, by highest degree attained, occupation, sex, and years since degree: 1997

Occupation and sex	Employed S&Es, total	Years since degree							
		<5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
		Doctorate							
All occupations, total	696,000	127,900	116,300	108,600	99,400	93,400	85,300	39,500	25,600
Male	528,000	81,400	78,800	76,400	75,100	77,800	77,400	36,900	24,300
Female	168,000	46,500	37,600	32,200	24,400	15,600	7,900	2,600	1,200
S&E occupations, total	454,700	92,500	80,900	70,100	61,800	56,000	51,600	25,400	16,400
Male	348,300	60,400	56,000	50,900	47,800	47,300	46,500	23,800	15,700
Female	106,400	32,100	24,900	19,200	14,000	8,800	5,100	1,600	800
Scientists, total	375,300	74,200	65,400	60,000	53,100	46,800	41,700	20,200	13,800
Male	274,200	44,200	42,200	41,600	39,500	38,300	36,700	18,700	13,100
Female	101,000	30,000	23,200	18,300	13,600	8,500	5,000	1,600	800
Computer/math scientists, total	59,000	12,400	10,700	8,200	8,000	7,400	7,800	2,800	1,600
Male	48,500	9,100	8,100	7,000	5,900	6,800	7,200	2,700	1,600
Female	10,500	3,300	2,500	1,200	2,100	700	600	100	S
Life/related scientists, total	111,800	22,900	21,400	17,400	15,500	12,900	11,900	5,700	4,100
Male	80,600	13,600	13,500	11,900	11,900	10,300	10,400	5,200	3,800
Female	31,200	9,300	7,900	5,500	3,600	2,700	1,500	500	300
Physical/related scientists, total	83,700	14,100	13,500	13,200	10,600	10,100	10,300	6,700	5,100
Male	73,000	11,200	10,600	11,200	9,400	9,400	9,700	6,500	4,900
Female	10,700	3,000	2,800	2,000	1,200	700	600	200	200
Social/related scientists, total	120,800	24,800	19,900	21,200	19,000	16,400	11,600	5,000	3,000
Male	72,200	10,400	9,900	11,500	12,200	11,800	9,400	4,300	2,700
Female	48,600	14,400	10,000	9,600	6,800	4,500	2,200	700	300
Engineers, total	79,400	18,300	15,500	10,100	8,700	9,200	9,900	5,100	2,600
Male	74,100	16,200	13,800	9,200	8,300	9,000	9,900	5,100	2,600
Female	5,300	2,100	1,700	900	400	200	100	S	S
Non-S&E occupations, total	241,300	35,500	35,400	38,500	37,600	37,400	33,700	14,100	9,100
Male	179,700	21,000	22,800	25,500	27,300	30,500	30,800	13,100	8,700
Female	61,700	14,500	12,700	13,000	10,400	6,900	2,800	1,000	500
Managers/administrators	102,400	9,800	12,300	14,500	18,600	21,000	16,800	6,200	3,100
Male	83,200	7,100	7,800	10,800	14,200	18,500	15,800	5,900	3,000
Female	19,200	2,700	4,400	3,700	4,300	2,600	1,000	300	100
Other non-S&E occupations	138,900	25,600	23,200	24,000	19,100	16,400	16,800	7,900	6,000
Male	96,500	13,900	14,900	14,700	13,000	12,100	15,000	7,200	5,700
Female	42,400	11,800	8,200	9,200	6,000	4,300	1,900	700	300

S = Suppressed for reasons of confidentiality and/or data reliability

[a]Includes professional degrees.

NOTES: The term "Scientists and Engineers" (S&Es) includes all persons who have ever received a bachelor's degree or higher in a science or engineering (S&E) field, plus persons holding a non-S&E bachelor's or higher degree who were employed in a S&E occupation during either the 1993, 1995 or 1997 SESTAT surveys. Figures are rounded to nearest hundred. Details may not add to total because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See p. 3–10 in Volume 1.

Appendix table 3-10.
Employed U.S. scientists and engineers, by highest degree attained, occupation, sex, and race or ethnicity: 1997

Highest degree and occupation	Employed S&Es, total	Sex		Race/ethnicity				
		Male	Female	White	Black	Hispanic	Asian	Other
All degree levels[a]								
All occupations, total	10,585,600	7,037,600	3,548,000	8,877,500	555,600	371,500	745,600	35,400
S&E occupations, total	3,369,400	2,606,100	763,300	2,791,900	113,000	103,500	349,800	11,300
Scientists, total	1,995,200	1,355,500	639,700	1,654,600	77,500	55,800	200,100	7,200
Computer/math scientists, total	1,039,500	758,600	280,900	839,400	44,900	26,200	126,600	2,500
Life/related scientists, total	321,800	205,900	115,900	272,400	7,700	8,000	32,300	1,400
Physical/related scientists, total	284,900	223,100	61,800	240,200	8,400	7,200	27,900	1,200
Social/related scientists, total	349,000	167,900	181,100	302,600	16,500	14,400	13,300	2,100
Engineers, total	1,374,400	1,250,700	123,700	1,137,300	35,400	47,700	149,700	4,200
Non-S&E occupations, total	7,216,200	4,431,500	2,784,700	6,085,600	442,600	268,000	395,800	24,100
Managers/administrators	2,019,900	1,453,100	566,800	1,735,100	112,900	64,000	102,500	5,400
Other non-S&E occupations	5,196,300	2,978,400	2,217,900	4,350,500	329,700	204,000	293,400	18,700
Bachelor's								
All occupations, total	6,193,700	4,056,500	2,137,200	5,212,700	345,000	237,700	374,900	23,400
S&E occupations, total	1,916,800	1,521,800	395,000	1,631,800	72,600	62,200	143,200	7,000
Scientists, total	1,000,200	688,400	311,800	846,300	46,200	29,400	74,200	4,000
Computer/math scientists, total	675,300	487,900	187,400	566,600	33,100	18,100	55,800	1,700
Life/related scientists, total	125,200	74,300	50,900	110,000	3,000	3,300	8,000	900
Physical/related scientists, total	131,700	97,100	34,600	114,000	5,500	3,900	7,900	400
Social/related scientists, total	68,000	29,100	38,900	55,800	4,600	4,200	2,500	900
Engineers, total	916,600	833,400	83,200	785,600	26,300	32,800	68,900	3000
Non-S&E occupations, total	4,276,900	2,534,700	1,742,200	3,580,900	272,400	175,500	231,700	16,400
Managers/administrators	1,141,100	808,500	332,600	990,500	58,500	38,900	49,800	3,400
Other non-S&E occupations	3,135,800	1,726,200	1,409,600	2,590,300	213,900	136,700	181,900	13,000

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-10.
Employed U.S. scientists and engineers, by highest degree attained, occupation, sex, and race or ethnicity: 1997

Highest degree and occupation	Employed S&Es, total	Sex		Race/ethnicity				
		Male	Female	White	Black	Hispanic	Asian	Other
Master's								
All occupations, total	2,819,800	1,800,500	1,019,300	2,330,500	151,300	88,100	242,000	7,900
S&E occupations, total	967,900	715,300	252,600	770,200	30,000	29,300	135,800	2,700
Scientists, total	592,000	374,400	217,600	475,100	21,900	16,000	77,400	1,700
Computer/math scientists, total	301,600	219,300	82,300	226,400	10,300	6,300	57,900	600
Life/related scientists, total	70,300	40,000	30,300	59,400	2,500	1,400	6,700	200
Physical/related scientists, total	69,100	52,600	16,500	57,700	1,500	1,600	7,900	500
Social/related scientists, total	151,100	62,500	88,600	131,600	7,500	6,600	4,800	400
Engineers, total	375,900	340,900	34,900	295,100	8,100	13,300	58,400	1,000
Non-S&E occupations, total	1,851,900	1,085,200	766,700	1,560,300	121,400	58,900	106,200	5,200
Managers/administrators	724,800	522,400	202,400	613,900	44,700	21,600	43,000	1,700
Other non-S&E occupations	1,127,100	562,800	564,300	946,400	76,600	37,300	63,200	3,500
Doctorate								
All occupations, total	696,000	528,000	168,000	562,200	21,300	19,100	91,100	2,200
S&E occupations, total	454,700	348,300	106,400	363,600	9,600	10,700	69,200	1,600
Scientists, total	375,300	274,200	101,000	309,100	8,600	9,300	46,900	1,400
Computer/math scientists, total	59,000	48,500	10,500	43,800	1,100	1,600	12,300	200
Life/related scientists, total	111,800	80,600	31,200	90,700	1,800	2,600	16,500	300
Physical/related scientists, total	83,700	73,000	10,700	68,200	1,400	1,700	12,100	200
Social/related scientists, total	120,800	72,200	48,600	106,400	4,400	3,300	5,900	700
Engineers, total	79,400	74,100	5,300	54,500	1,100	1,500	22,300	100
Non-S&E occupations, total	241,300	179,700	61,700	198,700	11,700	8,400	21,900	700
Managers/administrators	102,400	83,200	19,200	85,700	5,200	2,400	8,800	200
Other non-S&E occupations	138,900	96,500	42,400	112,900	6,500	6,000	13,100	400

[a]Includes professional degrees.

NOTES: The term "Scientists and Engineers" (S&Es) includes all people who have ever received a bachelor's degree or higher in an S&E field, plus people holding a non-S&E bachelor's or higher degree who were employed in an S&E occupation during the 1993, 1995, or 1997 SESTAT surveys. Figures are rounded to nearest hundred. Details may not add to total because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See figure 3-9 in Volume 1.

Appendix table 3-11.
U.S. scientists and engineers, by highest degree attained, broad occupation, sex, and employment status: 1997

Occupation	S&Es, total	Employed			Unemployed/ seeking job	Not in labor force		
		Total	Full-time	Part-time		Total	Retired	Not seeking job
				All degree levels[a]				
All occupations, total[b]	12,512,000	10,585,600	9,476,700	1,109,000	191,900	1,734,600	1,005,100	729,500
Male	8,097,900	7,037,600	6,589,100	448,600	112,800	947,500	754,400	193,100
Female	4,414,100	3,548,000	2,887,600	660,400	79,100	787,100	250,700	536,400
S&E occupations, total	3,899,000	3,369,400	3,105,000	264,400	52,900	476,600	334,300	142,300
Male	3,000,600	2,606,100	2,469,000	137,100	35,900	358,600	303,900	54,700
Female	898,400	763,300	636,000	127,300	17,000	118,100	30,400	87,600
Scientists, total	2,261,500	1,995,100	1,791,000	204,000	30,000	236,400	126,000	110,500
Male	1,506,700	1,355,400	1,266,700	88,700	16,100	135,100	98,200	37,000
Female	754,800	639,600	524,300	115,300	13,900	101,300	27,800	73,500
Computer/math scientists, total	1,129,700	1,039,500	974,400	65,100	14,600	75,700	40,000	35,700
Male	809,200	758,600	727,500	31,100	8,000	42,600	31,300	11,400
Female	320,500	280,900	246,900	34,000	6,600	33,000	8,700	24,300
Life/related scientists, total	387,300	321,800	292,700	29,000	7,400	58,100	26,700	31,400
Male	242,700	205,900	192,200	13,700	4,100	32,800	20,500	12,300
Female	144,500	115,900	100,600	15,300	3,300	25,300	6,200	19,100
Physical/related scientists, total	343,500	284,900	259,500	25,300	4,600	54,100	37,000	17,200
Male	264,400	223,100	206,500	16,500	3,000	38,400	31,400	7,000
Female	79,100	61,800	53,000	8,800	1,600	15,800	5,600	10,200
Social/related scientists, total	401,000	349,000	264,400	84,500	3,500	48,500	22,300	26,200
Male	190,300	167,900	140,500	27,400	1,100	21,300	15,100	6,300
Female	210,600	181,100	123,900	57,200	2,400	27,200	7,300	19,900
Engineers, total	1,637,500	1,374,400	1,314,000	60,400	22,900	240,200	208,400	31,800
Male	1,493,900	1,250,700	1,202,300	48,400	19,800	223,400	205,700	17,700
Female	143,600	123,700	111,700	12,000	3,100	16,800	2,600	14,100
Non-S&E occupations, total	8,613,100	7,216,200	6,371,600	844,600	138,900	1,257,900	670,700	587,200
Male	5,097,300	4,431,500	4,120,100	311,400	76,900	588,900	450,500	138,500
Female	3,515,700	2,784,700	2,251,600	533,100	62,100	669,000	220,200	448,700
Managers/administrators	2,321,300	2,019,900	1,941,100	78,800	29,100	272,300	212,000	60,300
Male	1,663,700	1,453,100	1,413,400	39,700	19,600	191,000	177,800	13,200
Female	657,600	566,800	527,700	39,100	9,500	81,300	34,100	47,100
Other non-S&E occupations	6,291,800	5,196,300	4,430,500	765,700	109,800	985,700	458,800	526,900
Male	3,433,700	2,978,400	2,706,700	271,700	57,300	398,000	272,700	125,300
Female	2,858,100	2,217,900	1,723,800	494,000	52,600	587,700	186,100	401,600

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-11.
U.S. scientists and engineers, by highest degree attained, broad occupation, sex, and employment status: 1997

Occupation	S&Es, total	Employed			Unemployed/ seeking job	Not in labor force		Not seeking job
		Total	Full-time	Part-time		Total	Retired	
				Bachelor's				
All occupations, total	7,456,800	6,193,700	5,545,400	648,300	123,600	1,139,500	604,800	534,700
Male	4,731,300	4,056,500	3,811,600	244,900	71,900	602,900	462,600	140,200
Female	2,725,500	2,137,200	1,733,700	403,500	51,700	536,600	142,200	394,500
S&E occupations, total	2,252,100	1,916,800	1,794,800	122,000	31,800	303,500	214,100	89,400
Male	1,776,100	1,521,800	1,452,000	69,800	20,800	233,500	199,000	34,400
Female	476,000	395,000	342,800	52,200	11,000	70,000	15,100	54,900
Scientists, total	1,135,500	1,000,200	915,400	84,800	16,700	118,600	52,300	66,300
Male	757,900	688,400	649,500	38,900	7,900	61,600	39,100	22,400
Female	377,700	311,800	265,900	45,900	8,800	57,000	13,100	43,900
Computer/math scientists, total	731,900	675,300	639,100	36,200	10,500	46,000	21,000	25,000
Male	516,300	487,900	472,900	15,000	5,400	22,900	16,200	6,800
Female	215,600	187,400	166,200	21,200	5,100	23,100	4,900	18,200
Life/related scientists, total	158,100	125,200	111,400	13,800	3,100	29,900	8,700	21,200
Male	90,400	74,300	67,500	6,700	900	15,200	6,000	9,200
Female	67,800	50,900	43,900	7,000	2,200	14,700	2,700	11,900
Physical/related scientists, total	163,300	131,700	118,200	13,500	2,400	29,200	18,800	10,400
Male	117,600	97,100	88,700	8,400	1,300	19,200	15,000	4,200
Female	45,600	34,600	29,500	5,000	1,100	10,000	3,800	6,200
Social/related scientists, total	82,200	68,000	46,700	21,300	800	13,500	3,700	9,700
Male	33,600	29,100	20,400	8,700	300	4,200	2,000	2,200
Female	48,600	38,900	26,300	12,600	500	9,200	1,700	7,500
Engineers, total	1,116,600	916,600	879,400	37,200	15,100	184,900	161,800	23,000
Male	1,018,200	833,400	802,600	30,900	12,900	171,900	159,900	12,000
Female	98,300	83,200	76,900	6,300	2,200	12,900	1,900	11,000
Non-S&E occupations, total	5,204,700	4,276,900	3,750,600	526,300	91,800	836,000	390,700	445,300
Male	2,955,200	2,534,700	2,359,600	175,100	51,100	369,400	263,600	105,800
Female	2,249,500	1,742,200	1,391,000	351,200	40,600	466,700	127,100	339,500
Managers/administrators	1,319,600	1,141,100	1,095,300	45,800	14,200	164,300	129,800	34,500
Male	931,300	808,500	787,100	21,300	8,600	114,300	108,500	5,800
Female	388,300	332,600	308,200	24,500	5,600	50,000	21,400	28,700
Other non-S&E occupations	3,885,100	3,135,800	2,655,300	480,600	77,600	671,700	260,900	410,800
Male	2,023,900	1,726,200	1,572,500	153,800	42,600	255,100	155,100	99,900
Female	1,861,300	1,409,600	1,082,800	326,800	35,000	416,600	105,800	310,900

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-11.
U.S. scientists and engineers, by highest degree attained, broad occupation, sex, and employment status: 1997

Occupation	S&Es, total	Employed			Unemployed/ seeking job	Not in labor force		
		Total	Full-time	Part-time		Total	Retired	Not seeking job
				Master's				
All occupations, total	3,311,300	2,819,800	2,503,300	316,500	52,200	439,300	289,600	149,700
Male	2,066,000	1,800,500	1,675,000	125,500	29,800	235,700	197,100	38,600
Female	1,245,300	1,019,300	828,300	191,000	22,400	203,600	92,500	111,200
S&E occupations, total	1,100,000	967,900	863,800	104,100	14,000	118,200	76,300	41,900
Male	806,700	715,300	668,400	46,900	9,700	81,700	66,600	15,100
Female	293,300	252,600	195,300	57,300	4,300	36,500	9,600	26,900
Scientists, total	671,100	592,000	507,400	84,600	7,200	71,900	37,700	34,200
Male	416,900	374,400	342,000	32,400	3,600	38,900	28,700	10,200
Female	254,200	217,600	165,400	52,200	3,500	33,000	9,000	24,000
Computer/math scientists, total	328,500	301,600	277,400	24,200	3,100	23,800	14,600	9,200
Male	236,500	219,300	206,200	13,100	2,000	15,200	11,800	3,400
Female	91,900	82,300	71,200	11,100	1,000	8,600	2,800	5,800
Life/related scientists, total	83,800	70,300	61,700	8,500	1,200	12,400	5,700	6,600
Male	46,500	40,000	36,800	3,200	700	5,800	4,000	1,800
Female	37,300	30,300	24,900	5,300	500	6,600	1,700	4,900
Physical/related scientists, total	83,300	69,100	61,800	7,300	1,000	13,100	8,200	4,900
Male	62,500	52,600	48,100	4,500	600	9,300	7,500	1,800
Female	20,800	16,500	13,700	2,800	400	3,800	700	3,100
Social/related scientists, total	175,600	151,100	106,500	44,600	2,000	22,600	9,200	13,400
Male	71,500	62,500	50,900	11,600	400	8,600	5,400	3,200
Female	104,100	88,600	55,600	33,000	1,600	14,000	3,800	10,200
Engineers, total	428,900	375,900	356,300	19,500	6,800	46,300	38,500	7,700
Male	389,800	340,900	326,400	14,500	6,100	42,800	37,900	4,800
Female	39,100	34,900	29,900	5,000	700	3,500	600	2,900
Non-S&E occupations, total	2,211,300	1,851,900	1,639,600	212,400	38,100	321,200	213,400	107,800
Male	1,259,300	1,085,200	1,006,600	78,700	20,100	154,000	130,500	23,500
Female	952,000	766,700	633,000	133,700	18,100	167,200	82,900	84,300
Managers/administrators	826,600	724,800	698,500	26,300	13,300	88,400	65,700	22,800
Male	591,900	522,400	509,300	13,100	9,700	59,700	54,200	5,500
Female	234,700	202,400	189,200	13,200	3,600	28,700	11,400	17,300
Other non-S&E occupations	1,384,700	1,127,100	941,000	186,100	24,800	232,700	147,700	85,000
Male	667,400	562,800	497,300	65,500	10,300	94,300	76,300	18,000
Female	717,200	564,300	443,800	120,500	14,500	138,400	71,400	67,000

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-11.
U.S. scientists and engineers, by highest degree attained, broad occupation, sex, and employment status: 1997

Occupation	S&Es, total	Total	Full-time	Part-time	Unemployed/ seeking job	Total	Retired	Not seeking job
				Doctorate				
All occupations, total	789,700	696,000	637,400	58,700	9,700	83,900	67,700	16,200
Male	599,400	528,000	494,900	33,100	7,000	64,400	58,400	6,000
Female	190,300	168,000	142,500	25,600	2,700	19,500	9,300	10,300
S&E occupations, total	511,900	454,700	418,900	35,800	6,300	50,900	41,300	9,600
Male	393,700	348,300	328,900	19,500	4,800	40,600	36,500	4,100
Female	118,100	106,400	90,000	16,300	1,600	10,200	4,800	5,400
Scientists, total	422,700	375,300	342,800	32,400	5,300	42,100	33,500	8,600
Male	310,400	274,200	257,500	16,800	3,900	32,200	28,800	3,500
Female	112,300	101,000	85,300	15,700	1,400	9,900	4,700	5,200
Computer/math scientists, total	64,800	59,000	54,500	4,500	1,000	4,900	3,900	1,000
Male	53,000	48,500	45,700	2,800	600	3,900	3,100	900
Female	11,900	10,500	8,800	1,700	400	1,000	800	200
Life/related scientists, total	128,400	111,800	105,500	6,300	2,400	14,200	10,900	3,200
Male	92,800	80,600	77,000	3,500	1,800	10,400	9,400	1,000
Female	35,600	31,200	28,500	2,700	600	3,800	1,500	2,300
Physical/related scientists, total	96,100	83,700	79,200	4,500	1,200	11,200	9,500	1,700
Male	83,900	73,000	69,400	3,600	1,100	9,800	8,900	900
Female	12,200	10,700	9,800	900	100	1,400	600	800
Social/related scientists, total	133,300	120,800	103,600	17,200	800	11,800	9,200	2,600
Male	80,800	72,200	65,400	6,800	500	8,200	7,400	700
Female	52,500	48,600	38,200	10,400	300	3,600	1,800	1,900
Engineers, total	89,200	79,400	76,100	3,300	1,000	8,800	7,800	900
Male	83,300	74,100	71,400	2,700	800	8,400	7,700	700
Female	5,900	5,300	4,700	700	200	400	100	300
Non-S&E occupations, total	277,800	241,300	218,400	22,900	3,400	33,100	26,400	6,700
Male	205,700	179,700	166,000	13,700	2,300	23,700	21,900	1,800
Female	72,100	61,700	52,400	9,200	1,100	9,300	4,500	4,800
Managers/administrators	115,300	102,400	98,300	4,100	1,200	11,700	10,600	1,100
Male	94,600	83,200	80,100	3,100	800	10,600	9,700	900
Female	20,700	19,200	18,200	1,000	300	1,100	900	200
Other non-S&E occupations	162,500	138,900	120,200	18,800	2,200	21,300	15,800	5,600
Male	111,100	96,500	85,900	10,600	1,400	13,100	12,200	1,000
Female	51,500	42,400	34,200	8,200	800	8,200	3,600	4,600

[a]Includes professional degrees.

[b]Total excludes 18,700 individuals who reported never having worked. For unemployed individuals, occupation is for their previous reported job.

NOTES: The term "Scientists and Engineers" (S&Es) includes all people who have ever received a bachelor's degree or higher in an S&E field, plus people holding a non-S&E bachelor's or higher degree who were employed in an S&E occupation during the 1993, 1995, or 1997 SESTAT surveys. Figures are rounded to nearest hundred. Details may not add to total because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See p. 3–11 in Volume 1.

Appendix table 3-12.
Employed U.S. scientists and engineers, by highest degree attained, broad occupation, sex, and employment sector: 1997

Occupation and sex	Employed S&Es, total	Business/industry				Educational institution			Government		
		Total	Profit	Self-employed	Non-profit	Total	4–yr. college/ university	Other	Total	Federal	State/ local
					All degree levels[a]						
All occupations, total	10,585,600	7,264,900	5,910,800	728,100	625,900	1,953,500	940,600	1,012,900	1,367,300	575,100	792,100
Male	7,037,600	5,148,100	4,363,500	501,900	282,800	959,400	551,600	407,800	930,200	437,400	492,800
Female	3,548,000	2,116,800	1,547,300	226,200	343,200	994,100	389,000	605,100	437,100	137,800	299,300
S&E occupations, total	3,369,400	2,343,600	2,126,400	110,100	107,000	586,700	475,700	111,000	439,100	250,600	188,600
Male	2,606,100	1,883,400	1,750,300	73,200	59,800	383,000	325,400	57,600	339,800	200,100	139,600
Female	763,300	460,200	376,100	36,900	47,200	203,700	150,300	53,400	99,400	50,400	48,900
Scientists, total	1,995,100	1,236,900	1,066,000	81,000	89,800	512,700	409,100	103,600	245,500	139,600	105,900
Male	1,355,400	869,100	779,800	45,900	43,400	316,300	265,500	50,800	170,000	102,400	67,600
Female	639,600	367,700	286,300	35,100	46,400	196,400	143,600	52,800	75,500	37,200	38,300
Computer/math scientists, total	1,039,500	828,900	771,800	25,100	32,000	121,200	88,200	33,000	89,400	53,300	36,100
Male	758,600	616,600	578,300	19,700	18,600	78,900	59,100	19,800	63,100	39,800	23,200
Female	280,900	212,300	193,500	5,400	13,400	42,200	29,100	13,100	26,300	13,400	12,900
Life/related scientists, total	321,800	102,700	81,400	8,000	13,300	154,500	139,100	15,400	64,600	37,900	26,700
Male	205,900	66,000	53,100	5,900	6,900	94,300	86,400	7,900	45,600	27,700	17,900
Female	115,900	36,700	28,300	2,100	6,300	60,200	52,700	7,600	19,000	10,300	8,700
Physical/related scientists, total	284,900	156,100	144,800	6,200	5,100	80,000	71,100	8,900	48,700	30,500	18,200
Male	223,100	122,800	113,300	5,800	3,800	63,100	57,200	6,000	37,100	23,400	13,700
Female	61,800	33,300	31,600	400	1,300	16,900	14,000	2,900	11,600	7,200	4,400
Social/related scientists, total	349,000	149,200	68,000	41,700	39,400	157,000	110,600	46,400	42,800	17,900	24,900
Male	167,900	63,700	35,100	14,500	14,100	79,900	62,800	17,100	24,200	11,500	12,700
Female	181,100	85,400	32,900	27,200	25,300	77,100	47,800	29,300	18,600	6,300	12,300
Engineers, total	1,374,400	1,106,700	1,060,400	29,100	17,200	74,000	66,700	7,400	193,600	110,900	82,700
Male	1,250,700	1,014,200	970,500	27,300	16,400	66,700	59,900	6,800	169,800	97,700	72,100
Female	123,700	92,500	89,900	1,800	800	7,300	6,800	600	23,900	13,200	10,600
Non-S&E occupations, total	7,216,200	4,921,300	3,784,400	618,000	518,900	1,366,800	464,800	901,900	928,100	324,600	603,600
Male	4,431,500	3,264,700	2,613,100	428,600	223,000	576,400	226,200	350,200	590,400	237,200	353,200
Female	2,784,700	1,656,600	1,171,200	189,400	296,000	790,400	238,700	551,700	337,700	87,300	250,400
Managers/administrators	2,019,900	1,527,000	1,318,800	70,000	138,300	190,000	90,300	99,700	303,000	122,700	180,200
Male	1,453,100	1,136,900	1,015,000	48,100	73,800	101,400	46,100	55,300	214,700	93,900	120,800
Female	566,800	390,100	303,700	21,900	64,400	88,500	44,200	44,300	88,200	28,800	59,400
Other non-S&E occupations	5,196,300	3,394,300	2,465,600	548,000	380,700	1,176,800	374,500	802,300	625,200	201,800	423,400
Male	2,978,400	2,127,800	1,598,100	380,500	149,100	474,900	180,100	294,900	375,700	143,300	232,400
Female	2,217,900	1,266,500	867,500	167,500	231,500	701,900	194,500	507,400	249,500	58,500	191,000

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-12.
Employed U.S. scientists and engineers, by highest degree attained, broad occupation, sex, and employment sector: 1997

Occupation and sex	Employed S&Es, total	Business/industry				Educational institution			Government		
		Total	Profit	Self-employed	Non-profit	Total	4–yr. college/ university	Other	Total	Federal	State/ local
					Bachelor's						
All occupations, total	6,193,700	4,582,200	3,903,100	360,500	318,600	780,800	317,600	463,200	830,700	337,900	492,900
Male	4,056,500	3,186,700	2,821,600	244,200	120,900	309,600	147,500	162,100	560,200	253,400	306,800
Female	2,137,200	1,395,500	1,081,500	116,200	197,700	471,200	170,000	301,100	270,500	84,400	186,100
S&E occupations, total	1,916,800	1,497,700	1,402,900	47,300	47,500	155,800	130,700	25,100	263,300	141,000	122,300
Male	1,521,800	1,224,200	1,157,200	39,600	27,400	92,000	77,800	14,300	205,500	111,900	93,600
Female	395,000	273,500	245,800	7,700	20,100	63,800	53,000	10,800	57,700	29,000	28,700
Scientists, total	1,000,200	740,100	672,100	29,500	38,500	131,200	110,200	21,100	128,900	69,200	59,700
Male	688,400	529,400	487,600	23,100	18,800	70,500	60,000	10,500	88,500	49,300	39,200
Female	311,800	210,600	184,600	6,400	19,700	60,800	50,100	10,600	40,400	19,900	20,500
Computer/math scientists, total	675,300	571,700	531,500	18,600	21,600	41,700	31,100	10,600	61,900	35,500	26,400
Male	487,900	420,400	394,500	14,000	11,900	25,600	19,400	6,200	41,900	25,000	16,900
Female	187,400	151,200	137,000	4,500	9,700	16,200	11,800	4,400	20,000	10,500	9,500
Life/related scientists, total	125,200	49,300	40,400	4,700	4,200	41,200	36,600	4,600	34,700	18,500	16,200
Male	74,300	29,400	24,300	4,100	1,000	20,700	18,000	2,800	24,200	14,300	9,900
Female	50,900	19,900	16,100	600	3,200	20,500	18,700	1,800	10,500	4,200	6,300
Physical/related scientists, total	131,700	87,300	81,800	3,600	1,900	21,900	20,600	1,300	22,400	11,100	11,300
Male	97,100	64,900	60,200	3,400	1,300	15,400	14,700	700	16,800	8,000	8,800
Female	34,600	22,400	21,600	200	600	6,500	5,900	600	5,600	3,200	2,500
Social/related scientists, total	68,000	31,800	18,400	2,700	10,700	26,400	21,700	4,600	9,900	4,100	5,800
Male	29,100	14,700	8,600	1,600	4,600	8,800	8,000	800	5,600	2,100	3,500
Female	38,900	17,100	9,900	1,100	6,100	17,600	13,800	3,800	4,200	2,000	2,300
Engineers, total	916,600	757,700	730,800	17,800	9,100	24,600	20,600	4,000	134,400	71,800	62,600
Male	833,400	694,800	669,600	16,500	8,700	21,600	17,800	3,800	117,100	62,600	54,400
Female	83,200	62,800	61,200	1,300	400	3,000	2,800	200	17,300	9,200	8,100
Non-S&E occupations, total	4,276,900	3,084,500	2,500,100	313,200	271,100	625,000	186,900	438,100	567,500	196,900	370,600
Male	2,534,700	1,962,500	1,664,400	204,600	93,500	217,600	69,800	147,800	354,600	141,500	213,200
Female	1,742,200	1,122,000	835,800	108,600	177,600	407,400	117,100	290,300	212,800	55,400	157,400
Managers/administrators	1,141,100	928,600	827,300	38,100	63,200	55,200	33,400	21,800	157,300	64,500	92,800
Male	808,500	679,900	626,100	25,000	28,800	22,200	12,200	10,000	106,400	46,400	60,000
Female	332,600	248,700	201,200	13,100	34,400	33,000	21,200	11,800	50,900	18,100	32,800
Other non-S&E occupations	3,135,800	2,155,800	1,672,900	275,100	207,900	569,800	153,500	416,300	410,200	132,400	277,800
Male	1,726,200	1,282,600	1,038,300	179,600	64,600	195,400	57,600	137,800	248,300	95,100	153,200
Female	1,409,600	873,200	634,500	95,500	143,200	374,400	95,900	278,500	162,000	37,300	124,600

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-12.
Employed U.S. scientists and engineers, by highest degree attained, broad occupation, sex, and employment sector: 1997

Occupation and sex	Employed S&Es, total	Business/industry				Educational institution			Government		
		Total	Profit	Self-employed	Non-profit	Total	4-yr. college/university	Other	Total	Federal	State/local
					Master's						
All occupations, total	2,819,800	1,736,000	1,370,600	150,200	215,200	711,400	219,300	492,100	372,500	157,000	215,500
Male	1,800,500	1,220,700	1,034,800	85,700	100,200	327,400	115,900	211,500	252,400	122,700	129,700
Female	1,019,300	515,300	335,800	64,500	115,000	383,900	103,400	280,500	120,100	34,300	85,800
S&E occupations, total	967,900	657,200	580,800	39,100	37,300	182,500	113,300	69,200	128,200	74,600	53,600
Male	715,300	512,000	474,200	19,700	18,100	106,100	72,200	33,900	97,200	59,700	37,500
Female	252,600	145,200	106,700	19,300	19,200	76,400	41,100	35,300	31,000	14,900	16,100
Scientists, total	592,000	357,100	296,400	29,400	31,400	158,800	92,700	66,100	76,100	41,500	34,600
Male	374,400	238,400	215,400	10,500	12,500	84,900	53,700	31,100	51,100	30,200	20,900
Female	217,600	118,700	81,000	18,900	18,900	73,900	38,900	35,000	25,000	11,300	13,700
Computer/math scientists, total	301,600	228,400	214,300	5,600	8,500	49,500	29,500	20,000	23,700	15,200	8,500
Male	219,300	171,800	161,500	4,900	5,400	29,500	17,300	12,200	18,000	12,700	5,300
Female	82,300	56,500	52,800	600	3,100	20,000	12,100	7,800	5,700	2,500	3,200
Life/related scientists, total	70,300	22,500	18,000	1,500	3,000	31,100	23,500	7,600	16,600	8,400	8,200
Male	40,000	13,100	11,000	600	1,500	15,000	12,100	3,000	11,900	5,500	6,300
Female	30,300	9,400	7,000	900	1,500	16,100	11,400	4,600	4,800	2,900	1,900
Physical/related scientists, total	69,100	35,600	33,300	1,200	1,100	18,400	13,200	5,200	15,200	9,600	5,600
Male	52,600	28,800	27,200	1,000	600	13,500	10,100	3,400	10,300	6,500	3,800
Female	16,500	6,800	6,100	100	500	4,800	3,100	1,800	4,900	3,100	1,800
Social/related scientists, total	151,100	70,700	30,800	21,100	18,800	59,800	26,500	33,300	20,600	8,300	12,300
Male	62,500	24,700	15,800	3,900	5,000	26,800	14,200	12,600	11,000	5,500	5,500
Female	88,600	46,000	15,000	17,200	13,800	33,000	12,300	20,700	9,600	2,800	6,800
Engineers, total	375,900	300,100	284,400	9,700	5,900	23,700	20,600	3,100	52,100	33,000	19,000
Male	340,900	273,600	258,700	9,300	5,600	21,200	18,500	2,800	46,100	29,400	16,600
Female	34,900	26,500	25,700	400	300	2,500	2,200	300	6,000	3,600	2,400
Non-S&E occupations, total	1,851,900	1,078,700	789,700	111,100	177,900	528,900	106,000	422,900	244,300	82,400	161,900
Male	1,085,200	708,700	560,600	65,900	82,200	221,300	43,700	177,600	155,200	63,000	92,200
Female	766,700	370,100	229,100	45,200	95,800	307,600	62,300	245,300	89,100	19,300	69,700
Managers/administrators	724,800	506,500	420,900	24,900	60,700	93,700	30,100	63,600	124,600	48,600	76,000
Male	522,400	379,800	328,500	17,600	33,700	50,900	14,300	36,600	91,700	39,500	52,200
Female	202,400	126,700	92,400	7,300	27,000	42,800	15,800	27,000	32,900	9,100	23,800
Other non-S&E occupations	1,127,100	572,200	368,900	86,200	117,200	435,200	75,800	359,300	119,700	33,800	85,900
Male	562,800	328,800	232,100	48,300	48,400	170,400	29,400	141,000	63,500	23,500	40,000
Female	564,300	243,400	136,800	37,900	68,800	264,700	46,400	218,300	56,100	10,200	45,900

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-12.
Employed U.S. scientists and engineers, by highest degree attained, broad occupation, sex, and employment sector: 1997

Occupation and sex	Employed S&Es, total	Business/industry				Educational institution			Government		
		Total	Profit	Self-employed	Non-profit	Total	4–yr. college/university	Other	Total	Federal	State/local
					Doctorate						
All occupations, total	696,000	289,100	212,500	38,300	38,300	341,800	302,000	39,800	65,100	42,500	22,600
Male	528,000	232,300	179,300	25,800	27,100	244,500	221,000	23,600	51,200	34,700	16,400
Female	168,000	56,800	33,200	12,400	11,200	97,300	81,000	16,200	13,900	7,800	6,200
S&E occupations, total	454,700	174,500	134,600	21,200	18,700	235,600	220,900	14,700	44,600	32,800	11,800
Male	348,300	137,900	113,200	12,400	12,400	175,200	166,800	8,400	35,200	26,900	8,300
Female	106,400	36,500	21,400	8,800	6,300	60,500	54,100	6,400	9,400	5,800	3,500
Scientists, total	375,300	127,200	91,200	19,600	16,400	209,900	195,400	14,500	38,100	27,300	10,800
Male	274,200	93,700	72,500	10,900	10,200	151,200	143,100	8,100	29,400	21,900	7,400
Female	101,000	33,600	18,600	8,700	6,200	58,700	52,300	6,300	8,800	5,400	3,400
Computer/math scientists, total	59,000	25,600	22,700	1,000	1,800	29,600	27,400	2,200	3,800	2,600	1,200
Male	48,500	21,700	19,700	700	1,300	23,500	22,200	1,300	3,200	2,200	1,100
Female	10,500	3,800	3,000	300	600	6,100	5,200	900	600	400	100
Life/related scientists, total	111,800	27,200	20,800	1,300	5,000	72,500	69,500	3,000	12,200	9,900	2,200
Male	80,600	20,800	16,300	1,000	3,500	50,700	48,800	1,900	9,100	7,400	1,700
Female	31,200	6,400	4,500	400	1,500	21,800	20,700	1,100	3,100	2,500	600
Physical/related scientists, total	83,700	33,100	29,700	1,300	2,100	39,700	37,300	2,400	10,800	9,500	1,300
Male	73,000	29,100	25,900	1,300	1,900	34,200	32,300	1,900	9,700	8,600	1,100
Female	10,700	4,100	3,800	100	200	5,500	5,000	500	1,100	900	200
Social/related scientists, total	120,800	41,400	18,000	16,000	7,400	68,000	61,200	6,800	11,400	5,300	6,100
Male	72,200	22,100	10,600	7,900	3,500	42,800	39,800	3,000	7,300	3,800	3,500
Female	48,600	19,300	7,300	8,000	3,900	25,300	21,400	3,800	4,100	1,600	2,500
Engineers, total	79,400	47,200	43,400	1,600	2,200	25,700	25,500	300	6,500	5,500	1,000
Male	74,100	44,300	40,700	1,500	2,100	23,900	23,700	300	5,900	5,000	900
Female	5,300	2,900	2,800	100	100	1,800	1,800	S	600	500	100
Non-S&E occupations, total	241,300	114,700	77,900	17,100	19,700	106,200	81,100	25,100	20,500	9,700	10,800
Male	179,700	94,400	66,100	13,500	14,800	69,400	54,200	15,200	15,900	7,800	8,100
Managers/administrators	102,400	55,200	43,200	3,000	9,000	34,000	22,700	11,200	13,300	6,500	6,800
Male	83,200	47,900	38,300	2,600	7,000	24,500	17,200	7,300	10,800	5,400	5,400
Female	19,200	7,300	4,900	400	2,000	9,500	5,600	3,900	2,500	1,100	1,400
Other non-S&E occupations	138,900	59,500	34,700	14,100	10,700	72,200	58,400	13,800	7,200	3,300	4,000
Male	96,500	46,500	27,800	10,900	7,800	44,900	37,000	7,900	5,100	2,400	2,700
Female	42,400	13,000	6,900	3,200	2,900	27,300	21,400	6,000	2,100	800	1,300

S = suppressed for reasons of confidentiality and/or data reliability

[a]Includes professional degrees.

NOTES: The term "Scientists and Engineers" (S&Es) includes all people who have ever received a bachelor's degree or higher in an S&E field, plus people holding a non-S&E bachelor's or higher degree who were employed in an S&E occupation during either the 1993, 1995, or 1997 SESTAT surveys. Figures are rounded to nearest hundred. Details may not add to total because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See page 3-11 in Volume 1.

Appendix table 3-13.
U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and employment status: 1997

Occupation and race/ethnicity	S&Es, total	Employed			Unemployed/seeking job	Not in labor force		
		Total	Full-time	Part-time		Total	Retired	Not seeking job
All degree levels[a]								
All occupations, total[b]	12,512,000	10,585,600	9,476,700	1,109,000	191,900	1,734,600	1,005,100	729,500
White	10,557,900	8,877,500	7,913,200	964,300	147,600	1,532,800	918,300	614,500
Black	640,200	555,600	509,300	46,300	14,300	70,300	40,700	29,500
Hispanic	422,200	371,500	333,600	37,900	9,700	41,000	13,500	27,500
Asian	849,400	745,600	688,500	57,100	19,000	84,800	30,000	54,800
Other	42,400	35,400	32,100	3,300	1,300	5,700	2,500	3,200
S&E occupations, total	3,899,000	3,369,400	3,105,000	264,400	52,900	476,600	334,300	142,300
White	3,260,200	2,791,900	2,561,500	230,400	40,500	427,800	312,400	115,400
Black	126,600	113,000	105,500	7,500	2,200	11,400	5,100	6,200
Hispanic	114,900	103,500	95,200	8,200	2,700	8,700	4,300	4,300
Asian	384,700	349,800	332,200	17,600	7,100	27,800	12,100	15,700
Other	12,600	11,300	10,600	700	400	900	300	600
Scientists, total	2,261,500	1,995,100	1,791,000	204,000	30,000	236,400	126,000	110,500
White	1,881,900	1,654,600	1,476,100	178,500	22,600	204,800	115,600	89,200
Black	88,300	77,500	71,400	6,200	1,300	9,500	3,900	5,500
Hispanic	62,800	55,800	48,900	6,800	1,900	5,100	1,800	3,200
Asian	220,400	200,100	188,200	11,900	3,900	16,400	4,500	11,900
Other	8,100	7,100	6,400	600	300	700	100	600
Computer/math scientists, total	1,129,700	1,039,500	974,400	65,100	14,600	75,700	40,000	35,700
White	917,100	839,400	782,500	56,900	11,100	66,600	36,800	29,800
Black	48,000	44,900	42,900	1,900	500	2,600	1,100	1,600
Hispanic	28,200	26,200	24,600	1,600	800	1,200	300	900
Asian	133,600	126,600	121,900	4,600	2,000	5,000	1,700	3,400
Other	2,800	2,500	2,400	100	200	100	100	100
Life/related scientists, total	387,300	321,800	292,700	29,000	7,400	58,100	26,700	31,400
White	324,000	272,400	246,900	25,400	5,200	46,400	22,900	23,500
Black	11,400	7,700	7,300	500	400	3,200	1,500	1,700
Hispanic	10,700	8,000	7,300	700	400	2,400	800	1,600
Asian	39,700	32,300	30,000	2,400	1,300	6,000	1,400	4,600
Other	1,500	1,400	1,300	100	S	100	S	100
Physical/related scientists, total	343,500	284,900	259,500	25,300	4,600	54,100	37,000	17,200
White	292,100	240,200	218,400	21,800	3,200	48,700	34,900	13,800
Black	10,000	8,400	7,900	400	100	1,500	800	800
Hispanic	8,800	7,200	6,600	700	700	900	400	500
Asian	31,400	27,900	25,700	2,200	500	3,000	900	2,200
Other	1,200	1,200	1,000	200	100	S	S	S
Social/related scientists, total	401,000	349,000	264,400	84,500	3,500	48,500	22,300	26,200
White	348,800	302,600	228,300	74,300	3,000	43,200	21,000	22,100
Black	18,900	16,500	13,200	3,300	300	2,100	600	1,500
Hispanic	15,100	14,400	10,500	3,900	100	600	200	400
Asian	15,700	13,300	10,600	2,700	S	2,300	500	1,800
Other	2,500	2,100	1,700	300	S	400	S	400
Engineers, total	1,637,500	1,374,400	1,314,000	60,400	22,900	240,200	208,400	31,800
White	1,378,300	1,137,300	1,085,400	51,900	17,900	223,000	196,800	26,200
Black	38,300	35,400	34,100	1,300	900	1,900	1,200	700
Hispanic	52,100	47,700	46,300	1,400	800	3,600	2,500	1,100
Asian	164,400	149,700	144,000	5,700	3,200	11,500	7,700	3,800
Other	4,500	4,200	4,100	100	100	200	200	S

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-13.
U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and employment status: 1997

Occupation and race/ethnicity	S&Es, total	Employed			Unemployed/seeking job	Not in labor force		
		Total	Full-time	Part-time		Total	Retired	Not seeking job
Non-S&E occupations, total	8,613,100	7,216,200	6,371,600	844,600	138,900	1,257,900	670,700	587,200
White	7,297,700	6,085,600	5,351,700	734,000	107,100	1,105,000	605,900	499,100
Black	513,600	442,600	403,800	38,800	12,100	58,900	35,600	23,300
Hispanic	307,300	268,000	238,300	29,700	6,900	32,400	9,200	23,200
Asian	464,700	395,800	356,300	39,600	11,900	57,000	17,900	39,100
Other	29,800	24,100	21,500	2,600	1,000	4,700	2,200	2,500
Managers/administrators	2,321,300	2,019,900	1,941,100	78,800	29,100	272,300	212,000	60,300
White	2,006,300	1,735,100	1,665,200	70,000	23,000	248,200	195,400	52,800
Black	126,500	112,900	110,000	2,900	2,600	11,000	9,800	1,200
Hispanic	68,800	64,000	62,200	1,800	600	4,200	2,000	2,200
Asian	112,800	102,500	98,800	3,700	2,800	7,500	4,100	3,400
Other	6,800	5,400	5,000	400	S	1,400	800	600
Other non-S&E occupations	6,291,800	5,196,300	4,430,500	765,700	109,800	985,700	458,800	526,900
White	5,291,300	4,350,500	3,686,500	664,000	84,100	856,800	410,500	446,300
Black	387,100	329,700	293,800	35,900	9,400	47,900	25,800	22,100
Hispanic	238,500	204,000	176,200	27,800	6,300	28,100	7,200	20,900
Asian	351,900	293,400	257,500	35,900	9,100	49,500	13,800	35,700
Other	23,000	18,700	16,500	2,200	900	3,300	1,400	1,900
		Bachelor's						
All occupations, total	7,456,800	6,193,700	5,545,400	648,300	123,600	1,139,500	604,800	534,700
White	6,314,700	5,212,700	4,649,200	563,500	93,300	1,008,700	559,700	449,000
Black	399,700	345,000	319,100	25,900	10,700	44,000	20,400	23,600
Hispanic	272,600	237,700	213,300	24,500	6,500	28,400	6,300	22,100
Asian	441,200	374,900	342,500	32,300	12,200	54,100	17,000	37,100
Other	28,700	23,400	21,200	2,200	1,000	4,300	1,400	2,900
S&E occupations, total	2,252,100	1,916,800	1,794,800	122,000	31,800	303,500	214,100	89,400
White	1,932,200	1,631,800	1,523,600	108,300	24,300	276,100	202,500	73,700
Black	82,100	72,600	69,300	3,300	1,700	7,800	3,300	4,400
Hispanic	69,300	62,200	58,200	4,000	1,800	5,400	2,000	3,400
Asian	160,400	143,200	137,100	6,100	3,800	13,500	6,100	7,300
Other	8,100	7,000	6,700	400	300	800	200	600
Scientists, total	1,135,500	1,000,200	915,400	84,800	16,700	118,600	52,300	66,300
White	960,000	846,300	771,600	74,700	11,900	101,800	48,400	53,400
Black	53,400	46,200	43,700	2,500	1,000	6,200	2,200	4,000
Hispanic	33,600	29,400	25,900	3,500	1,300	2,900	400	2,400
Asian	83,700	74,200	70,500	3,800	2,200	7,300	1,300	6,000
Other	4,800	4,000	3,700	300	300	500	S	500
Computer/math scientists, total	731,900	675,300	639,100	36,200	10,500	46,000	21,000	25,000
White	615,700	566,600	533,500	33,000	8,000	41,100	19,200	22,000
Black	35,400	33,100	32,300	800	300	1,900	900	1,100
Hispanic	19,600	18,100	17,200	900	700	700	100	600
Asian	59,200	55,800	54,500	1,400	1,200	2,200	900	1,300
Other	2,000	1,700	1,700	100	200	100	S	100
Life/related scientists, total	158,100	125,200	111,400	13,800	3,100	29,900	8,700	21,200
White	134,300	110,000	97,700	12,300	1,500	22,800	7,600	15,200
Black	5,700	3,000	2,800	200	400	2,300	700	1,600
Hispanic	5,300	3,300	2,900	400	300	1,600	300	1,300
Asian	11,800	8,000	7,000	900	800	3,000	100	2,900
Other	1,000	900	900	S	S	100	S	100

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-13.
U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and employment status: 1997

Occupation and race/ethnicity	S&Es, total	Employed			Unemployed/seeking job	Not in labor force		
		Total	Full-time	Part-time		Total	Retired	Not seeking job
Physical/related scientists, total	163,300	131,700	118,200	13,500	2,400	29,200	18,800	10,400
White	142,000	114,000	102,000	12,000	1,800	26,200	17,900	8,300
Black	6,700	5,500	5,200	300	S	1,100	600	500
Hispanic	4,500	3,900	3,400	500	200	400	S	400
Asian	9,600	7,900	7,200	700	200	1,500	300	1,200
Other	500	400	300	100	100	S	S	S
Social/related scientists, total	82,200	68,000	46,700	21,300	800	13,500	3,700	9,700
White	68,000	55,800	38,400	17,400	500	11,700	3,700	7,900
Black	5,600	4,600	3,400	1,300	200	800	S	800
Hispanic	4,300	4,200	2,400	1,800	S	100	S	100
Asian	3,100	2,500	1,700	800	S	600	S	600
Other	1,300	900	800	100	S	300	S	300
Engineers, total	1,116,600	916,600	879,400	37,200	15,100	184,900	161,800	23,000
White	972,200	785,600	752,000	33,600	12,300	174,400	154,100	20,300
Black	28,700	26,300	25,600	700	700	1,600	1,100	400
Hispanic	35,700	32,800	32,300	500	500	2,500	1,600	900
Asian	76,700	68,900	66,600	2,300	1,500	6,200	4,900	1,400
Other	3,200	3,000	3,000	100	S	200	200	S
Non-S&E occupations, total	5,204,700	4,276,900	3,750,600	526,300	91,800	836,000	390,700	445,300
White	4,382,400	3,580,900	3,125,700	455,200	69,000	732,500	357,200	375,300
Black	317,600	272,400	249,800	22,600	8,900	36,300	17,100	19,200
Hispanic	203,300	175,500	155,100	20,500	4,700	23,000	4,300	18,700
Asian	280,800	231,700	205,500	26,200	8,400	40,600	10,900	29,700
Other	20,600	16,400	14,600	1,800	700	3,600	1,200	2,300
Managers/administrators	1,319,600	1,141,100	1,095,300	45,800	14,200	164,300	129,800	34,500
White	1,152,100	990,500	949,700	40,800	10,200	151,400	121,500	29,900
Black	65,300	58,500	57,300	1,200	1,700	5,000	4,500	500
Hispanic	41,600	38,900	37,500	1,400	200	2,500	900	1,700
Asian	56,200	49,800	47,800	2,000	2,000	4,400	2,500	1,900
Other	4,400	3,400	3,100	300	S	1,000	400	600
Other non-S&E occupations	3,885,100	3,135,800	2,655,300	480,600	77,600	671,700	260,900	410,800
White	3,230,400	2,590,300	2,176,000	414,400	58,900	581,200	235,700	345,500
Black	252,300	213,900	192,500	21,400	7,200	31,300	12,600	18,700
Hispanic	161,600	136,700	117,600	19,100	4,500	20,500	3,500	17,000
Asian	224,600	181,900	157,700	24,200	6,400	36,200	8,400	27,900
Other	16,200	13,000	11,400	1,600	700	2,500	800	1,700
Master's								
All occupations, total	3,311,300	2,819,800	2,503,300	316,500	52,200	439,300	289,600	149,700
White	2,756,700	2,330,500	2,056,700	273,700	41,400	384,900	259,100	125,800
Black	176,100	151,300	136,600	14,700	2,900	21,900	16,900	5,000
Hispanic	99,600	88,100	79,000	9,100	2,700	8,800	4,800	3,900
Asian	270,000	242,000	223,900	18,100	4,800	23,200	8,400	14,800
Other	8,800	7,900	7,000	900	300	700	500	200
S&E occupations, total	1,100,000	967,900	863,800	104,100	14,000	118,200	76,300	41,900
White	883,800	770,200	681,900	88,300	10,700	102,900	70,200	32,700
Black	33,400	30,000	26,500	3,500	400	3,100	1,400	1,700
Hispanic	31,900	29,300	26,200	3,100	700	1,900	1,200	800
Asian	148,100	135,800	126,700	9,100	2,100	10,200	3,500	6,800
Other	2,800	2,700	2,500	200	100	100	S	100

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-13.
U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and employment status: 1997

Occupation and race/ethnicity	S&Es, total	Employed			Unemployed/seeking job	Not in labor force		
		Total	Full-time	Part-time		Total	Retired	Not seeking job
Scientists, total	671,100	592,000	507,400	84,600	7,200	71,900	37,700	34,200
White	542,700	475,100	402,000	73,100	5,600	62,000	34,600	27,500
Black	24,900	21,900	19,100	2,900	300	2,700	1,300	1,400
Hispanic	17,500	16,000	13,700	2,300	400	1,100	500	600
Asian	84,300	77,400	71,200	6,100	900	6,000	1,300	4,700
Other	1,700	1,700	1,500	200	S	100	S	100
Computer/math scientists, total	328,500	301,600	277,400	24,200	3,100	23,800	14,600	9,200
White	249,000	226,400	206,300	20,000	2,200	20,400	13,800	6,600
Black	11,200	10,300	9,500	800	100	700	200	500
Hispanic	6,600	6,300	5,800	500	100	200	S	200
Asian	61,100	57,900	55,200	2,800	600	2,500	600	2,000
Other	600	600	600	S	S	S	S	S
Life/related scientists, total	83,800	70,300	61,700	8,500	1,200	12,400	5,700	6,600
White	69,900	59,400	52,100	7,400	1,000	9,500	4,300	5,100
Black	3,300	2,500	2,300	200	S	800	800	S
Hispanic	1,700	1,400	1,300	200	S	300	100	200
Asian	8,600	6,700	5,900	800	100	1,800	500	1,300
Other	200	200	100	100	S	S	S	S
Physical/related scientists, total	83,300	69,100	61,800	7,300	1,000	13,100	8,200	4,900
White	70,000	57,700	51,700	6,000	500	11,800	7,700	4,100
Black	1,900	1,500	1,400	100	S	400	100	200
Hispanic	2,200	1,600	1,500	200	300	300	200	S
Asian	8,700	7,900	6,800	1,100	200	600	100	500
Other	500	500	400	S	S	S	S	S
Social/related scientists, total	175,600	151,100	106,500	44,600	2,000	22,600	9,200	13,400
White	153,800	131,600	91,900	39,700	1,800	20,300	8,700	11,600
Black	8,500	7,500	5,800	1,800	100	800	200	600
Hispanic	7,000	6,600	5,100	1,500	S	300	200	200
Asian	5,900	4,800	3,300	1,500	S	1,100	100	900
Other	500	400	400	100	S	S	S	S
Engineers, total	428,900	375,900	356,300	19,500	6,800	46,300	38,500	7,700
White	341,100	295,100	279,900	15,200	5,100	40,800	35,700	5,200
Black	8,500	8,100	7,500	600	100	300	100	300
Hispanic	14,400	13,300	12,500	800	300	800	700	200
Asian	63,800	58,400	55,500	2,900	1,200	4,300	2,100	2,100
Other	1,100	1,000	1,000	S	100	S	S	S
Non-S&E occupations, total	2,211,300	1,851,900	1,639,600	212,400	38,100	321,200	213,400	107,800
White	1,872,900	1,560,300	1,374,900	185,400	30,600	282,000	188,900	93,200
Black	142,600	121,400	110,100	11,200	2,500	18,800	15,500	3,300
Hispanic	67,700	58,900	52,900	6,000	2,000	6,800	3,700	3,100
Asian	121,900	106,200	97,200	9,000	2,800	12,900	4,900	8,000
Other	6,000	5,200	4,500	700	300	600	500	100
Managers/administrators	826,600	724,800	698,500	26,300	13,300	88,400	65,700	22,800
White	705,400	613,900	590,900	23,000	12,000	79,500	59,100	20,300
Black	50,600	44,700	43,600	1,200	600	5,300	4,600	600
Hispanic	23,000	21,600	21,100	400	200	1,300	900	300
Asian	45,900	43,000	41,500	1,500	500	2,400	1,000	1,400
Other	1,800	1,700	1,500	200	S	100	S	100

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-13.
U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and employment status: 1997

Occupation and race/ethnicity	S&Es, total	Employed			Unemployed/seeking job	Not in labor force		
		Total	Full-time	Part-time		Total	Retired	Not seeking job
Other non-S&E occupations	1,384,700	1,127,100	941,000	186,100	24,800	232,700	147,700	85,000
White	1,167,600	946,400	784,000	162,400	18,600	202,600	129,700	72,800
Black	92,000	76,600	66,600	10,100	1,800	13,500	10,800	2,700
Hispanic	44,700	37,300	31,800	5,600	1,800	5,600	2,800	2,800
Asian	76,100	63,200	55,700	7,500	2,300	10,500	3,900	6,600
Other	4,300	3,500	2,900	500	200	500	500	100
Doctorate								
All occupations, total	789,700	696,000	637,400	58,700	9,700	83,900	67,700	16,200
White	642,800	562,200	511,000	51,200	7,400	73,200	59,800	13,400
Black	24,500	21,300	20,100	1,300	600	2,600	2,200	400
Hispanic	21,600	19,100	17,200	1,900	300	2,200	1,600	600
Asian	98,100	91,100	87,000	4,100	1,500	5,400	3,700	1,700
Other	2,700	2,200	2,100	200	S	500	400	S
S&E occupations, total	511,900	454,700	418,900	35,800	6,300	50,900	41,300	9,600
White	413,700	363,600	332,000	31,600	4,800	45,300	37,500	7,900
Black	10,200	9,600	8,900	700	100	500	300	100
Hispanic	12,100	10,700	9,900	900	300	1,100	900	200
Asian	74,200	69,200	66,800	2,400	1,100	3,800	2,500	1,300
Other	1,700	1,600	1,400	200	S	100	100	S
Scientists, total	422,700	375,300	342,800	32,400	5,300	42,100	33,500	8,600
White	351,300	309,100	280,400	28,700	4,400	37,800	30,500	7,300
Black	9,100	8,600	7,800	700	100	500	300	100
Hispanic	10,300	9,300	8,400	800	200	800	600	200
Asian	50,400	46,900	44,900	2,000	600	2,800	1,900	1,000
Other	1,600	1,400	1,300	200	S	100	100	S
Computer/math scientists, total	64,800	59,000	54,500	4,500	1,000	4,900	3,900	1,000
White	48,800	43,800	40,300	3,500	800	4,200	3,400	900
Black	1,100	1,100	800	300	S	S	S	S
Hispanic	1,900	1,600	1,400	100	S	300	200	S
Asian	12,800	12,300	11,800	500	200	300	200	100
Other	200	200	200	S	S	100	100	S
Life/related scientists, total	128,400	111,800	105,500	6,300	2,400	14,200	10,900	3,200
White	105,300	90,700	85,300	5,400	2,000	12,700	9,900	2,700
Black	1,900	1,800	1,700	100	S	100	S	100
Hispanic	2,800	2,600	2,400	200	S	200	100	100
Asian	18,000	16,500	15,900	600	300	1,200	800	400
Other	300	300	300	S	S	S	S	S
Physical/related scientists, total	96,100	83,700	79,200	4,500	1,200	11,200	9,500	1,700
White	79,300	68,200	64,300	3,900	900	10,200	8,800	1,400
Black	1,400	1,400	1,300	100	S	S	S	S
Hispanic	2,100	1,700	1,700	100	100	200	200	S
Asian	13,100	12,100	11,600	500	100	800	500	300
Other	300	200	200	S	S	S	S	S
Social/related scientists, total	133,300	120,800	103,600	17,200	800	11,800	9,200	2,600
White	117,800	106,400	90,500	15,900	700	10,800	8,400	2,300
Black	4,700	4,400	4,100	300	S	300	300	100
Hispanic	3,500	3,300	2,900	400	S	200	100	100
Asian	6,500	5,900	5,500	400	S	500	400	100
Other	800	700	600	200	S	S	S	S

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-13.
U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and employment status: 1997

Occupation and race/ethnicity	S&Es, total	Employed			Unemployed/seeking job	Not in labor force		
		Total	Full-time	Part-time		Total	Retired	Not seeking job
Engineers, total	89,200	79,400	76,100	3,300	1,000	8,800	7,800	900
White	62,500	54,500	51,600	2,900	400	7,500	6,900	600
Black	1,100	1,100	1,100	S	S	S	S	S
Hispanic	1,800	1,500	1,400	100	S	300	200	S
Asian	23,800	22,300	21,900	400	500	1,000	700	300
Other	100	100	100	S	S	S	S	S
Non-S&E occupations, total	277,800	241,300	218,400	22,900	3,400	33,100	26,400	6,700
White	229,100	198,700	179,000	19,600	2,600	27,800	22,300	5,500
Black	14,300	11,700	11,200	500	500	2,200	1,900	300
Hispanic	9,500	8,400	7,400	1,000	S	1,100	700	400
Asian	23,900	21,900	20,200	1,700	300	1,600	1,200	400
Other	1,000	700	700	S	S	300	300	S
Managers/administrators	115,300	102,400	98,300	4,100	1,200	11,700	10,600	1,100
White	97,000	85,700	81,800	3,900	800	10,400	9,400	1,000
Black	5,900	5,200	5,100	100	300	500	500	S
Hispanic	2,500	2,400	2,400	S	S	100	100	S
Asian	9,300	8,800	8,700	100	S	400	400	S
Other	600	200	200	S	S	300	300	S
Other non-S&E occupations	162,500	138,900	120,200	18,800	2,200	21,300	15,800	5,600
White	132,100	112,900	97,200	15,700	1,700	17,500	13,000	4,500
Black	8,400	6,500	6,100	500	200	1,700	1,400	300
Hispanic	7,000	6,000	5,000	1,000	S	1,000	600	400
Asian	14,600	13,100	11,500	1,600	300	1,200	800	400
Other	400	400	400	S	S	S	S	S

S = suppressed for reasons of confidentiality and/or data reliability

[a]Includes professional degrees.

[b]Total excludes 18,700 individuals who reported never having worked. For unemployed individuals, occupation is for their previous reported job.

NOTES: The term "Scientists and Engineers" (S&Es) includes all people who have ever received a bachelor's degree or higher in an S&E field, plus people holding a non-S&E bachelor's or higher degree who were employed in an S&E occupation during the 1993, 1995, or 1997 SESTAT surveys. Figures are rounded to nearest hundred. Details may not add to total because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See page 3-12 in Volume 1.

Appendix table 3-14.
Employed U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and years since degree: 1997

Occupation and race/ethnicity	Employed S&Es, total	Years since degree							
		<5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
				All degree levels[a]					
All occupations, total	10,585,600	1,892,900	1,742,500	1,726,000	1,616,600	1,548,200	1,033,900	523,600	501,800
White	8,877,500	1,480,400	1,429,800	1,443,200	1,367,400	1,337,500	903,500	458,900	456,800
Black	555,600	113,700	98,100	95,500	86,400	86,100	45,200	15,500	15,000
Hispanic	371,500	105,200	69,400	64,800	55,400	40,900	17,800	10,000	8,000
Asian	745,600	182,900	139,700	116,700	103,200	79,000	64,800	38,400	20,900
Other	35,400	10,700	5,600	5,800	4,200	4,800	2,600	700	1,000
S&E occupations, total	3,369,400	679,300	624,800	610,300	499,400	391,500	275,600	152,300	136,200
White	2,791,900	512,100	496,100	511,000	432,600	341,900	241,200	132,600	124,400
Black	113,000	28,200	25,500	21,600	15,200	12,600	5,800	2,400	1,600
Hispanic	103,500	30,700	23,100	19,800	11,800	8,600	4,600	3,000	2,000
Asian	349,800	104,400	78,300	56,300	38,200	27,600	23,300	14,200	7,500
Other	11,300	3,900	1,800	1,600	1,600	800	700	200	700
Scientists, total	1,995,100	428,100	383,000	363,400	292,600	239,300	156,700	76,800	55,100
White	1,654,600	325,000	304,300	301,800	254,600	211,700	139,900	67,200	50,200
Black	77,500	18,500	17,300	16,100	9,400	9,100	4,200	2,200	800
Hispanic	55,800	17,700	13,300	10,100	6,000	4,700	2,300	900	800
Asian	200,100	64,200	47,100	34,200	21,600	13,500	10,000	6,400	3,100
Other	7,100	2,800	1,000	1,100	1,100	400	400	100	200
Computer/math scientists, total	1,039,500	190,400	211,700	220,000	156,800	125,100	81,700	35,300	18,600
White	839,400	134,100	164,200	177,600	133,900	109,900	72,200	30,900	16,600
Black	44,900	9,600	9,900	10,700	4,700	5,200	2,700	1,600	500
Hispanic	26,200	6,700	6,200	5,800	3,300	2,600	1,000	300	300
Asian	126,600	39,500	30,800	25,400	14,400	7,400	5,400	2,500	1,100
Other	2,500	500	500	500	600	S	300	S	100
Life/related scientists, total	321,800	73,100	62,900	45,300	46,600	40,100	25,900	15,700	12,200
White	272,400	57,000	52,100	38,100	40,900	36,000	23,200	13,800	11,200
Black	7,700	2,100	1,500	1,500	1,100	900	300	200	200
Hispanic	8,000	2,400	2,200	1,200	800	200	700	200	200
Asian	32,300	10,800	7,100	4,300	3,500	2,800	1,700	1,500	600
Other	1,400	900	100	200	100	100	S	S	S
Physical/related scientists, total	284,900	62,600	52,300	43,500	39,000	29,500	26,900	14,700	16,200
White	240,200	50,900	40,900	36,700	34,700	26,100	23,700	12,200	14,900
Black	8,400	1,600	2,800	1,500	1,100	500	600	200	100
Hispanic	7,200	2,000	2,200	1,400	300	700	200	200	200
Asian	27,900	7,700	6,200	3,600	2800	2100	2300	2200	1000
Other	1,200	400	200	300	100	S	100	S	S
Social/related scientists, total	349,000	101,900	56,100	54,600	50,300	44,600	22,200	11,100	8,000
White	302,600	83,000	47,000	49,400	45,100	39,600	20,800	10,300	7,400
Black	16,500	5,100	3,100	2,500	2,600	2,400	500	300	100
Hispanic	14,400	6,700	2,700	1,700	1,600	1,100	400	200	100
Asian	13,300	6,100	3,100	900	900	1,200	600	300	400
Other	2,100	1,100	200	200	200	300	S	100	S
Engineers, total	1,374,400	251,200	241,800	246,900	206,800	152,200	118,800	75,500	81,200
White	1,137,300	187,100	191,800	209,200	178,000	130,200	101,300	65,400	74,200
Black	35,400	9,800	8,200	5,500	5,800	3,600	1,600	200	700
Hispanic	47,700	13,000	9,800	9,600	5,800	3,900	2,300	2,000	1,300
Asian	149,700	40,200	31,200	22,100	16,600	14,100	13,300	7,900	4,400
Other	4,200	1,100	800	500	500	400	200	100	500

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-14.
Employed U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and years since degree: 1997

Occupation and race/ethnicity	Employed S&Es, total	Years since degree: <5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
Non-S&E occupations, total	7,216,200	1,213,600	1,117,700	1,115,700	1,117,200	1,156,700	758,300	371,400	365,500
White	6,085,600	968,300	933,600	932,200	934,800	995,600	662,300	326,400	332,400
Black	442,600	85,500	72,700	73,800	71,200	73,400	39,400	13,100	13,400
Hispanic	268,000	74,500	46,300	45,000	43,600	32,300	13,200	7,100	6,000
Asian	395,800	78,500	61,400	60,400	65,000	51,400	41,500	24,200	13,400
Other	24,100	6,800	3,700	4,200	2,600	4,000	1,900	600	300
Managers/administrators	2,019,900	189,500	257,900	329,400	353,000	390,100	258,700	130,200	111,100
White	1,735,100	150,700	216,800	277,000	298,300	337,500	232,800	119,300	102,800
Black	112,900	12,500	16,300	19,500	22,400	25,200	10,400	3,100	3,400
Hispanic	64,000	11,100	10,000	13,900	12,300	9,900	4,200	1,700	1,100
Asian	102,500	14,400	14,100	17,800	19,400	16,200	10,800	5,900	3,900
Other	5,400	700	800	1,100	700	1,400	400	300	S
Other non-S&E occupations	5,196,300	1,024,100	859,800	786,300	764,200	766,600	499,700	241,200	254,400
White	4,350,500	817,600	716,800	655,200	636,500	658,100	429,500	207,100	229,600
Black	329,700	72,900	56,400	54,300	48,800	48,200	29,000	10,000	10,000
Hispanic	204,000	63,400	36,300	31,100	31,400	22,500	9,100	5,400	4,900
Asian	293,400	64,100	47,300	42,600	45,600	35,200	30,700	18,400	9,500
Other	18,700	6,100	3,000	3,100	1,900	2,600	1,500	300	300
Bachelor's									
All occupations, total	6,193,700	1,117,100	990,900	975,500	900,100	889,500	628,000	332,700	359,800
White	5,212,700	886,500	822,000	813,200	760,700	767,300	546,500	287,200	329,400
Black	345,000	70,300	60,600	60,900	51,000	51,900	28,800	11,000	10,500
Hispanic	237,700	70,000	43,900	38,500	35,700	25,200	11,400	7,200	5,700
Asian	374,900	82,500	61,300	59,000	50,400	41,700	39,600	26,800	13,600
Other	23,400	7,800	3,000	3,800	2,400	3,500	1,800	400	600
S&E occupations, total	1,916,800	344,100	347,800	376,200	295,300	215,000	152,500	89,700	96,200
White	1,631,800	273,100	288,400	320,800	258,600	190,500	133,500	77,600	89,300
Black	72,600	15,600	16,000	15,000	10,600	8,000	4,500	1,800	1,100
Hispanic	62,200	17,900	13,700	13,600	7,200	4,500	2,300	2,000	1,000
Asian	143,200	34,700	28,700	25,900	17,500	11,700	11,900	8,300	4,500
Other	7,000	2,800	1,000	800	1,400	400	300	100	300
Scientists, total	1,000,200	200,400	197,200	199,200	147,700	118,100	73,300	36,000	28,300
White	846,300	159,600	163,400	167,300	129,500	105,000	64,500	30,900	26,100
Black	46,200	9,700	10,300	10,100	5,500	5,400	3,100	1,600	500
Hispanic	29,400	9,300	7,600	6,200	2,700	2,000	1,000	300	200
Asian	74,200	19,800	15,600	15,100	9,100	5,600	4,500	3,200	1,400
Other	4,000	2,000	400	400	900	S	200	S	100
Computer/math scientists, total	675,300	102,700	132,100	159,300	104,400	86,100	53,400	24,200	13,200
White	566,600	79,100	107,900	132,600	90,200	76,700	46,800	21,100	12,100
Black	33,100	6,400	6,900	8,200	3,500	3,800	2,500	1,400	300
Hispanic	18,100	3,800	5,000	4,600	2,300	1,500	700	200	100
Asian	55,800	13,000	12,000	13,700	7,700	4,100	3,300	1,500	500
Other	1,700	400	300	200	600	S	100	S	100
Life/related scientists, total	125,200	32,700	26,300	14,900	17,800	14,200	8,100	6,600	4,700
White	110,000	27,200	23,500	12,600	16,500	12,500	7,500	6,000	4,300
Black	3,000	700	500	400	400	700	200	200	200
Hispanic	3,300	1,300	700	800	100	100	300	S	S
Asian	8,000	2,900	1,600	1,000	700	1,000	100	400	200
Other	900	600	100	100	100	S	S	S	S

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-14.
Employed U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and years since degree: 1997

Occupation and race/ethnicity	Employed S&Es, total	Years since degree: <5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
Physical/related scientists, total	131,700	31,400	25,900	19,400	19,700	11,500	10,200	4,700	8,900
White	114,000	27,000	21,300	17,100	18,200	10,100	8,800	3,200	8,300
Black	5,500	800	1,800	1,100	800	400	500	100	S
Hispanic	3,900	1,100	1,400	600	100	400	S	100	100
Asian	7,900	2,100	1,400	500	600	600	800	1,200	600
Other	400	200	S	100	S	S	100	S	S
Social/related scientists, total	68,000	33,700	12,900	5,700	5,800	6,200	1,700	600	1,500
White	55,800	26,200	10,700	5,000	4,600	5,700	1,400	600	1,500
Black	4,600	1,700	1,100	400	900	500	S	S	S
Hispanic	4,200	3,200	600	300	200	S	S	S	S
Asian	2,500	1,700	500	S	S	S	300	S	S
Other	900	800	S	S	100	S	S	S	S
Engineers, total	916,600	143,700	150,500	177,000	147,600	96,900	79,200	53,700	67,900
White	785,600	113,500	125,000	153,600	129,100	85,500	69,000	46,700	63,200
Black	26,300	5,900	5,800	4,900	5,100	2,600	1,400	100	600
Hispanic	32,800	8,500	6,000	7,400	4,500	2,400	1,300	1,700	900
Asian	68,900	14,900	13,100	10,800	8,400	6,100	7,400	5,100	3,100
Other	3,000	800	600	400	500	400	100	100	200
Non-S&E occupations, total	4,276,900	773,000	643,100	599,300	604,900	674,500	475,500	243,000	263,600
White	3,580,900	613,400	533,700	492,400	502,000	576,800	413,000	209,600	240,000
Black	272,400	54,600	44,500	45,900	40,400	43,900	24,300	9,300	9,400
Hispanic	175,500	52,200	30,300	24,900	28,500	20,700	9,100	5,200	4,700
Asian	231,700	47,800	32,600	33,100	32,900	30,000	27,600	18,500	9,200
Other	16,400	5,000	2,000	3,000	1,100	3,100	1,500	400	300
Managers/administrators	1,141,100	88,700	125,700	178,900	187,700	225,200	158,700	88,600	87,700
White	990,500	70,200	105,800	151,700	160,000	195,800	143,700	81,900	81,400
Black	58,500	5,400	6,800	10,300	11,100	14,200	6,700	1,500	2,600
Hispanic	38,900	5,900	5,400	7,900	8,000	6,500	2,700	1,300	1,100
Asian	49,800	6,900	7,300	8,300	8,300	7,500	5,200	3,700	2,600
Other	3,400	300	300	800	300	1,200	400	100	S
Other non-S&E occupations	3,135,800	684,300	517,400	420,400	417,200	449,400	316,900	154,400	175,900
White	2,590,300	543,200	427,900	340,700	342,000	381,000	269,300	127,700	158,600
Black	213,900	49,300	37,700	35,600	29,400	29,700	17,600	7,800	6,800
Hispanic	136,700	46,300	24,900	17,000	20,400	14,200	6,400	3,900	3,700
Asian	181,900	40,900	25,300	24,800	24,600	22,500	22,500	14,800	6,600
Other	13,000	4,700	1,700	2,300	800	1,900	1,100	300	300
Master's									
All occupations, total	2,819,800	543,700	501,400	474,400	450,600	413,000	260,300	110,800	65,600
White	2,330,500	415,900	406,600	394,900	376,600	352,000	226,800	99,800	58,000
Black	151,300	33,300	27,400	23,500	24,800	25,500	11,900	2,900	2,000
Hispanic	88,100	25,500	15,500	17,000	13,500	10,100	4,400	800	1,200
Asian	242,000	67,000	50,400	37,700	34,500	24,400	16,800	7,200	4,000
Other	7,900	2,000	1,500	1,300	1,200	900	400	100	300
S&E occupations, total	967,900	238,900	194,000	157,900	135,600	115,100	70,200	35,600	20,700
White	770,200	171,500	146,500	128,100	116,000	98,800	61,300	30,800	17,200
Black	30,000	10,100	7,000	4,200	3,300	3,600	800	500	400
Hispanic	29,300	10,000	6,300	4,300	3,000	3,100	1,300	400	800
Asian	135,800	46,600	33,500	20,700	13,200	9,500	6,600	3,800	1,900
Other	2,700	700	600	700	100	100	200	S	300

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-14.
Employed U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and years since degree: 1997

Occupation and race/ethnicity	Employed S&Es, total	Years since degree							
		<5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
Scientists, total	592,000	150,100	118,400	98,500	85,800	69,200	40,600	19,000	10,400
White	475,100	108,400	89,500	79,500	73,800	61,000	37,200	16,700	8,900
Black	21,900	6,500	4,900	3,700	2,700	2,800	600	400	300
Hispanic	16,000	5,900	2,900	2,400	2,000	1,900	500	100	300
Asian	77,400	28,800	20,600	12,400	7,300	3,400	2,300	1,700	800
Other	1,700	400	500	600	100	100	100	S	S
Computer/math scientists, total	301,600	73,600	68,700	51,800	43,600	31,400	20,500	8,300	3,800
White	226,400	46,300	49,400	38,700	36,300	27,000	18,300	7,200	3,100
Black	10,300	2,800	2,500	2,100	1,100	1,200	200	200	200
Hispanic	6,300	2,400	800	1,100	700	900	300	100	200
Asian	57,900	22,000	15,700	9,600	5,600	2,200	1,600	800	400
Other	600	S	200	300	S	S	100	S	S
Life/related scientists, total	70,300	17,100	14,500	10,400	10,700	9,300	4,700	2,500	1,000
White	59,400	13,200	11,900	8,600	9,000	9,200	4,400	2,100	1,000
Black	2,500	900	700	400	500	S	S	S	S
Hispanic	1,400	500	400	100	300	S	100	100	S
Asian	6,700	2,300	1,700	1,300	800	200	200	300	S
Other	200	200	S	S	S	S	S	S	S
Physical/related scientists, total	69,100	16,900	13,000	10,900	8,500	7,800	6,400	3,400	2,200
White	57,700	13,500	9,800	8,800	7,800	7,200	5,800	2,800	1,900
Black	1,500	500	600	100	200	S	100	100	S
Hispanic	1,600	500	300	500	100	100	S	S	100
Asian	7,900	2,300	2,100	1,300	500	400	500	500	200
Other	500	100	200	200	100	S	S	S	S
Social/related scientists, total	151,100	42,500	22,200	25,400	23,000	20,600	9,000	4,800	3,400
White	131,600	35,500	18,500	23,300	20,700	17,600	8,600	4,500	2,900
Black	7,500	2,300	1,100	1,000	900	1,600	300	200	100
Hispanic	6,600	2,500	1,400	700	1,000	900	100	S	100
Asian	4,800	2,100	1,200	200	400	500	100	100	300
Other	400	100	100	100	S	100	S	S	S
Engineers, total	375,900	88,800	75,600	59,400	49,700	45,900	29,600	16,600	10,300
White	295,100	63,000	57,000	48,600	42,200	37,800	24,100	14,100	8,300
Black	8,100	3,600	2,100	500	700	800	200	100	100
Hispanic	13,300	4,100	3,400	1,900	1,000	1,200	900	300	400
Asian	58,400	17,800	12,900	8,300	5,800	6,100	4,200	2,100	1,100
Other	1,000	300	100	100	100	S	100	S	300
Non-S&E occupations, total	1,851,900	304,900	307,400	316,400	315,000	298,000	190,100	75,200	44,900
White	1,560,300	244,400	260,000	266,800	260,600	253,300	165,500	68,900	40,700
Black	121,400	23,200	20,400	19,200	21,500	21,900	11,200	2,400	1,600
Hispanic	58,900	15,500	9,200	12,800	10,500	7,000	3,100	400	500
Asian	106,200	20,400	16,900	17,000	21,400	14,900	10,200	3,300	2,100
Other	5,200	1,400	900	700	1,100	800	200	100	S
Managers/administrators	724,800	84,900	116,200	125,400	134,200	136,600	77,200	33,600	16,800
White	613,900	67,600	97,800	104,600	112,200	117,600	68,200	30,100	15,800
Black	44,700	6,000	8,500	7,600	8,600	9,000	3,400	1,300	400
Hispanic	21,600	4,300	4,000	5,500	3,400	3,100	1,100	200	S
Asian	43,000	6,600	5,600	7,500	9,500	6,700	4,600	1,800	700
Other	1,700	400	300	200	400	200	S	100	S
Other non-S&E occupations	1,127,100	220,000	191,200	191,000	180,800	161,400	112,900	41,600	28,100
White	946,400	176,800	162,300	162,200	148,400	135,700	97,300	38,800	25,000
Black	76,600	17,200	11,900	11,600	12,800	12,900	7,800	1,100	1,200
Hispanic	37,300	11,200	5,300	7,300	7,100	3,900	2,000	200	500
Asian	63,200	13,800	11,300	9,500	11,900	8,200	5,700	1,600	1,400
Other	3,500	1,000	600	400	600	600	200	S	S

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-14.
Employed U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and years since degree: 1997

Occupation and race/ethnicity	Employed S&Es, total	Years since degree: <5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
Doctorate									
All occupations, total	696,000	127,900	116,300	108,600	99,400	93,400	85,300	39,500	25,600
White	562,200	92,400	87,300	88,200	81,200	79,100	75,400	35,300	23,200
Black	21,300	4,100	4,700	4,500	4,800	2,200	900	200	100
Hispanic	19,100	4,000	4,300	2,700	2,600	2,700	1,600	900	300
Asian	91,100	27,000	19,800	13,000	10,500	9,000	7,100	3,000	1,900
Other	2,200	500	400	200	300	400	200	100	S
S&E occupations, total	454,700	92,500	80,900	70,100	61,800	56,000	51,600	25,400	16,400
White	363,600	64,000	59,700	57,100	52,100	47,700	45,200	22,800	15,200
Black	9,600	2,400	2,400	1,800	1,300	1,000	600	100	100
Hispanic	10,700	2,700	2,800	1,600	1,200	1,100	1,000	300	200
Asian	69,200	23,000	15,800	9,500	7,100	6,000	4,700	2,100	900
Other	1,600	400	200	100	200	300	200	100	S
Scientists, total	375,300	74,200	65,400	60,000	53,100	46,800	41,700	20,200	13,800
White	309,100	53,900	50,000	50,200	46,000	40,900	37,000	18,200	12,800
Black	8,600	2,100	2,000	1,700	1,200	900	500	100	100
Hispanic	9,300	2,400	2,500	1,300	1,000	800	800	300	200
Asian	46,900	15,500	10,700	6,600	4,700	4,100	3,100	1,500	700
Other	1,400	400	200	100	200	200	200	100	S
Computer/math scientists, total	59,000	12,400	10,700	8,200	8,000	7,400	7,800	2,800	1,600
White	43,800	7,200	6,800	5,700	6,900	6,200	7,000	2,600	1,400
Black	1,100	200	400	100	100	100	100	S	S
Hispanic	1,600	500	400	200	300	300	S	S	S
Asian	12,300	4,500	3,100	2,200	800	900	600	200	200
Other	200	100	S	S	S	S	100	S	S
Life/related scientists, total	111,800	22,900	21,400	17,400	15,500	12,900	11,900	5,700	4,100
White	90,700	16,100	16,600	14,900	13,300	11,000	10,100	4,900	3,700
Black	1,800	500	300	300	200	200	200	S	S
Hispanic	2,600	600	900	200	200	100	300	100	200
Asian	16,500	5,600	3,500	1,900	1,800	1,500	1,400	800	100
Other	300	100	S	S	S	100	S	S	S
Physical/related scientists, total	83,700	14,100	13,500	13,200	10,600	10,100	10,300	6,700	5,100
White	68,200	10,200	9,900	10,800	8,700	8,700	9,100	6,100	4,800
Black	1,400	300	400	300	200	100	S	S	100
Hispanic	1,700	300	500	300	100	200	200	100	S
Asian	12,100	3,200	2,700	1,800	1,600	1,100	1,000	400	200
Other	200	100	S	S	100	S	S	S	S
Social/related scientists, total	120,800	24,800	19,900	21,200	19,000	16,400	11,600	5,000	3,000
White	106,400	20,300	16,800	18,800	17,300	14,900	10,800	4,600	2,900
Black	4,400	1,000	900	1,000	800	400	200	100	S
Hispanic	3,300	1,000	700	600	400	200	300	100	S
Asian	5,900	2,200	1,400	700	500	700	200	200	100
Other	700	200	100	100	100	200	S	100	S
Engineers, total	79,400	18,300	15,500	10,100	8,700	9,200	9,900	5,100	2,600
White	54,500	10,100	9,700	6,800	6,100	6,800	8,100	4,600	2,400
Black	1,100	300	400	100	100	100	100	S	S
Hispanic	1,500	300	300	200	200	300	100	S	S
Asian	22,300	7,500	5,100	3,000	2,300	1,900	1,600	600	300
Other	100	S	S	S	S	100	S	S	S

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-14.
Employed U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and years since degree: 1997

Occupation and race/ethnicity	Employed S&Es, total	Years since degree							
		<5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
Non-S&E occupations, total	241,300	35,500	35,400	38,500	37,600	37,400	33,700	14,100	9,100
White	198,700	28,500	27,600	31,100	29,100	31,500	30,200	12,600	8,100
Black	11,700	1,700	2,200	2,700	3,500	1,200	300	S	100
Hispanic	8,400	1,300	1,500	1,100	1,400	1,700	700	600	100
Asian	21,900	3,900	4,000	3,400	3,400	3,100	2,300	900	900
Other	700	100	200	100	200	S	100	S	S
Managers/administrators	102,400	9,800	12,300	14,500	18,600	21,000	16,800	6,200	3,100
White	85,700	7,700	9,900	11,200	14,700	18,400	15,300	5,700	2,700
Black	5,200	600	800	900	1,900	700	200	S	S
Hispanic	2,400	600	200	500	400	200	200	100	S
Asian	8,800	900	1,200	1,800	1,400	1,700	1,000	300	400
Other	200	S	S	100	S	S	100	S	S
Other non-S&E occupations	138,900	25,600	23,200	24,000	19,100	16,400	16,800	7,900	6,000
White	112,900	20,800	17,600	19,900	14,400	13,100	14,900	6,900	5,400
Black	6,500	1,100	1,400	1,800	1,600	500	200	S	S
Hispanic	6,000	700	1,200	600	1,000	1,400	500	500	100
Asian	13,100	3,000	2,800	1,700	1,900	1,400	1,300	500	500
Other	400	100	100	S	200	S	S	S	S

S = suppressed for reasons of confidentiality and/or data reliability

[a]Includes professional degrees.

NOTES: The term "Scientists and Engineers" (S&Es) includes all people who have ever received a bachelor's degree or higher in an S&E field, plus people holding a non-S&E bachelor's or higher degree who were employed in an S&E occupation during the 1993, 1995, or 1997 SESTAT surveys. Figures are rounded to nearest hundred. Details may not add to total because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See page 3-12 in Volume 1.

Appendix table 3-15.
Employed U.S. scientists and engineers, by highest degree attained, occupation, race or ethnicity, and employment sector: 1997

Occupation and race/ethnicity	Employed S&Es, total	Sector of employment: Business/ industry	4-yr. college/ university	Other educational institution	Government
All degree levels[a]					
All occupations, total	10,585,600	7,264,900	940,600	1,012,900	1,367,300
White	8,877,500	6,205,100	752,500	847,000	1,072,900
Black	555,600	279,600	49,700	90,000	136,300
Hispanic	371,500	227,700	38,400	44,000	61,400
Asian	745,600	532,900	95,700	27,900	89,100
Other	35,400	19,500	4,300	4,100	7,500
S&E occupations, total	3,369,400	2,343,600	475,700	111,000	439,100
White	2,791,900	1,955,600	386,200	96,700	353,300
Black	113,000	68,700	14,100	5,700	24,500
Hispanic	103,500	65,500	17,100	4,300	16,500
Asian	349,800	247,400	56,500	3,800	4,200
Other	11,300	6,300	1,900	400	2,800
Scientists, total	1,995,100	1,236,900	409,100	103,600	245,500
White	1,654,600	1,023,000	337,300	90,500	203,700
Black	77,500	44,200	12,000	5,300	16,100
Hispanic	55,800	29,400	14,800	4,100	7,500
Asian	200,100	137,200	43,200	3,300	16,300
Other	7,100	3,000	1,800	400	1,900
Computer/math scientists, total	1,039,500	828,900	88,200	33,000	89,400
White	839,400	669,300	71,400	28,000	70,700
Black	44,900	32,100	2,900	1,800	8,000
Hispanic	26,200	19,300	2,900	1,300	2,600
Asian	126,600	106,700	10,600	1,800	7,500
Other	2,500	1,500	400	S	600
Life/related scientists, total	321,800	102,700	139,100	15,400	64,600
White	272,400	88,200	114,100	13,800	56,300
Black	7,700	2,600	2,900	300	2,000
Hispanic	8,000	1,500	4,200	700	1,600
Asian	32,300	10,300	17,500	500	4,000
Other	1,400	100	400	100	700
Physical/related scientists, total	284,900	156,100	71,100	8,900	48,700
White	240,200	131,700	59,500	8,000	41,000
Black	8,400	4,200	1,300	200	2,600
Hispanic	7,200	3,700	2,300	100	1,200
Asian	27,900	16,100	7,700	500	3,600
Other	1,200	400	300	100	300
Social/related scientists, total	349,000	149,200	110,600	46,400	42,800
White	302,600	133,900	92,300	40,600	35,800
Black	16,500	5,200	4,800	3,100	3,500
Hispanic	14,400	4,900	5,500	2,000	2,000
Asian	13,300	4,100	7,400	500	1,300
Other	2,100	1,000	600	200	200
Engineers, total	1,374,400	1,106,700	66,700	7,400	193,600
White	1,137,300	932,600	48,900	6,200	149,600
Black	35,400	24,500	2,100	400	8,400
Hispanic	47,700	36,100	2,300	300	9,000
Asian	149,700	110,200	13,300	500	25,700
Other	4,200	3,200	100	S	900

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-15.
Employed U.S. scientists and engineers, by highest degree attained, occupation, race or ethnicity, and employment sector: 1997

Occupation and race/ethnicity	Employed S&Es, total	Sector of employment: Business/ industry	4-yr. college/ university	Other educational institution	Government
Non-S&E occupations, total	7,216,200	4,921,300	464,800	901,900	928,100
White	6,085,600	4,249,500	366,300	750,200	719,600
Black	442,600	210,900	35,600	84,300	111,800
Hispanic	268,000	162,200	21,300	39,600	44,800
Asian	395,800	285,500	39,200	24,000	47,100
Other	24,100	13,200	2,400	3,700	4,800
Managers/administrators	2,019,900	1,527,000	90,300	99,700	303,000
White	1,735,100	1,341,000	73,800	78,900	241,500
Black	112,900	55,200	10,300	13,400	33,900
Hispanic	64,000	44,000	2,700	3,800	13,500
Asian	102,500	83,800	3,300	3,000	12,400
Other	5,400	3,100	200	600	1,600
Other non-S&E occupations	5,196,300	3,394,300	374,500	802,300	625,200
White	4,350,500	2,908,500	292,500	671,400	478,100
Black	329,700	155,700	25,300	70,900	77,800
Hispanic	204,000	118,200	18,600	35,800	31,300
Asian	293,400	201,700	35,900	21,100	34,800
Other	18,700	10,200	2,200	3,100	3,200
Bachelor's					
All occupations, total	6,193,700	4,582,200	317,600	463,200	830,700
White	5,212,700	3,938,600	251,300	382,700	640,100
Black	345,000	193,900	19,200	40,900	91,000
Hispanic	237,700	156,500	17,300	23,200	40,700
Asian	374,900	279,200	27,800	14,400	53,500
Other	23,400	13,900	2,000	2,100	5,500
S&E occupations, total	1,916,800	1,497,700	130,700	25,100	263,300
White	1,631,800	1,292,300	108,300	21,100	210,100
Black	72,600	51,700	3,300	1,700	15,900
Hispanic	62,200	43,300	6,600	1,000	11,200
Asian	143,200	106,000	11,800	1,200	24,000
Other	7,000	4,400	600	100	2,000
Scientists, total	1,000,200	740,100	110,200	21,100	128,900
White	846,300	629,700	92,500	17,800	106,300
Black	46,200	33,000	2,500	1,300	9,300
Hispanic	29,400	18,500	5,900	900	4,200
Asian	74,200	56,900	8,700	1,000	7,700
Other	4,000	2,000	600	100	1,300
Computer/math scientists, total	675,300	571,700	31,100	10,600	61,900
White	566,600	482,800	26,800	8,600	48,400
Black	33,100	25,400	900	1,000	5,800
Hispanic	18,100	14,500	1,200	300	2,000
Asian	55,800	47,900	2,200	700	5,100
Other	1,700	1,100	S	S	600
Life/related scientists, total	125,200	49,300	36,600	4,600	34,700
White	110,000	44,700	30,900	4,200	30,200
Black	3,000	1,300	400	S	1,300
Hispanic	3,300	600	1,400	300	1,000
Asian	8,000	2,600	3,700	100	1,600
Other	900	S	300	S	600

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-15.
Employed U.S. scientists and engineers, by highest degree attained, occupation, race or ethnicity, and employment sector: 1997

Occupation and race/ethnicity	Employed S&Es, total	Sector of employment: Business/ industry	4-yr. college/ university	Other educational institution	Government
Physical/related scientists, total	131,700	87,300	20,600	1,300	22,400
White	114,000	76,000	17,800	1,200	19,000
Black	5,500	3,300	500	S	1,600
Hispanic	3,900	2,100	1,100	S	700
Asian	7,900	5,700	1,100	100	1,000
Other	400	200	100	S	100
Social/related scientists, total	68,000	31,800	21,700	4,600	9,900
White	55,800	26,200	17,000	3,900	8,700
Black	4,600	3,000	700	300	600
Hispanic	4,200	1,200	2,200	300	500
Asian	2,500	700	1,700	100	S
Other	900	700	200	100	S
Engineers, total	916,600	757,700	20,600	4,000	134,400
White	785,600	662,600	15,800	3,300	103,800
Black	26,300	18,600	800	400	6,600
Hispanic	32,800	24,800	800	100	7,100
Asian	68,900	49,200	3,200	300	16,300
Other	3,000	2,400	S	S	600
Non-S&E occupations, total	4,276,900	3,084,500	186,900	438,100	567,500
White	3,580,900	2,646,300	142,900	361,600	430,000
Black	272,400	142,300	15,900	39,200	75,100
Hispanic	175,500	113,300	10,600	22,200	29,500
Asian	231,700	173,200	15,900	13,200	29,400
Other	16,400	9,500	1,400	2,000	3,500
Managers/administrators	1,141,100	928,600	33,400	21,800	157,300
White	990,500	822,300	28,000	16,300	123,900
Black	58,500	33,000	3,100	3,400	19,200
Hispanic	38,900	28,800	1,300	700	8,000
Asian	49,800	42,500	900	1,300	5,000
Other	3,400	1,900	100	100	1,200
Other non-S&E occupations	3,135,800	2,155,800	153,500	416,300	410,200
White	2,590,300	1,824,000	115,000	345,400	306,100
Black	213,900	109,300	12,800	35,800	55,900
Hispanic	136,700	84,400	9,400	21,400	21,500
Asian	181,900	130,600	15,000	11,900	24,400
Other	13,000	7,500	1,300	1,900	2,300
Master's					
All occupations, total	2,819,800	1,736,000	219,300	492,100	372,500
White	2,330,500	1,444,400	172,400	416,000	297,700
Black	151,300	57,200	14,800	45,300	34,000
Hispanic	88,100	46,600	8,300	18,400	14,800
Asian	242,000	183,900	23,000	10,600	24,500
Other	7,900	3,800	700	1,900	1,500
S&E occupations, total	967,900	657,200	113,300	69,200	128,200
White	770,200	517,500	88,000	61,400	103,200
Black	30,000	14,100	5,000	3,300	7,500
Hispanic	29,300	18,600	3,600	2,800	4,200
Asian	135,800	105,500	16,300	1,300	12,700
Other	2,700	1,400	500	300	600

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-15.
Employed U.S. scientists and engineers, by highest degree attained, occupation, race or ethnicity, and employment sector: 1997

Occupation and race/ethnicity	Employed S&Es, total	Sector of employment: Business/ industry	4-yr. college/ university	Other educational institution	Government
Scientists, total	592,000	357,100	92,700	66,100	76,100
White	475,100	279,600	73,800	58,700	63,000
Black	21,900	8,700	4,200	3,300	5,700
Hispanic	16,000	8,200	2,700	2,700	2,400
Asian	77,400	60,000	11,500	1,100	4,700
Other	1,700	600	500	300	300
Computer/math scientists, total	301,600	228,400	29,500	20,000	23,700
White	226,400	166,400	23,100	17,800	19,000
Black	10,300	6,100	1,300	700	2,200
Hispanic	6,300	4,100	900	800	600
Asian	57,900	51,500	3,900	700	1,800
Other	600	300	300	S	S
Life/related scientists, total	70,300	22,500	23,500	7,600	16,600
White	59,400	19,200	18,300	6,900	15,000
Black	2,500	700	1,200	200	400
Hispanic	1,400	200	500	300	400
Asian	6,700	2,500	3,400	100	800
Other	200	S	100	100	S
Physical/related scientists, total	69,100	35,600	13,200	5,200	15,200
White	57,700	30,000	10,400	4,800	12,400
Black	1,500	400	200	100	800
Hispanic	1,600	1,100	200	100	300
Asian	7,900	3,900	2,300	200	1,500
Other	500	200	S	S	200
Social/related scientists, total	151,100	70,700	26,500	33,300	20,600
White	131,600	64,100	22,000	29,100	16,500
Black	7,500	1,500	1,400	2,400	2,300
Hispanic	6,600	2,800	1,100	1,500	1,100
Asian	4,800	2,200	1,900	200	600
Other	400	100	100	100	100
Engineers, total	375,900	300,100	20,600	3,100	52,100
White	295,100	238,000	14,200	2,700	40,200
Black	8,100	5,400	800	S	1,800
Hispanic	13,300	10,400	900	100	1,900
Asian	58,400	45,500	4,800	200	7,900
Other	1,000	800	S	S	200
Non-S&E occupations, total	1,851,900	1,078,700	106,000	422,900	244,300
White	1,560,300	926,800	84,400	354,500	194,500
Black	121,400	43,100	9,800	42,000	26,500
Hispanic	58,900	28,000	4,800	15,600	10,600
Asian	106,200	78,400	6,800	9,200	11,800
Other	5,200	2,400	200	1,600	900
Managers/administrators	724,800	506,500	30,100	63,600	124,600
White	613,900	439,800	23,300	50,300	100,500
Black	44,700	18,600	4,500	8,900	12,700
Hispanic	21,600	13,100	1,000	2,700	4,800
Asian	43,000	34,000	1,400	1,300	6,300
Other	1,700	900	S	400	400

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-15.
Employed U.S. scientists and engineers, by highest degree attained, occupation, race or ethnicity, and employment sector: 1997

Occupation and race/ethnicity	Employed S&Es, total	Sector of employment: Business/ industry	4-yr. college/ university	Other educational institution	Government
Other non-S&E occupations	1,127,100	572,200	75,800	359,300	119,700
White	946,400	487,000	61,100	304,300	94,100
Black	76,600	24,500	5,400	33,100	13,700
Hispanic	37,300	14,900	3,800	12,900	5,800
Asian	63,200	44,400	5,400	8,000	5,500
Other	3,500	1,500	200	1,200	600
Doctorate					
All occupations, total	696,000	289,100	302,000	39,800	65,100
White	562,200	228,600	246,500	32,200	54,800
Black	21,300	5,100	10,900	3,200	2,100
Hispanic	19,100	7,300	8,600	1,700	1,500
Asian	91,100	47,400	34,700	2,500	6,400
Other	2,200	600	1,200	200	300
S&E occupations, total	454,700	174,500	220,900	14,700	44,600
White	363,600	133,700	180,400	12,300	37,200
Black	9,600	2,300	5,600	600	1,100
Hispanic	10,700	3,000	6,400	500	900
Asian	69,200	35,000	27,700	1,300	5,200
Other	1,600	500	800	100	200
Scientists, total	375,300	127,200	195,400	14,500	38,100
White	309,100	103,200	161,500	12,100	32,300
Black	8,600	1,800	5,100	600	1,100
Hispanic	9,300	2,300	5,800	500	700
Asian	46,900	19,500	22,400	1,200	3,800
Other	1,400	400	700	100	200
Computer/math scientists, total	59,000	25,600	27,400	2,200	3,800
White	43,800	17,800	21,300	1,500	3,200
Black	1,100	300	700	100	S
Hispanic	1,600	500	800	200	S
Asian	12,300	6,900	4,500	400	500
Other	200	100	100	S	S
Life/related scientists, total	111,800	27,200	69,500	3,000	12,200
White	90,700	21,400	56,700	2,500	10,000
Black	1,800	300	1,100	100	300
Hispanic	2,600	500	1,800	100	200
Asian	16,500	4,900	9,700	400	1,600
Other	300	100	100	S	100
Physical/related scientists, total	83,700	33,100	37,300	2,400	10,800
White	68,200	25,600	31,300	2,000	9,300
Black	1,400	500	600	100	200
Hispanic	1,700	500	1,000	S	200
Asian	12,100	6,500	4,200	300	1,100
Other	200	100	200	S	S
Social/related scientists, total	120,800	41,400	61,200	6,800	11,400
White	106,400	38,500	52,100	6,000	9,700
Black	4,400	700	2,700	400	600
Hispanic	3,300	700	2,100	200	300
Asian	5,900	1,200	3,900	200	700
Other	700	200	400	100	100

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-15.
Employed U.S. scientists and engineers, by highest degree attained, occupation, race or ethnicity, and employment sector: 1997

Occupation and race/ethnicity	Employed S&Es, total	Sector of employment: Business/ industry	4-yr. college/ university	Other educational institution	Government
Engineers, total	79,400	47,200	25,500	300	6,500
White	54,500	30,500	18,900	200	4,900
Black	1,100	400	600	S	100
Hispanic	1,500	700	600	S	100
Asian	22,300	15,500	5,300	100	1,400
Other	100	100	S	S	S
Non-S&E occupations, total	241,300	114,700	81,100	25,100	20,500
White	198,700	94,900	66,100	20,000	17,600
Black	11,700	2,900	5,300	2,600	1,000
Hispanic	8,400	4,300	2,200	1,200	700
Asian	21,900	12,400	7,100	1,300	1,200
Other	700	100	400	100	S
Managers/administrators	102,400	55,200	22,700	11,200	13,300
White	85,700	45,700	19,200	9,300	11,500
Black	5,200	1,300	2,100	1,200	600
Hispanic	2,400	1,400	400	300	400
Asian	8,800	6,700	1,000	400	800
Other	200	100	100	S	S
Other non-S&E occupations	138,900	59,500	58,400	13,800	7,200
White	112,900	49,200	46,900	10,600	6,100
Black	6,500	1,600	3,200	1,400	400
Hispanic	6,000	2,900	1,800	900	300
Asian	13,100	5,700	6,100	800	400
Other	400	S	300	100	S

S = suppressed for reasons of confidentiality and/or data reliability

[a]Includes professional degrees. .

NOTES: The term "Scientists and Engineers" (S&Es) includes all people who have ever received a bachelor's degree or higher in an S&E field, plus people holding a non-S&E bachelor's or higher degree who were employed in an S&E occupation during the 1993, 1995, or 1997 SESTAT surveys. Figures are rounded to nearest hundred. Details may not add to total because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See page 3-13 in Volume 1.

Appendix table 3-16.
Median annual salaries of U.S. scientists and engineers, by highest degree attained, occupation, race or ethnicity, and employment sector: 1997
(Dollars)

Occupation and race/ethnicity	Employed S&Es, total	Sector of employment: Business/ industry	4-yr. college/ university	Other educational institution	Government
		All degree levels[a]			
All occupations, total	50,000	54,000	43,000	37,100	48,000
White	50,000	55,000	45,000	38,000	49,000
Black	40,000	42,000	37,500	36,400	41,000
Hispanic	44,000	48,000	37,600	36,000	44,000
Asian	50,000	52,000	38,000	35,000	48,000
Other	40,000	40,000	30,000	35,000	45,000
S&E occupations, total	55,000	58,000	44,500	43,000	52,000
White	55,000	59,000	45,000	43,000	53,000
Black	48,000	50,000	40,000	40,000	48,000
Hispanic	50,000	53,000	39,100	49,000	49,000
Asian	55,000	60,000	40,000	43,300	52,000
Other	49,000	50,000	25,000	S	50,000
Scientists, total	52,000	55,700	43,000	43,000	50,000
White	52,300	56,000	44,000	43,000	50,000
Black	46,000	48,000	40,000	39,000	45,000
Hispanic	48,000	51,000	39,000	49,000	45,000
Asian	53,000	58,000	38,000	39,000	46,400
Other	40,000	50,000	25,000	S	40,000
Computer/math scientists, total	56,000	58,000	45,000	43,000	52,000
White	56,800	59,100	45,000	42,000	53,000
Black	48,000	50,000	40,000	S	46,000
Hispanic	53,000	55,000	42,600	S	50,000
Asian	56,000	60,000	44,000	47,000	46,400
Other	54,000	66,000	S	S	S
Life/related scientists, total	44,000	48,000	40,000	42,000	44,000
White	45,000	46,000	42,000	42,000	45,000
Black	45,900	52,000	31,500	S	46,000
Hispanic	40,000	50,000	35,700	S	40,000
Asian	40,000	55,000	32,000	34,000	42,000
Other	27,900	S	25,000	S	38,000
Physical/related scientists, total	50,000	52,500	42,000	40,000	50,100
White	50,000	53,200	44,000	40,000	51,000
Black	42,000	42,000	37,000	S	45,000
Hispanic	41,300	42,000	35,800	S	43,800
Asian	50,000	55,000	36,000	S	49,200
Other					
Social/related scientists, total	45,000	40,000	45,000	45,000	50,000
White	45,000	42,000	45,000	45,000	50,000
Black	36,900	33,000	43,000	38,500	36,000
Hispanic	40,000	40,000	42,000	45,000	42,000
Asian	44,000	46,700	42,000	36,000	55,000
Other	30,000	25,000	40,000	S	S
Engineers, total	60,000	60,000	52,600	48,000	56,000
White	60,000	60,000	55,000	47,000	57,000
Black	52,000	52,000	44,000	S	52,000
Hispanic	54,000	55,000	41,000	S	54,000
Asian	58,000	60,000	47,000	S	55,000
Other	53,000	53,000	S	S	55,000

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-16.
Median annual salaries of U.S. scientists and engineers, by highest degree attained, occupation, race or ethnicity, and employment sector: 1997
(Dollars)

Occupation and race/ethnicity	Employed S&Es, total	Sector of employment: Business/ industry	4-yr. college/ university	Other educational institution	Government
Non-S&E occupations, total	46,000	50,000	42,000	36,000	44,400
White	48,000	51,000	43,500	36,000	45,000
Black	38,000	38,500	37,000	36,000	39,000
Hispanic	40,000	42,000	37,300	35,000	42,000
Asian	42,000	45,000	36,000	33,000	40,000
Other	36,000	35,000	30,000	35,000	45,000
Managers/administrators	62,000	66,000	55,000	53,200	54,500
White	64,000	68,000	55,000	54,000	55,000
Black	50,000	50,000	50,000	48,000	50,000
Hispanic	55,000	59,000	42,000	53,100	48,000
Asian	60,000	60,000	60,000	50,000	52,100
Other	50,900	59,000	S	S	46,000
Other non-S&E occupations	40,000	42,000	38,000	35,000	40,000
White	40,000	44,000	40,000	35,000	40,000
Black	35,000	35,000	35,000	33,500	35,700
Hispanic	36,000	35,000	35,000	33,000	38,000
Asian	38,700	40,000	35,000	32,000	37,000
Other	32,000	30,000	30,000	34,000	37,000
Bachelor's					
All occupations, total	45,000	48,000	30,000	29,000	42,500
White	45,500	50,000	30,000	29,000	43,500
Black	36,000	39,000	30,000	28,000	37,000
Hispanic	40,000	42,000	29,000	30,000	40,000
Asian	42,300	45,000	30,000	29,000	44,000
Other	35,000	35,000	S	26,200	40,000
S&E occupations, total	52,000	55,000	24,000	36,000	50,000
White	53,000	55,000	24,000	36,000	50,100
Black	47,500	48,000	25,000	S	48,000
Hispanic	49,500	50,000	22,000	S	48,000
Asian	50,000	50,000	26,000	S	50,400
Other	45,000	50,000	S	S	40,000
Scientists, total	50,000	52,000	23,000	36,000	45,000
White	50,000	53,000	22,000	36,000	46,000
Black	45,000	45,000	S	S	46,000
Hispanic	46,000	49,000	22,000	S	40,000
Asian	48,000	50,000	25,000	S	45,000
Other	31,600	40,000	S	S	S
Computer/math scientists, total	54,000	55,000	39,200	39,200	50,000
White	55,000	55,000	40,000	39,200	50,000
Black	47,000	48,000	S	S	46,000
Hispanic	50,000	52,400	S	S	48,000
Asian	50,000	52,000	S	S	46,000
Other	S	S	S	S	S
Life/related scientists, total	36,000	40,000	20,000	S	40,000
White	36,000	40,000	19,000	S	40,000
Black	46,000	S	S	S	S
Hispanic	33,000	S	S	S	S
Asian	35,000	S	24,000	S	S
Other	S	S	S	S	S

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-16.
Median annual salaries of U.S. scientists and engineers, by highest degree attained, occupation, race or ethnicity, and employment sector: 1997
(Dollars)

Occupation and race/ethnicity	Employed S&Es, total	Sector of employment: Business/ industry	4-yr. college/ university	Other educational institution	Government
Physical/related scientists, total	42,000	45,000	15,000	S	45,000
White	42,800	45,000	15,000	S	45,000
Black	41,000	41,000	S	S	S
Hispanic	34,000	34,000	S	S	S
Asian	40,000	41,000	S	S	S
Other	S	S	S	S	S
Social/related scientists, total	25,000	25,200	16,000	S	40,000
White	25,000	25,200	16,000	S	40,000
Black	27,500	S	S	S	S
Hispanic	22,500	S	S	S	S
Asian	S	S	S	S	S
Other	S	S	S	S	S
Engineers, total	55,000	56,000	38,000	42,000	55,000
White	56,700	58,000	43,000	S	55,000
Black	50,000	50,000	S	S	50,000
Hispanic	52,000	52,000	S	S	54,000
Asian	51,000	52,000	35,000	S	53,500
Other	53,000	52,700	S	S	S
Non-S&E occupations, total	40,000	42,000	33,000	29,000	39,000
White	40,000	45,000	34,000	29,000	40,000
Black	33,000	35,000	31,000	28,000	35,000
Hispanic	35,000	35,000	30,000	30,000	39,000
Asian	36,500	39,000	32,000	29,000	37,000
Other	31,000	30,000	S	26,500	40,000
Managers/administrators	56,000	60,000	47,000	38,000	50,000
White	60,000	60,000	48,400	36,000	50,000
Black	45,000	47,000	S	S	45,000
Hispanic	49,500	53,800	S	S	46,000
Asian	50,000	50,000	S	S	50,000
Other	46,000	55,000	S	S	S
Other non-S&E occupations	35,000	36,000	30,000	28,000	35,000
White	35,000	37,000	30,000	28,400	36,000
Black	30,000	30,000	28,000	27,100	33,000
Hispanic	30,200	30,000	29,000	29,500	36,000
Asian	35,000	36,000	32,000	28,000	36,000
Other	29,000	25,500	S	25,000	33,000
Master's					
All occupations, total	53,000	61,000	37,200	43,500	50,000
White	54,000	63,000	38,000	44,000	51,600
Black	45,000	50,000	36,000	43,000	45,000
Hispanic	50,000	55,000	34,300	43,000	48,000
Asian	55,000	60,000	34,000	40,000	51,000
Other	45,000	50,000	S	41,500	50,900
S&E occupations, total	59,000	63,000	33,000	45,000	54,000
White	60,000	64,000	34,800	45,000	54,000
Black	48,000	57,000	27,000	38,500	45,000
Hispanic	55,000	58,500	33,000	48,000	50,000
Asian	59,000	60,000	31,000	S	53,000
Other	50,000	55,000	S	S	S

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-16.
Median annual salaries of U.S. scientists and engineers, by highest degree attained, occupation, race or ethnicity, and employment sector: 1997
(Dollars)

Occupation and race/ethnicity	Employed S&Es, total	Sector of employment			
		Business/ industry	4-yr. college/ university	Other educational institution	Government
Scientists, total	54,000	60,000	33,000	45,000	50,000
White	54,000	61,000	34,000	45,000	51,000
Black	43,000	55,000	28,000	38,500	42,000
Hispanic	50,000	55,000	33,000	48,000	46,500
Asian	57,000	60,000	32,000	S	45,000
Other	42,000	S	S	S	S
Computer/math scientists, total	60,000	65,000	38,000	45,000	55,000
White	61,000	65,000	39,600	45,000	56,500
Black	52,000	59,500	S	S	50,000
Hispanic	59,500	63,200	S	S	S
Asian	60,000	61,000	39,000	S	S
Other	S	S	S	S	S
Life/related scientists, total	42,000	49,000	31,000	42,000	44,000
White	42,000	50,000	32,000	42,000	44,900
Black	39,000	S	S	S	S
Hispanic	33,000	S	S	S	S
Asian	39,000	45,000	28,000	S	S
Other	S	S	S	S	S
Physical/related scientists, total	51,000	58,000	30,000	41,000	51,000
White	52,000	60,000	32,600	41,000	52,000
Black	41,000	S	S	S	S
Hispanic	47,500	S	S	S	S
Asian	44,000	51,000	30,000	S	S
Other	S	S	S	S	S
Social/related scientists, total	41,100	40,000	30,000	45,000	46,000
White	42,000	40,000	29,300	46,000	48,000
Black	35,000	S	S	38,500	35,000
Hispanic	45,000	40,000	S	S	S
Asian	38,000	48,000	S	S	S
Other	S	S	S	S	S
Engineers, total	63,600	65,000	39,000	48,000	60,000
White	65,000	66,000	45,000	S	60,000
Black	58,000	60,000	S	S	56,000
Hispanic	58,500	60,000	S	S	53,000
Asian	60,000	61,000	30,000	S	56,600
Other	55,000	S	S	S	S
Non-S&E occupations, total	50,000	60,000	40,000	43,000	50,000
White	50,500	60,000	42,000	44,000	50,000
Black	44,000	45,000	39,000	43,000	45,700
Hispanic	46,000	54,000	36,000	42,000	46,300
Asian	50,000	52,000	41,000	38,000	48,000
Other	42,000	42,600	S	40,000	S
Managers/administrators	68,000	75,000	55,000	54,000	59,800
White	70,000	75,000	56,000	54,000	60,000
Black	54,700	55,000	46,000	50,000	55,800
Hispanic	60,000	66,000	S	53,100	54,500
Asian	65,000	70,000	S	S	56,000
Other	53,500	S	S	S	S

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-16.
Median annual salaries of U.S. scientists and engineers, by highest degree attained, occupation, race or ethnicity, and employment sector: 1997
(Dollars)

Occupation and race/ethnicity	Employed S&Es, total	Sector of employment: Business/ industry	4-yr. college/ university	Other educational institution	Government
Other non-S&E occupations	42,000	43,200	36,000	41,000	42,000
White	42,000	45,000	36,000	41,600	42,700
Black	40,000	35,000	35,000	40,000	40,000
Hispanic	39,000	39,000	32,000	39,000	45,000
Asian	42,000	45,000	39,000	37,500	42,900
Other	37,000	S	S	S	S
Doctorate					
All occupations, total	63,000	74,700	55,000	52,000	65,000
White	63,400	75,000	56,000	52,000	65,600
Black	54,000	65,000	50,000	58,700	58,000
Hispanic	55,000	67,800	51,000	51,000	53,000
Asian	65,000	72,000	50,000	50,000	60,000
Other	52,000	70,000	49,000	S	48,000
S&E occupations, total	62,000	72,700	54,000	49,200	63,400
White	62,000	75,000	55,000	49,000	65,000
Black	55,000	69,000	50,000	45,000	58,000
Hispanic	55,900	69,000	50,000	50,000	60,500
Asian	62,000	70,000	48,000	48,000	60,000
Other	50,000	70,000	48,500	S	48,000
Scientists, total	60,000	71,000	52,000	49,200	62,000
White	60,000	72,100	54,000	49,000	62,000
Black	53,000	65,000	49,000	45,000	58,000
Hispanic	52,000	65,000	48,000	50,000	60,000
Asian	56,000	69,000	45,000	48,000	60,100
Other	49,000	70,000	48,500	S	48,000
Computer/math scientists, total	65,000	76,000	56,000	50,000	65,000
White	65,000	79,000	57,000	54,000	65,000
Black	63,000	80,000	57,700	S	S
Hispanic	55,000	72,000	55,000	S	S
Asian	65,000	71,000	52,000	S	72,000
Other	S	S	S	S	S
Life/related scientists, total	57,500	70,000	52,000	46,000	61,000
White	59,000	70,000	55,000	48,000	62,000
Black	54,000	69,000	45,000	S	61,000
Hispanic	55,000	66,000	49,000	S	54,600
Asian	48,000	70,000	37,000	34,000	57,000
Other	52,000	S	47,000	S	S
Physical/related scientists, total	65,000	73,600	54,000	40,000	72,000
White	66,000	75,000	55,000	40,000	72,100
Black	60,000	67,000	47,000	S	75,000
Hispanic	58,400	63,000	50,000	S	75,000
Asian	60,000	65,000	45,000	S	70,000
Other	50,000	S	S	S	S
Social/related scientists, total	54,000	65,000	50,000	51,000	56,000
White	55,000	65,000	51,000	50,000	56,200
Black	50,000	53,000	49,500	S	58,000
Hispanic	48,600	59,000	46,000	S	60,000
Asian	49,000	50,000	49,000	S	46,000
Other	48,000	S	48,000	S	S

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-16.
Median annual salaries of U.S. scientists and engineers, by highest degree attained, occupation, race or ethnicity, and employment sector: 1997
(Dollars)

Occupation and race/ethnicity	Employed S&Es, total	Sector of employment			
		Business/ industry	4-yr. college/ university	Other educational institution	Government
Engineers, total	72,000	75,000	65,000	S	70,000
White	73,900	79,000	67,000	S	71,000
Black	67,000	73,500	60,000	S	S
Hispanic	66,100	72,000	60,000	S	S
Asian	70,000	72,000	65,000	S	60,000
Other	72,100	S	S	S	S
Non-S&E occupations, total	65,000	75,000	60,000	58,000	71,000
White	66,000	75,000	60,000	58,000	72,000
Black	53,100	55,000	53,100	58,700	52,000
Hispanic	52,000	65,000	52,000	52,000	52,000
Asian	72,000	82,000	60,000	60,000	66,000
Other	55,000	61,300	53,400	S	S
Managers/administrators	83,500	90,000	80,000	73,700	77,400
White	85,000	92,000	80,700	72,100	77,500
Black	71,200	77,900	70,000	S	53,000
Hispanic	65,000	65,000	72,500	S	25,000
Asian	88,100	90,300	76,000	S	61,000
Other	72,100	S	S	S	S
Other non-S&E occupations	52,300	56,200	53,000	45,000	60,900
White	53,000	55,000	53,200	45,000	63,700
Black	42,000	25,000	50,000	36,600	S
Hispanic	52,000	63,000	52,000	S	S
Asian	63,100	72,100	56,000	48,000	66,000
Other	34,000	S	39,000	S	S

S = suppressed for reasons of confidentiality and/or data reliability

[a]Includes professional degrees.

NOTES: The term "Scientists and Engineers" (S&Es) includes all people who have ever received a bachelor's degree or higher in an S&E field, plus people holding a non-S&E bachelor's or higher degree who were employed in an S&E occupation during the 1993, 1995, or 1997 SESTAT surveys. Figures are rounded to nearest hundred. Details may not add to total because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See figure 3-11 in Volume 1.

Appendix table 3-17.
Median annual salaries of U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and years since degree: 1997
(Dollars)

Occupation and race/ethnicity	Employed S&Es, total	Years since degree: <5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
All degree levels[a]									
All occupations, total	50,000	33,100	45,000	53,000	58,000	58,000	58,000	62,000	60,000
White	50,000	33,000	45,000	54,000	60,000	60,000	60,000	65,000	60,000
Black	40,000	30,000	38,000	40,600	45,000	47,000	49,000	44,000	46,500
Hispanic	44,000	31,000	42,000	50,000	51,000	52,000	50,000	56,500	45,000
Asian	50,000	40,000	50,000	58,000	55,000	56,000	50,000	50,000	49,000
Other	40,000	27,000	43,000	45,000	50,000	46,000	50,000	S	S
S&E occupations, total	55,000	40,000	50,000	58,000	62,000	63,000	66,000	67,000	63,000
White	55,000	40,000	50,000	58,000	62,000	63,000	67,000	68,000	64,000
Black	48,000	38,000	45,000	50,000	54,000	54,000	56,700	45,000	S
Hispanic	50,000	39,000	50,000	58,000	55,000	65,000	60,000	78,000	S
Asian	55,000	46,000	52,000	60,000	62,500	67,000	64,000	60,000	63,800
Other	49,000	30,000	56,000	50,000	54,000	55,000	S	S	S
Scientists, total	52,000	37,400	48,000	55,000	59,000	59,500	62,000	62,000	62,000
White	52,300	36,000	48,000	55,000	60,000	60,000	62,000	63,000	62,000
Black	46,000	35,000	42,000	48,000	52,000	50,000	52,400	S	S
Hispanic	48,000	35,000	48,000	55,000	53,000	55,000	52,500	72,000	S
Asian	53,000	45,000	50,000	61,000	61,000	64,000	60,000	50,000	60,500
Other	40,000	26,500	55,000	40,000	54,000	48,000	S	S	S
Computer/math scientists, total	56,000	46,000	53,000	60,000	60,100	61,000	64,000	63,300	58,000
White	56,800	45,000	53,000	60,000	60,500	62,200	64,000	63,500	60,900
Black	48,000	39,000	45,000	50,000	53,000	53,000	58,000	S	S
Hispanic	53,000	42,500	54,000	55,000	55,000	61,000	S	S	S
Asian	56,000	50,000	55,000	63,000	65,000	62,000	60,000	53,000	S
Other	54,000	S	S	S	S	S	S	S	S
Life/related scientists, total	44,000	27,000	38,000	49,000	51,000	53,000	56,700	56,000	67,300
White	45,000	27,000	36,400	49,000	52,000	53,000	56,000	55,000	67,300
Black	45,900	27,000	45,000	48,000	47,900	47,000	S	S	S
Hispanic	40,000	22,000	35,700	42,500	48,000	49,200	47,000	S	S
Asian	40,000	28,000	42,000	48,000	52,000	65,000	68,000	56,200	S
Other	27,900	25,000	S	S	S	S	S	S	S
Physical/related scientists, total	50,000	32,000	43,000	53,000	59,100	60,000	60,000	70,000	68,000
White	50,000	32,000	44,000	53,000	60,000	60,000	60,000	71,000	71,000
Black	42,000	33,000	41,000	38,000	55,000	52,000	S	S	S
Hispanic	41,300	32,000	37,600	56,000	40,000	51,000	S	S	S
Other	58,000	30,000	S	S	S	S	S	S	S
Social/related scientists, total	45,000	30,000	40,000	50,000	52,000	52,000	60,000	60,000	55,000
White	45,000	30,000	39,500	51,000	53,000	52,000	60,000	60,000	51,500
Black	36,900	25,000	37,000	35,000	55,000	38,000	S	S	S
Hispanic	40,000	30,000	44,000	60,000	45,000	45,000	S	S	S
Asian	44,000	35,000	42,000	55,000	51,000	73,000	S	S	S
Other	30,000	25,000	S	S	S	S	S	S	S
Engineers, total	60,000	44,000	53,300	60,000	65,000	68,000	70,000	71,000	64,000
White	60,000	43,600	53,000	60,000	65,000	68,000	72,000	72,000	64,000
Black	52,000	42,500	52,000	55,000	57,000	67,000	S	S	S
Hispanic	54,000	41,000	53,000	60,000	59,700	68,000	66,000	S	S
Asian	58,000	47,000	55,000	60,000	63,000	70,000	65,000	66,000	65,000
Other	53,000	38,500	S	S	S	S	S	S	S

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-17.
Median annual salaries of U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and years since degree: 1997
(Dollars)

Occupation and race/ethnicity	Employed S&Es, total	Years since degree: <5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
Non-S&E occupations, total	46,000	30,000	40,000	50,000	54,000	55,000	52,000	58,000	57,000
White	48,000	30,000	41,600	50,000	56,000	56,000	54,000	60,000	60,000
Black	38,000	28,000	35,000	38,000	42,000	45,000	47,000	42,600	45,000
Hispanic	40,000	28,000	38,000	46,000	50,000	50,000	50,000	50,000	44,000
Asian	42,000	33,000	45,000	52,000	50,000	48,000	41,000	45,000	40,000
Other	36,000	25,000	36,000	42,000	50,000	45,000	48,000	S	S
Managers/administrators	62,000	42,000	53,000	60,000	65,900	67,000	72,000	80,000	72,000
White	64,000	42,000	54,500	60,000	67,000	70,000	74,000	80,000	74,900
Black	50,000	36,000	45,000	45,000	57,000	55,000	56,000	54,000	S
Hispanic	55,000	39,000	54,000	50,000	63,000	60,000	60,000	S	S
Asian	60,000	40,500	50,000	65,000	64,000	60,000	67,000	54,800	49,000
Other	50,900	S	S	56,000	S	S	S	S	S
Other non-S&E occupations	40,000	28,000	37,700	45,000	46,000	48,000	46,000	50,000	50,000
White	40,000	28,000	38,000	46,900	48,000	50,000	47,000	50,000	50,000
Black	35,000	27,000	32,000	36,000	39,000	39,000	43,000	40,000	42,000
Hispanic	36,000	27,000	35,000	43,000	42,000	45,000	46,400	49,000	42,000
Asian	38,700	32,000	43,000	47,000	40,000	39,600	40,000	40,000	35,400
Other	32,000	24,900	36,000	35,000	41,600	35,000	S	S	S
Bachelor's									
All occupations, total	45,000	28,800	40,000	50,000	52,000	50,000	53,000	57,000	55,000
White	45,500	28,500	40,000	50,000	54,000	51,500	55,000	60,000	56,000
Black	36,000	26,000	33,000	38,000	41,000	40,000	45,000	40,000	46,500
Hispanic	40,000	27,000	38,000	48,000	48,000	48,500	50,000	55,000	44,000
Asian	42,300	35,000	43,000	50,000	45,000	48,000	45,000	48,000	40,000
Other	35,000	25,000	37,000	40,000	50,000	46,000	48,000	S	S
S&E occupations, total	52,000	37,000	48,000	55,000	60,000	60,000	62,400	65,000	60,000
White	53,000	37,000	48,000	55,000	60,000	60,000	64,000	65,000	60,000
Black	47,500	35,000	45,000	50,000	55,000	53,000	54,000	S	S
Hispanic	49,500	36,000	48,000	56,000	55,000	63,000	S	S	S
Asian	50,000	40,000	48,000	55,000	56,400	59,500	59,000	57,600	53,000
Other	45,000	30,000	S	S	S	S	S	S	S
Scientists, total	50,000	34,000	45,000	53,000	55,000	55,000	58,000	56,000	55,000
White	50,000	33,000	45,000	53,200	56,000	56,000	58,300	60,000	55,000
Black	45,000	32,000	41,000	47,600	53,000	50,000	S	S	S
Hispanic	46,000	30,000	48,000	50,000	53,000	S	S	S	S
Asian	48,000	39,500	45,000	56,000	55,000	52,000	53,000	48,000	S
Other	31,600	25,000	S	S	S	S	S	S	S
Computer/math scientists, total	54,000	41,000	50,000	55,000	59,000	59,000	62,000	60,000	57,000
White	55,000	41,000	50,000	55,000	60,000	60,000	62,000	63,300	60,000
Black	47,000	35,000	42,000	50,000	52,000	53,000	S	S	S
Hispanic	50,000	35,000	50,000	55,000	55,000	S	S	S	S
Asian	50,000	45,000	50,000	56,300	58,000	59,500	56,000	S	S
Other	S	S	S	S	S	S	S	S	S
Life/related scientists, total	36,000	22,000	31,000	40,000	42,000	46,000	43,000	48,500	S
White	36,000	22,000	30,000	41,000	42,000	46,000	41,200	48,500	S
Black	46,000	S	S	S	S	S	S	S	S
Hispanic	33,000	20,000	S	S	S	S	S	S	S
Asian	35,000	S	S	S	S	S	S	S	S
Other	S	S	S	S	S	S	S	S	S

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-17.
Median annual salaries of U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and years since degree: 1997
(Dollars)

Occupation and race/ethnicity	Employed S&Es, total	Years since degree: <5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
Physical/related scientists, total	42,000	27,300	37,000	44,000	52,000	52,000	54,000	57,000	52,000
White	42,800	27,000	37,000	47,400	52,000	52,000	55,000	64,000	57,000
Black	41,000	31,000	S	S	S	S	S	S	S
Hispanic	34,000	S	S	S	S	S	S	S	S
Asian	40,000	30,000	S	S	S	S	S	S	S
Other	S	S	S	S	S	S	S	S	S
Social/related scientists, total	25,000	21,000	25,000	S	S	S	S	S	S
White	25,000	20,000	25,000	S	S	S	S	S	S
Black	27,500	S	S	S	S	S	S	S	S
Hispanic	22,500	22,500	S	S	S	S	S	S	S
Asian	S	S	S	S	S	S	S	S	S
Other	S	S	S	S	S	S	S	S	S
Engineers, total	55,000	40,000	50,000	56,000	62,300	65,000	68,000	70,000	62,000
White	56,700	40,000	50,000	57,000	63,000	65,000	70,000	70,000	62,000
Black	50,000	40,000	50,000	53,400	56,000	S	S	S	S
Hispanic	52,000	40,000	48,000	60,000	57,200	66,700	S	S	S
Asian	51,000	40,000	48,000	53,500	59,000	65,000	60,000	60,000	61,000
Other	53,000	S	S	S	S	S	S	S	S
Non-S&E occupations, total	40,000	25,000	35,000	44,000	46,000	47,000	50,000	51,000	50,000
White	40,000	25,000	35,000	45,000	48,000	48,000	50,000	54,000	52,000
Black	33,000	25,000	31,000	35,000	37,000	39,000	41,700	40,000	44,000
Hispanic	35,000	25,000	34,200	42,000	43,000	45,000	50,000	49,000	42,000
Asian	36,500	29,000	36,000	43,800	37,000	40,000	38,000	44,300	35,400
Other	31,000	23,000	S	32,000	S	45,000	S	S	S
Managers/administrators	56,000	33,000	44,000	52,000	60,000	60,000	70,000	75,000	70,000
White	60,000	32,500	45,000	53,000	63,000	60,000	70,000	79,000	72,000
Black	45,000	34,000	35,900	40,800	48,000	50,000	52,000	S	S
Hispanic	49,500	33,000	43,000	49,200	64,000	60,000	S	S	S
Asian	50,000	35,000	42,000	53,000	55,000	60,000	53,000	60,000	S
Other	46,000	S	S	S	S	S	S	S	S
Other non-S&E occupations	35,000	25,000	32,400	38,900	40,000	40,000	40,000	44,000	41,000
White	35,000	25,000	32,500	40,000	40,000	40,000	40,000	45,000	42,000
Black	30,000	24,000	30,000	34,800	33,000	35,000	38,000	36,000	42,000
Hispanic	30,200	25,000	32,000	35,000	40,000	39,000	50,000	49,000	S
Asian	35,000	28,000	35,000	40,000	35,300	38,000	36,500	40,000	33,000
Other	29,000	22,000	S	30,800	S	33,600	S	S	S
Master's									
All occupations, total	53,000	42,000	52,000	56,000	60,000	60,000	58,000	62,000	60,000
White	54,000	41,000	52,500	56,000	60,000	61,500	59,200	63,000	60,000
Black	45,000	36,000	45,000	45,000	45,000	51,000	50,000	S	S
Hispanic	50,000	38,500	54,000	50,000	54,000	56,000	50,000	S	S
Asian	55,000	48,000	55,000	63,000	60,000	62,300	60,000	56,000	70,000
Other	45,000	32,000	51,000	S	S	S	S	S	S
S&E occupations, total	59,000	47,500	57,000	63,000	65,000	65,300	69,000	67,700	69,000
White	60,000	46,000	57,000	63,000	65,000	65,500	69,000	69,700	69,000
Black	48,000	43,000	50,000	47,800	52,000	60,000	S	S	S
Hispanic	55,000	46,500	58,000	60,000	55,000	65,000	S	S	S
Asian	59,000	50,000	57,500	65,600	64,900	69,000	68,500	67,700	S
Other	50,000	S	S	S	S	S	S	S	S

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-17.
Median annual salaries of U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and years since degree: 1997
(Dollars)

Occupation and race/ethnicity	Employed S&Es, total	Years since degree							
		<5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
Scientists, total	54,000	43,000	52,000	60,000	60,000	59,900	61,000	60,000	67,300
White	54,000	40,000	52,000	60,000	60,000	59,900	61,000	62,000	67,300
Black	43,000	35,000	42,300	47,000	48,500	52,000	S	S	S
Hispanic	50,000	45,000	50,000	S	S	S	S	S	S
Asian	57,000	50,000	57,000	66,000	66,000	65,000	63,000	S	S
Other	42,000	S	S	S	S	S	S	S	S
Computer/math scientists, total	60,000	52,000	60,000	67,000	65,000	66,000	70,000	63,500	S
White	61,000	52,000	60,000	68,000	65,000	68,000	70,000	63,500	S
Black	52,000	47,000	54,600	S	S	S	S	S	S
Hispanic	59,500	55,000	S	S	S	S	S	S	S
Asian	60,000	53,000	61,000	67,500	67,000	68,000	S	S	S
Other	S	S	S	S	S	S	S	S	S
Life/related scientists, total	42,000	31,000	36,400	43,800	47,000	52,000	52,000	S	S
White	42,000	32,000	35,000	44,500	48,000	52,000	52,000	S	S
Black	39,000	S	S	S	S	S	S	S	S
Hispanic	33,000	S	S	S	S	S	S	S	S
Asian	39,000	28,000	44,000	S	S	S	S	S	S
Other	S	S	S	S	S	S	S	S	S
Physical/related scientists, total	51,000	35,000	46,000	57,600	61,600	60,000	52,200	70,000	S
White	52,000	36,000	51,000	56,000	64,900	62,000	52,200	70,000	S
Black	41,000	S	S	S	S	S	S	S	S
Hispanic	47,500	S	S	S	S	S	S	S	S
Asian	44,000	35,000	30,000	S	S	S	S	S	S
Other	S	S	S	S	S	S	S	S	S
Social/related scientists, total	41,100	30,000	37,000	46,000	47,500	48,000	54,000	60,000	S
White	42,000	30,000	36,000	47,000	47,500	48,000	54,000	S	S
Black	35,000	25,000	S	S	S	S	S	S	S
Hispanic	45,000	32,000	S	S	S	S	S	S	S
Asian	38,000	S	S	S	S	S	S	S	S
Other	S	S	S	S	S	S	S	S	S
Engineers, total	63,600	50,000	60,000	68,900	70,000	74,000	75,000	78,500	76,500
White	65,000	52,000	60,000	69,000	70,000	74,000	78,000	78,500	84,000
Black	58,000	50,000	60,000	S	S	S	S	S	S
Hispanic	58,500	49,000	60,000	62,000	S	S	S	S	S
Asian	60,000	48,000	58,000	65,600	62,700	70,000	71,500	70,000	S
Other	55,000	S	S	S	S	S	S	S	S
Non-S&E occupations, total	50,000	38,000	50,000	50,000	54,000	58,500	52,200	60,000	55,000
White	50,500	38,500	50,000	50,400	56,400	60,000	54,000	60,000	56,000
Black	44,000	35,000	43,000	43,000	45,000	50,000	50,000	S	S
Hispanic	46,000	36,000	48,000	46,000	53,100	55,000	S	S	S
Asian	50,000	42,000	50,000	60,000	54,000	50,000	47,900	50,000	S
Other	42,000	30,000	S	S	S	S	S	S	S
Managers/administrators	68,000	55,000	65,000	65,000	69,000	77,000	75,000	87,000	80,000
White	70,000	55,000	65,000	66,500	70,000	80,000	75,000	95,000	80,000
Black	54,700	42,000	55,000	47,000	60,000	60,000	S	S	S
Hispanic	60,000	55,000	66,000	52,000	59,800	60,000	S	S	S
Asian	65,000	52,000	70,000	67,500	72,000	60,000	67,000	S	S
Other	53,500	S	S	S	S	S	S	S	S

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-17.
Median annual salaries of U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and years since degree: 1997
(Dollars)

Occupation and race/ethnicity	Employed S&Es, total	Years since degree: <5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
Other non-S&E occupations	42,000	34,000	41,600	43,000	45,000	46,500	48,000	46,000	36,000
White	42,000	34,000	42,000	43,000	45,000	47,500	49,000	47,500	42,000
Black	40,000	34,000	36,500	40,000	40,000	44,400	45,000	S	S
Hispanic	39,000	33,000	38,000	43,000	50,400	52,000	S	S	S
Asian	42,000	40,000	46,000	48,200	42,000	40,000	45,000	S	S
Other	37,000	S	S	S	S	S	S	S	S
Doctorate									
All occupations, total	63,000	42,500	56,000	62,000	70,000	74,100	76,000	80,000	79,000
White	63,400	41,000	56,000	62,000	70,000	74,000	76,000	80,000	79,000
Black	54,000	42,000	56,000	50,000	58,700	69,000	75,000	S	S
Hispanic	55,000	42,000	52,000	60,000	60,000	70,000	70,000	59,000	S
Asian	65,000	48,000	60,000	70,000	74,000	80,800	78,000	79,500	80,000
Other	52,000	38,000	40,000	48,000	70,000	60,000	S	S	S
S&E occupations, total	62,000	43,600	56,000	62,000	70,000	71,700	73,300	78,000	79,000
White	62,000	41,100	55,000	61,000	68,800	70,000	73,700	78,000	79,000
Black	55,000	42,000	52,000	55,600	58,000	65,500	71,000	S	S
Hispanic	55,900	42,000	54,600	58,000	60,000	68,000	66,100	S	S
Asian	62,000	50,000	58,000	70,000	75,000	78,000	75,000	81,000	84,000
Other	50,000	40,000	50,000	45,000	S	58,000	S	S	S
Scientists, total	60,000	40,000	52,000	60,000	66,000	69,000	70,000	75,000	78,000
White	60,000	38,900	52,000	60,000	66,000	68,000	70,000	75,000	78,000
Black	53,000	42,000	49,700	55,000	58,000	64,000	71,000	S	S
Hispanic	52,000	42,000	50,000	56,000	56,000	68,000	57,000	S	S
Asian	56,000	42,000	50,000	65,300	70,000	74,000	70,000	72,000	84,000
Other	49,000	40,000	38,000	45,000	S	S	S	S	S
Computer/math scientists, total	65,000	55,000	65,000	65,000	70,000	69,000	69,000	70,000	76,400
White	65,000	50,000	65,000	60,800	70,000	68,000	69,000	72,000	75,000
Black	63,000	79,800	S	S	S	S	S	S	S
Hispanic	55,000	50,000	68,000	55,000	S	64,000	S	S	S
Asian	65,000	59,800	65,000	70,000	80,000	71,000	62,100	S	S
Other	S	S	S	S	S	S	S	S	S
Life/related scientists, total	57,500	30,000	50,000	60,000	66,900	68,100	72,000	75,000	78,000
White	59,000	31,500	50,000	60,000	66,000	67,800	72,100	75,000	75,000
Black	54,000	32,000	49,000	60,000	72,100	65,500	S	S	S
Hispanic	55,000	35,000	52,000	56,000	76,000	S	S	S	S
Asian	48,000	28,800	43,000	60,000	70,000	72,000	70,000	71,400	S
Other	52,000	30,000	S	S	S	S	S	S	S
Physical/related scientists, total	65,000	44,500	55,000	65,000	74,900	75,000	75,000	80,000	80,000
White	66,000	43,000	55,000	65,000	75,000	75,000	75,000	80,000	80,000
Black	60,000	48,000	47,000	52,000	75,000	75,000	S	S	S
Hispanic	58,400	42,000	55,000	60,000	S	75,000	S	S	S
Asian	60,000	48,000	53,000	65,000	72,000	74,000	71,000	S	S
Other	50,000	S	S	S	S	S	S	S	S

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-17.
Median annual salaries of U.S. scientists and engineers, by highest degree attained, broad occupation, race or ethnicity, and years since degree: 1997
(Dollars)

Occupation and race/ethnicity	Employed S&Es, total	Years since degree: <5 years	5–9 years	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35+ years
Social/related scientists, total	54,000	40,000	48,500	57,000	60,000	63,000	65,000	70,000	72,100
White	55,000	39,000	49,000	57,000	60,000	63,000	65,000	70,000	72,300
Black	50,000	42,000	50,000	50,000	58,000	56,500	S	S	S
Hispanic	48,600	39,000	46,200	55,000	56,000	S	S	S	S
Asian	49,000	44,000	48,000	55,000	50,000	90,000	S	S	S
Other	48,000	40,000	S	S	S	S	S	S	S
Engineers, total	72,000	60,000	68,500	74,000	80,000	85,000	85,000	85,000	83,000
White	73,900	60,000	68,500	74,000	80,100	85,100	85,000	85,000	83,000
Black	67,000	50,000	67,000	S	S	S	S	S	S
Hispanic	66,100	50,300	72,100	60,000	S	68,000	S	S	S
Asian	70,000	60,000	68,000	74,900	80,100	85,000	80,100	S	S
Other	72,100	S	S	S	S	S	S	S	S
Non-S&E occupations, total	65,000	41,000	59,000	65,000	70,000	77,700	87,000	94,000	78,000
White	66,000	41,000	58,000	64,300	72,000	78,000	87,000	98,000	80,000
Black	53,100	45,000	62,000	42,700	58,700	74,000	S	S	S
Hispanic	52,000	44,000	46,800	75,000	77,500	72,000	S	S	S
Asian	72,000	40,500	67,000	84,200	72,000	98,000	94,000	72,000	S
Other	55,000	32,000	S	S	S	S	S	S	S
Managers/administrators	83,500	60,000	72,000	80,100	85,000	90,000	97,200	105,000	90,000
White	85,000	61,000	72,000	82,800	89,000	90,000	97,500	110,000	92,000
Black	71,200	61,900	71,300	50,000	77,900	95,000	S	S	S
Hispanic	65,000	50,000	70,000	50,000	60,000	96,000	S	S	S
Asian	88,100	50,000	75,000	90,000	80,000	100,000	95,000	S	S
Other	72,100	S	S	S	S	S	S	S	S
Other non-S&E occupations	52,300	37,000	50,000	53,000	58,000	65,000	75,000	73,000	62,500
White	53,000	38,000	50,000	53,000	58,000	65,000	74,600	80,000	63,000
Black	42,000	36,600	50,400	40,000	50,000	40,000	S	S	S
Hispanic	52,000	38,000	42,500	80,000	S	S	S	S	S
Asian	63,100	38,000	60,000	71,000	65,000	80,000	78,000	S	S
Other	34,000	S	S	S	S	S	S	S	S

S = suppressed for reasons of confidentiality and/or data reliability

[a]Includes professional degrees.

NOTES: The term "Scientists and Engineers" (S&Es) includes all people who have ever received a bachelor's degree or higher in an S&E field, plus people holding a non-S&E bachelor's or higher degree who were employed in an S&E occupation during the 1993, 1995, or 1997 SESTAT surveys. Figures are rounded to nearest hundred. Details may not add to total because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See page 3-13 in Volume 1.

Appendix table 3-18.
Number, employment status, and median salary of 1995 and 1996 bachelor's and master's degree recipients, by field of degree: 1997

Degree field	Graduates 1995 and 1996[a] (thousands)	Education and employment status (percentage distribution)				Median salary FT employed graduates[b] (Dollars)
			Not full-time status			
		Full-time students	Employed in science or engineering	Employed in other occupations	Not employed and not FT student	
Bachelor's degree recipients						
Science and engineering	708.9	21	21	53	5	28,200
All sciences	593.8	23	12	60	5	26,000
Computer and information sciences	41.0	6	57	34	3	37,700
Mathematical sciences	26.8	19	15	63	3	29,800
Life and related sciences	139.0	31	11	53	5	22,800
Physical and related sciences	36.6	38	26	33	3	27,300
Psychology	138.0	24	6	65	5	22,300
Social and related sciences	212.4	18	6	70	6	26,400
All engineering	115.1	13	65	18	3	37,700
Aerospace and related engineering	3.0	22	48	27	2	34,000
Chemical engineering	11.6	17	65	14	4	39,300
Civil and architectural engineering	20.7	14	63	20	3	34,400
Electrical, electronics, computer, and communications engineering	32.9	10	70	16	4	40,500
Industrial engineering	5.8	8	66	24	2	37,600
Mechanical engineering	27.9	11	71	15	3	38,200
Other engineering	13.2	21	52	25	3	34,100
Master's degree recipients						
Science and engineering	149.5	21	49	27	3	41,500
All sciences	102.5	23	36	36	4	37,200
Computer & information sciences	18.2	6	74	18	2	51,200
Mathematical sciences	7.9	27	37	32	3	39,700
Life and related sciences	15.3	32	37	27	4	32,400
Physical and related sciences	9.7	37	42	18	3	33,600
Psychology	26.4	22	29	43	5	29,700
Social and related sciences	25.1	26	15	54	5	35,000
All engineering	47.0	15	75	9	2	49,900
Aerospace and related engineering	1.5	31	54	15	0[c]	48,800
Chemical engineering	2.0	33	61	4	2	47,600
Civil and architectural engineering	6.5	11	76	11	1	41,900
Electrical, electronics, computer, and communications engineering	1.6	15	77	7	1	55,000
Industrial engineering	3.2	13	70	16	1	49,900
Mechanical engineering	7.2	16	72	10	2	47,700
Other engineering	10.4	10	78	9	4	49,000

[a]Includes people who received a bachelor's or master's degree in science or engineering from a U.S. college or university from July 1994 through June 1996.

[b]Salary for self-employed and full-time students is not included in data represented in this table. Median salaries are rounded to the nearest hundred dollars.

[c]While the observed value in the survey data set is 0 (zero) percent, it is possible that some persons in the true population have this characteristic.

NOTES: For graduates with more than one eligible degree at the same level (bachelor's/master's), this analysis uses the degree for which the graduate was sampled. Details may not sum to totals because of rounding. Percentages were calculated on unrounded data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Survey of Recent College Graduates, 1997.*

See page 3-14 in Volume 1.

Appendix table 3-19.
Number of U.S. scientists and engineers in the labor force, by sex, race/ethnicity, and age: 1997

Characteristics	All ages	Age									
		Under 25	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65+
All degree levels											
Total	10,779,300	478,500	1,243,600	1,293,600	1,559,300	1,728,400	1,770,000	1,359,600	781,100	432,100	340,900
Male	7,151,100	226,500	671,400	825,700	1,006,400	1,110,000	1,223,500	969,800	599,500	344,400	279,400
Female	3,628,200	252,000	572,200	467,900	553,000	618,400	546,500	389,800	181,600	87,700	61,500
Hispanic	381,600	29,000	65,800	58,600	68,200	56,000	49,700	31,500	21,000	9,300	7,700
White	9,025,600	376,400	991,300	1,044,200	1,277,500	1,455,300	1,509,300	1,178,400	669,300	377,500	307,200
Black	570,000	29,400	73,900	68,100	86,500	93,700	99,400	60,800	38,400	19,600	14,200
Asian	765,400	40,100	107,500	119,100	121,600	117,000	106,800	84,400	49,500	24,500	11,000
American Indian	32,800	3,600	5,100	3,400	4,700	4,900	4,200	3,900	2,900	1,100	800
Other	3,900	NA	NA	200	900	1,500	500	600	NA	200	NA
Bachelor's											
Total	6,318,900	456,200	1,000,200	850,200	918,800	983,800	934,100	644,900	349,100	203,800	169,800
Male	4,129,000	215,300	545,100	547,000	602,200	631,400	653,200	458,900	270,800	159,300	143,400
Female	2,189,900	240,900	455,100	303,200	316,600	352,300	280,900	186,000	78,300	44,500	26,300
Hispanic	244,600	27,900	54,700	41,000	42,200	32,900	26,300	14,900	11,100	4,500	3,400
White	5,306,500	359,700	804,400	705,900	761,900	834,300	796,200	559,700	294,200	182,100	156,700
Black	355,800	28,100	61,600	48,700	58,600	56,100	58,200	26,800	18,700	6,800	5,200
Asian	387,700	36,800	74,800	52,400	52,700	56,300	50,300	40,600	23,700	9,900	4,200
American Indian	22,200	3,600	4,700	2,000	3,200	3,100	2,700	2,400	1,400	400	300
Other	2,100	NA	NA	200	200	1,000	300	500	NA	NA	NA
Master's											
Total	2,872,100	21,400	183,000	292,900	402,800	466,200	533,700	481,300	272,600	137,400	96,000
Male	1,830,400	10,700	93,300	179,000	247,100	279,200	337,400	325,900	191,500	104,100	69,400
Female	1,041,700	10,600	89,700	113,900	155,700	186,900	196,300	155,400	81,000	33,300	26,600
Hispanic	90,900	1,100	7,900	11,600	17,100	14,700	16,200	11,400	6,300	3,300	2,000
White	2,371,900	15,900	138,900	221,300	323,800	384,400	449,300	413,800	233,200	117,500	84,900
Black	154,200	1,300	9,200	13,700	20,100	28,100	29,900	24,300	15,300	7,300	6,100
Asian	246,900	3,100	26,700	45,400	40,600	37,200	37,100	30,800	16,800	8,700	2,700
American Indian	7,300	NA	400	900	900	1,400	1,200	900	900	400	300
Other	900	NA	NA	NA	300	400	NA	100	NA	200	NA
Doctorate											
Total	705,800	NA	10,000	58,900	94,800	104,600	117,600	124,900	104,500	50,200	40,300
Male	535,100	NA	6,500	39,700	66,700	74,400	85,600	95,000	88,800	43,900	34,400
Female	170,700	NA	3,500	19,100	28,200	30,200	32,000	29,800	15,800	6,300	5,900
Hispanic	19,400	NA	NA	1,800	3,500	2,700	3,600	3,200	2,500	1,200	1000
White	569,600	NA	8,000	41,300	68,300	81,600	96,600	106,100	91,200	41,600	35,000
Black	21,900	NA	100	900	2,400	3,400	4,400	4,700	2,400	2,500	1,000
Asian	92,700	NA	1,900	14,600	20,500	16,600	12,700	10,500	8,000	4,800	3,200
American Indian	2,000	NA	NA	200	100	300	300	400	500	100	100
Other	200	NA	NA	NA	100	100	NA	NA	NA	NA	NA

NA = data not available

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See figure 3-12 in Volume 1.

Appendix table 3-20.
S&E degree holders working through a temporary help or employment agency (percent): 1997

Years since degree	Other jobs	S&E jobs
1–5	1.2	0.5
6–10	0.6	0.4
11–15	0.3	0.3
16–20	0.2	0.3
21–25	0.5	0.2
31–35	0.9	0.2
36+	1.0	0.7

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See figure 3-3 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 3-21.
S&E trained U.S. scientists and engineers in the labor force, by degree level, tenure status at four-year educational institutions, and age: 1997

Field of highest degree	S&E trained, total	Age									
		Under 25	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65+
All degree levels											
All science & engineering	7,854,500	268,100	1,115,500	1,005,100	1,106,500	1,201,700	1,182,800	903,900	541,600	293,600	235,800
Engineering	1,944,100	37,900	226,000	282,200	342,800	283,100	233,100	204,400	144,800	105,000	84,700
Aerospace engineering	78,100	1,200	9,800	11,600	14,400	9,900	9,300	9,300	7,200	3,400	2,000
Chemical engineering	140,300	4,800	17,300	18,900	25,500	17,600	19,300	16,400	10,300	6,200	4,000
Civil engineering	328,000	5,400	35,500	38,200	51,600	51,500	47,000	36,200	24,100	21,400	17,000
Electrical engineering	593,700	9,500	70,900	100,000	106,500	93,900	65,100	59,600	43,500	25,300	19,400
Industrial engineering	107,900	1,900	14,000	17,400	19,400	13,400	13,300	9,500	7,900	5,200	6,000
Mechanical engineering	392,100	10,100	50,800	60,300	70,600	47,000	40,600	39,500	26,700	25,600	20,900
Other engineering	304,000	5,100	27,700	35,800	54,800	49,800	38,400	33,900	25,100	17,800	15,500
Life sciences	1,228,000	50,400	166,300	132,000	162,100	235,700	199,800	135,000	80,000	34,700	32,100
Agriculture	222,500	4,800	22,400	20,500	41,800	47,500	32,400	19,400	14,800	8,400	10,400
Biological sciences	907,100	42,400	129,700	102,800	106,200	166,400	149,900	106,400	59,800	23,400	20,100
Health/medical	98,400	3,100	14,100	8,700	14,100	21,900	17,500	9,100	5,400	2,900	1,600
Computer math sciences	1,020,000	21,900	124,600	178,700	185,700	154,100	141,000	118,000	59,400	25,600	11,000
Computer sciences	553,300	10,600	73,800	124,400	136,200	94,200	59,100	34,900	15,800	3,400	800
Mathematical sciences	466,700	11,200	50,800	54,300	49,600	59,900	81,900	83,100	43,600	22,200	10,200
Physical sciences	631,600	15,800	63,300	66,700	90,000	96,800	95,600	73,100	66,100	33,300	30,800
Chemistry	281,800	8,300	29,000	29,200	34,100	40,300	41,300	37,400	34,900	12,400	14,900
Geosciences	149,600	3,600	13,000	15,400	29,500	30,200	23,200	12,300	8,100	8,200	6,200
Physics/astronomy	146,700	3,100	15,500	17,900	18,300	17,000	20,500	19,100	18,700	9,700	7,000
Other physical sciences	53,400	800	5,800	4,300	8,000	9,400	10,600	4,300	4,400	3,000	2,700
Social sciences	3,030,900	142,200	535,300	345,400	325,900	432,000	513,300	373,500	191,200	94,900	77,100
Economics	409,100	15,900	68,300	62,400	49,400	54,200	60,100	36,100	30,300	19,800	12,800
Political sciences	572,400	32,800	121,900	86,300	72,900	72,100	70,600	58,000	29,400	13,300	15,100
Psychology	1,136,800	57,600	198,300	116,900	117,000	176,700	199,100	142,900	68,900	31,900	27,400
Sociology/anthropology	571,100	22,300	97,500	45,400	51,600	81,500	119,600	86,000	38,100	18,200	11,000
Other social sciences	341,500	13,700	49,300	34,400	35,100	47,400	64,000	50,600	24,500	11,700	10,800
Bachelor's											
All science & engineering	5,800,700	263,900	990,000	782,900	821,600	873,500	830,100	577,200	318,100	185,500	157,900
Engineering	1,407,700	36,700	183,300	204,300	248,300	200,400	161,500	136,900	94,400	73,100	68,800
Aerospace engineering	55,700	1,100	7,800	8,900	10,600	7,600	6,500	5,800	4,800	1,300	1,300
Chemical engineering	103,700	4,700	15,200	14,700	19,200	12,700	13,800	10,600	6,500	3,600	2,500
Civil engineering	248,500	5,100	29,700	29,900	39,300	38,400	35,200	24,700	15,800	15,400	14,900
Electrical engineering	422,500	9,000	56,300	69,300	72,500	66,800	45,800	40,200	29,500	17,800	15,300
Industrial engineering	81,700	1,900	11,500	13,300	14,600	9,500	9,400	6,700	5,900	4,400	4,600
Mechanical engineering	313,000	9,900	43,000	47,700	56,500	36,300	30,000	31,200	21,200	19,400	17,900
Other engineering	182,600	5,000	19,700	20,500	35,600	29,100	20,800	17,700	10,800	11,100	12,300
Life sciences	901,700	49,900	154,100	100,700	117,100	178,000	138,200	82,500	41,900	19,800	19,400
Agriculture	178,200	4,800	20,200	16,000	36,900	38,100	23,300	14,100	10,100	6,500	8,200
Biological sciences	647,700	42,000	120,600	78,100	70,100	123,300	101,900	61,800	29,000	11,200	9,700
Health/medical	75,800	3,100	13,300	6,600	10,100	16,600	12,900	6,600	2,800	2,200	1,500
Computer math sciences	733,000	20,900	105,500	142,900	138,700	106,900	91,500	72,200	33,000	14,800	6,600
Computer sciences	391,400	10,000	61,300	100,500	101,800	62,500	29,800	17,300	7,100	1,000	200
Mathematical sciences	341,600	10,900	44,200	42,400	37,000	44,400	61,700	54,900	25,900	13,800	6,500
Physical sciences	389,900	15,500	53,300	41,200	55,900	60,800	57,500	38,100	31,900	18,500	17,100
Chemistry	180,400	8,200	25,200	18,800	20,100	24,900	25,600	22,800	18,600	7,100	8,800
Geosciences	98,300	3,500	10,600	10,600	21,500	20,900	13,200	6,200	2,900	5,100	3,800
Physics/astronomy	70,200	3,000	12,000	8,600	8,500	8,000	10,200	6,200	7,900	3,900	2,000
Other physical sciences	41,000	800	5,500	3,200	5,900	6,900	8,500	2,900	2,500	2,400	2,500
Social sciences	2,368,500	141,000	493,800	293,700	261,600	327,500	381,500	247,400	116,900	59,300	46,000
Economics	342,500	15,700	64,900	55,700	40,000	44,800	46,900	26,800	23,700	14,200	9,900
Political sciences	489,000	32,600	113,900	77,800	63,700	58,600	57,500	43,300	22,700	9,200	9,600
Psychology	768,800	57,300	175,600	92,200	83,400	115,000	123,300	68,200	27,700	13,800	12,400
Sociology/anthropology	507,000	21,900	94,700	40,900	45,500	71,900	106,400	74,000	28,900	14,900	7,900
Other social sciences	261,200	13,500	44,700	27,100	29,100	37,300	47,400	35,000	13,900	7,200	6,100

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-21.
S&E trained U.S. scientists and engineers in the labor force, by degree level, tenure status at four-year educational institutions, and age: 1997

Field of highest degree	S&E trained, total	Age									
		Under 25	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65+
Master's											
All science & engineering	1,457,000	4,200	116,200	167,600	200,700	233,700	251,700	225,900	141,900	68,400	46,700
Engineering	436,600	1,200	40,300	66,100	76,800	67,800	59,600	53,400	36,200	23,800	11,400
Aerospace engineering	18,300	100	1,900	2,100	3,100	2,100	2,200	2,800	1,800	1,600	600
Chemical engineering	23,200	100	1,800	2,600	3,800	2,900	4,200	3,800	1,700	1,500	900
Civil engineering	70,100	200	5,700	7,500	10,800	11,700	10,800	10,000	6,600	5,300	1,500
Electrical engineering	144,600	500	13,700	26,900	29,000	22,800	16,700	15,600	10,700	5,700	3,100
Industrial engineering	22,900	NA	2,500	3,600	4,000	3,400	3,600	2,500	1,400	600	1,200
Mechanical engineering	67,000	200	7,500	11,100	11,800	8,600	8,900	6,800	4,300	5,500	2,300
Other engineering	90,600	100	7,200	12,400	14,300	16,300	13,200	11,900	9,700	3,700	1,900
Life sciences	159,800	400	9,800	16,600	21,700	27,100	30,600	25,900	18,000	5,400	4,300
Agriculture	27,300	NA	2,200	3,500	2,600	5,700	5,900	3,100	2,000	900	1,300
Biological sciences	114,800	400	6,900	11,100	15,800	17,100	21,200	21,300	14,100	4,000	3,000
Health/medical	17,700	NA	700	1,900	3,300	4,400	3,500	1,500	1,900	400	NA
Computer math sciences	249,600	1000	18,200	31,800	41,500	41,600	43,400	39,100	21,300	8,700	3,000
Computer sciences	151,900	600	12,200	22,300	31,800	29,600	27,200	16,600	8,600	2,400	600
Mathematical sciences	97,600	400	6,000	9,500	9,600	12,000	16,200	22,500	12,700	6,300	2,400
Physical sciences	117,000	300	8,200	12,400	15,500	18,600	20,400	15,200	14,700	5,300	6,300
Chemistry	37,600	100	2,600	3,500	4,200	6,100	6,500	5,800	6,000	800	2,000
Geosciences	34,800	100	2,300	3,800	5,600	6,900	7,300	2,600	3,000	1,600	1,700
Physics/astronomy	34,000	100	3,000	4,100	4,100	3,300	4,900	5,700	3,900	2,300	2,500
Other physical sciences	10,600	NA	300	1000	1,700	2,200	1,800	1,100	1,800	500	200
Social sciences	494,100	1,300	39,800	40,700	45,200	78,600	97,600	92,400	51,800	25,100	21,600
Economics	44,900	200	3,100	5,000	6,600	6,400	9,100	5,300	3,500	4,400	1,400
Political sciences	66,600	200	8,000	7,500	7,700	11,400	10,500	11,100	3,500	2,700	4,100
Psychology	276,100	300	21,500	18,400	22,700	45,800	57,000	55,800	31,800	12,600	10,200
Sociology/ anthropology	41,000	400	2,700	3,500	3,900	6,700	7,900	7,200	5,200	1,700	1,800
Other social sciences	65,400	200	4,500	6,400	4,400	8,300	13,200	12,900	7,900	3,600	4,100
Doctorate											
All science & engineering	588,400	NA	9,100	53,600	82,700	93,000	99,700	98,800	81,300	39,200	31,000
Engineering	99,600	NA	2,500	11,800	17,700	14,800	12,000	14,000	14,300	8,100	4,500
Aerospace engineering	4,000	NA	200	600	700	200	600	700	600	500	100
Chemical engineering	13,500	NA	300	1,600	2,500	1,900	1,400	1,900	2,200	1,100	500
Civil engineering	9,500	NA	100	800	1,600	1,400	1,000	1,600	1,600	700	600
Electrical engineering	26,600	NA	900	3,800	5,000	4,300	2,700	3,700	3,400	1,900	1,000
Industrial engineering	3,300	NA	0	500	800	500	300	300	600	100	200
Mechanical engineering	12,000	NA	200	1,500	2,300	2,100	1,700	1,500	1,300	700	700
Other engineering	30,700	NA	700	3,000	4,800	4,300	4,500	4,400	4,600	3,100	1,300
Life sciences	165,400	NA	2,100	14,100	23,100	30,600	30,900	26,500	20,100	9,500	8,400
Agriculture	17,100	NA	NA	1000	2,300	3,800	3,200	2,100	2,700	1000	900
Biological sciences	143,700	NA	2,100	13,000	20,300	25,900	26,700	23,400	16,700	8,300	7,400
Health/medical	4,600	NA	NA	100	500	1000	1000	1,000	700	300	100
Computer math sciences	37,200	NA	1000	4,000	5,500	5,600	6,000	6,600	5,100	2,100	1,400
Computer sciences	9,700	NA	300	1,600	2,600	2,100	2,000	900	200	NA	NA
Mathematical sciences	27,500	NA	700	2,300	2,900	3,500	4,000	5,700	5,000	2,100	1,300
Physical sciences	124,100	NA	1,800	12,800	18,600	17,500	17,700	19,500	19,400	9,500	7,400
Chemistry	63,800	NA	1,200	6,800	9,800	9,300	9,200	8,800	10,200	4,400	4,100
Geosciences	16,400	NA	100	900	2,500	2,400	2,700	3,500	2,200	1,500	700
Physics/astronomy	42,100	NA	500	5,000	5,800	5,600	5,500	6,900	6,900	3,500	2,600
Other physical sciences	1,800	NA	NA	100	500	300	300	300	100	100	NA
Social sciences	162,000	NA	1,700	10,900	17,900	24,500	33,100	32,200	22,300	10,100	9,300
Economics	21,700	NA	400	1,700	2,800	3,000	4,100	3,900	3,100	1,200	1,500
Political sciences	16,800	NA	100	1000	1,500	2,200	2,600	3,600	3,200	1,300	1,300
Psychology	85,600	NA	1,200	6,300	9,700	14,600	17,700	17,300	9,200	5,100	4,600
Sociology/anthropology	23,200	NA	100	900	2,200	2,900	5,400	4,800	4,100	1,600	1,300
Other social sciences	14,800	NA	NA	1,000	1,700	1,900	3,400	2,600	2,700	900	600

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 3-21.
S&E trained U.S. scientists and engineers in the labor force, by degree level, tenure status at four-year educational institutions, and age: 1997

Field of highest degree	S&E trained, total	Age								
		Under 25	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65+
	Tenured or tenure-track Ph.D. holders at four-year educational institutions										
All science & engineering	158,500	NA	600	8,900	18,700	25,600	26,100	28,700	26,000	14,600	9,300
Engineering	20,300	NA	100	1,600	3,200	3,200	2,500	3,100	3,100	2,500	1000
Aerospace engineering	800	NA	NA	100	100	NA	200	100	300	NA	NA
Chemical engineering	1,800	NA	NA	100	300	300	100	300	200	400	NA
Civil engineering	2,900	NA	NA	200	500	500	200	500	600	100	300
Electrical engineering	5,500	NA	NA	400	700	1,000	600	900	700	900	300
Industrial engineering	1,200	NA	NA	100	200	300	100	100	200	NA	NA
Mechanical engineering	2,300	NA	NA	200	400	300	400	300	300	200	100
Other engineering	5,800	NA	100	400	900	700	1000	900	800	800	200
Life sciences	46,600	NA	100	1,700	4,800	9,000	9,300	8,600	7,200	3,500	2,500
Agriculture	5,400	NA	NA	300	600	1,300	1000	700	900	400	200
Biological sciences	40,100	NA	100	1,400	4,100	7,500	8,100	7,600	6,000	3,000	2,300
Health/medical	1,100	NA	NA	NA	100	200	200	200	300	100	NA
Math/computer sciences	15,700	NA	100	1,300	2,100	2,600	2,100	2,700	2,800	1,200	800
Computer sciences	2,700	NA	NA	400	700	700	500	300	NA	NA	NA
Mathematical sciences	13,000	NA	100	900	1,400	1,900	1,600	2,400	2,700	1,200	800
Physical sciences	23,200	NA	100	1,500	3,400	3,200	2,600	3,700	4,200	2,700	1,900
Chemistry	10,400	NA	NA	900	1,400	1,300	1,000	1,700	1,900	1,100	900
Geosciences	4,000	NA	NA	200	800	700	600	500	500	400	300
Physics/astronomy	8,500	NA	NA	300	1,100	1,000	900	1,400	1,800	1,100	700
Other physical sciences	300	NA	NA	NA	100	100	100	NA	NA	NA	NA
Social sciences	52,800	NA	200	2,800	5,200	7,600	9,700	10,700	8,800	4,700	3,100
Economics	9,700	NA	100	800	1,100	1,500	2,000	1,500	1,600	800	500
Political sciences	8,300	NA	100	500	700	1,300	1,200	1,900	1,300	700	600
Psychology	17,100	NA	NA	900	1,800	2,400	3,200	3,800	2,300	1,500	1,000
Sociology/anthropology	11,400	NA	NA	400	1,000	1,500	2,300	2,100	2,400	1,000	700
Other social sciences	6,300	NA	NA	200	600	900	1,100	1,300	1,300	600	300

NA = data not available

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See figure 3-13 in Volume 1.

Appendix table 3-22.
Older S&E degreed individuals working full-time: 1997
(Percent)

Age	Highest degree		
	Bachelor's	Master's	Ph.D.
55	80.6	89.7	92.1
56	72.9	80.6	90.0
57	72.4	77.3	85.7
58	73.9	71.6	84.9
59	62.6	64.7	82.8
60	57.3	64.1	82.0
61	56.9	57.7	76.2
62	54.8	53.4	74.0
63	39.2	36.6	59.7
64	31.9	40.3	61.3
65	30.3	27.1	55.7
66	22.6	25.2	44.4
67	14.7	18.5	39.7
68	14.9	7.9	27.7
69	17.3	14.3	26.8
70	10.0	9.7	20.8

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See figure 3-14 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 3-23.
Number of foreign-born S&E degree holders, by place of birth: 1997

Country of birth	Number
India	184,900
China	131,300
Philippines	92,800
Germany	84,100
United Kingdom	74,600
Canada	72,700
Taiwan	68,100
Korea	53,000
Iran	48,300
Vietnam	45,500
Former Soviet Union	39,500
Japan	37,700
Mexico	35,100
Cuba	29,000
Poland	22,800
Italy	18,100
Pakistan	17,600
Jamaica	16,000
France	15,200
Colombia	14,500
Egypt	14,400
Lebanon	14,200
Israel	12,900
Greece	11,700
Argentina	10,900
Turkey	9,900
Netherlands	9,800
Romania	9,300
Nigeria	9,200
Peru	9,200
Hungary	9,200
Brazil	9,000
Panama	8,200
Thailand	8,000
Venezuela	7,900
Malaysia	7,100
Indonesia	6,600
Equador	6,500
Czechoslovakia	6,400
Dominican Rep	6,400
Spain	5,900
South Africa	5,700
Haiti	5,700
Austria	5,400
Ireland	5,400
Yugoslavia	5,300
Bangladesh	5,200
Sweden	3,900
Chile	3,300
Other foreign place of birth	160,200

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See figure 3-15 in Volume 1.

Appendix table 3-24
INS permanent visas issued, by S&E occupation (thousands)

Year	Total, all immigrant S&Es	Engineers	Natural scientists	Mathematical scientists, and computer specialists	Social scientists
1988	11.0	8.1	1.2	1.2	0.5
1989	11.8	8.7	1.2	1.5	0.4
1990	12.6	9.3	1.2	1.6	0.5
1991	14.1	10.5	1.3	1.7	0.6
1992	22.9	15.6	2.8	3.4	1.1
1993	23.6	14.5	3.9	4.2	1.0
1994	17.2	10.7	3.1	2.8	0.7
1995	14.1	9.0	2.4	2.1	0.6
1996	19.4	11.6	3.7	3.3	0.8
1997	17.1	10.3	3.5	2.6	0.7
1998	13.5	7.9	2.5	2.5	0.6

SOURCE: Immigration and Naturalization Service Administrative Records.

See figure 3-16 in Volume 1.

Appendix table 3-25
Scientists and engineers engaged in R&D, and per 10,000 labor force population, by country: 1979–97

Year	United States	Japan	Germany	France	United Kingdom	Italy	Canada
			Thousands				
1979	614.5	291.2	116.9	72.9	NA	46.4	NA
1980	651.1	303.2	120.7	74.9	NA	47.0	NA
1981	683.2	311.0	124.7	85.5	127.0	52.1	40.5
1982	711.8	321.0	NA	90.1	128.0	56.7	44.1
1983	751.6	347.4	130.8	92.7	127.0	63.0	45.6
1984	NA	357.4	NA	98.2	129.0	62.0	48.7
1985	801.9	380.3	143.6	102.3	131.0	63.8	52.5
1986	NA	393.0	NA	105.0	134.0	67.8	56.0
1987	877.8	415.6	165.6	109.4	134.0	70.6	58.3
1988	NA	434.6	NA	115.2	137.0	74.8	60.6
1989	924.2	457.5	176.4	120.4	133.0	76.1	62.0
1990	NA	477.9	NA	123.9	133.0	77.9	65.8
1991	960.4	491.1	241.9	129.8	131.0	75.2	65.2
1992	NA	511.4	234.3	141.7	134.0	74.4	73.1
1993	962.7	526.5	229.8	145.9	140.0	74.4	76.6
1994	NA	541.0	NA	149.2	146.0	75.7	NA
1995	987.7	552.0	231.1	151.2	148.0	75.5	82.2
1996	NA	617.3	NA	154.8	146.0	76.4	80.5
1997	1,114.1	625.4	NA	NA	NA	NA	NA
			Per 10,000 labor force				
1979	57.7	51.3	43.4	31.4	NA	20.8	NA
1980	60.0	53.1	44.3	32.1	NA	20.8	NA
1981	61.9	54.5	44.0	36.3	47.5	22.9	33.8
1982	63.6	55.6	NA	37.9	48.0	24.9	36.8
1983	66.4	59.0	45.7	39.1	47.7	27.3	37.4
1984	NA	60.3	NA	41.1	47.3	26.6	39.3
1985	68.4	63.9	49.7	42.8	47.3	27.1	41.7
1986	NA	65.3	NA	43.7	48.2	28.4	43.7
1987	72.2	68.8	56.4	45.4	47.9	29.4	44.6
1988	NA	70.5	NA	47.6	48.5	30.9	45.4
1989	73.6	73.0	59.2	49.6	46.8	31.4	45.6
1990	NA	74.9	NA	49.9	46.7	31.8	46.4
1991	75.7	75.5	61.5	51.8	46.3	30.6	47.1
1992	NA	77.7	59.3	56.4	46.9	30.2	50.2
1993	74.3	79.6	58.0	57.9	49.2	32.6	52.0
1994	NA	81.4	NA	58.8	51.3	33.3	NA
1995	74.7	82.8	58.5	59.6	52.1	32.5	53.6
1996	NA	92.0	NA	60.5	51.1	32.7	NA
1997	81.8	92.2	NA	NA	NA	NA	NA

NA = not available

SOURCE: Organisation for Economic Co-operation and Development, Main Statistics database (Paris: 1999)

See figures 3-17 and 3-18 in Volume 1.

Appendix table 3-26.
Science and engineering trained R&D workers: 1997
(Percent)

Degree level	
Bachelor's	55.5
Master's	28.5
Professional	2.9
Doctorate	13.0
All Degree Levels	100.0
Field of highest degree	
Engineering	34.9
Life sciences	13.4
Math/computer sciences	11.6
Physical sciences	10.2
Social sciences	17.0
Non-S&E fields	13.0
All fields of degree	100.0

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See figures 3-6 and 3-7 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 3-27.
Employed U.S. scientists and engineers, percent with Research and Development as a primary or secondary work activity, by degree level and field of highest degree: 1997

Field of highest degree	Employed S&Es, total	Year since degree: 1–5 years	6–10 years	11–15 years	16–20 years	21–25 years	26–30 years	31–35 years	36+ years
All degree levels									
All science & engineering	30.8	35.4	35.2	32.8	29.3	24.0	25.9	26.3	25.6
Engineering	49.4	60.8	55.6	49.9	47.1	42.6	43.6	37.8	34.4
Aerospace engineering	45.3	59.6	54.0	40.0	38.9	25.2	45.7	—	—
Chemical engineering	55.7	66.3	68.3	48.2	52.1	52.6	55.4	41.7	45.2
Civil engineering	39.6	51.3	50.3	43.2	37.0	32.5	28.3	27.6	31.1
Electrical engineering	53.6	62.7	57.6	56.0	52.3	50.6	42.3	40.7	33.8
Industrial engineering	33.7	40.5	40.6	30.0	24.4	31.6	33.0	—	24.5
Mechanical engineering	57.2	67.8	61.0	59.8	58.3	51.2	54.1	45.5	39.1
Other engineering	45.0	62.1	49.6	41.3	44.7	35.6	46.8	29.0	29.8
Life Sciences	31.0	42.5	40.1	31.0	27.4	23.1	20.4	19.2	18.9
Agriculture	24.9	35.3	38.8	25.1	24.7	18.2	10.0	20.1	12.2
Biological sciences	33.1	44.5	41.4	33.1	29.2	25.5	22.4	18.3	22.3
Health/Medical	25.7	36.0	30.3	30.0	19.2	12.4	27.2	—	—
Computer math sciences	31.0	36.3	33.3	32.7	29.4	26.6	24.4	18.6	20.1
Computer sciences	34.9	39.3	35.1	34.2	29.7	31.8	23.8	—	—
Mathematical sciences	26.4	30.8	28.8	28.7	29.1	24.2	24.4	18.9	19.7
Physical sciences	46.0	56.9	50.6	42.7	47.6	39.2	39.3	43.0	38.8
Chemistry	47.3	62.7	54.8	43.8	50.8	40.0	37.2	38.7	37.0
Geosciences	39.0	50.7	43.3	32.1	36.5	33.7	33.4	54.7	36.9
Physics/astronomy	56.7	62.0	60.3	57.0	60.3	49.5	54.6	52.3	50.4
Other physical sciences	29.4	25.6	26.7	47.6	41.4	—	—	—	—
Social sciences	15.6	17.8	16.5	17.1	15.4	12.3	13.0	13.8	12.6
Economics	16.6	22.4	15.6	16.8	13.7	15.7	16.7	17.4	5.3
Political sciences	16.3	18.1	17.6	20.6	18.3	8.9	11.3	13.4	18.1
Psychology	14.4	15.4	14.2	13.3	14.3	12.9	16.3	15.2	12.7
Sociology/Anthropology	14.6	16.1	19.8	16.8	15.0	11.5	9.8	13.4	15.2
Other social sciences	18.9	23.9	19.6	26.4	18.3	13.5	11.0	8.2	15.4
Bachelor's									
All science & engineering	25.8	28.9	30.2	28.9	25.2	19.3	20.9	20.6	22.1
Engineering	45.1	56.0	52.4	46.6	43.6	38.2	39.9	32.8	32.7
Aerospace engineering	41.3	51.8	49.4	37.7	35.5	—	—	—	—
Chemical engineering	50.8	60.4	64.4	40.2	49.5	48.8	52.0	35.8	41.5
Civil engineering	36.1	47.8	47.2	42.1	33.7	27.1	25.3	19.0	30.0
Electrical engineering	48.7	56.6	53.9	52.0	50.5	46.0	37.0	35.4	29.4
Industrial engineering	29.7	36.7	34.4	26.2	18.2	—	—	—	—
Mechanical engineering	54.7	63.8	60.2	58.3	54.8	47.6	54.4	44.0	37.9
Other engineering	37.6	58.4	44.4	34.9	37.6	25.9	41.4	16.9	27.9
Life Sciences	23.2	35.4	30.6	19.9	20.9	17.0	13.2	9.7	13.5
Agriculture	18.2	27.6	27.8	18.7	19.7	13.1	4.2	—	10.7
Biological sciences	25.0	37.0	32.6	19.2	21.8	19.5	14.8	9.1	14.3
Health/Medical	20.6	32.8	—	28.7	17.3	6.6	—	—	—
Computer math sciences	27.8	30.8	31.8	31.1	25.6	23.9	20.7	15.6	13.8
Computer sciences	33.7	35.0	34.8	33.8	27.3	34.4	—	—	—
Mathematical sciences	21.2	24.2	24.6	23.2	23.7	19.5	19.3	15.7	13.5
Physical sciences	36.5	45.8	41.8	31.2	39.5	32.3	30.2	33.0	30.0
Chemistry	37.9	53.1	46.4	28.4	41.3	33.7	28.2	29.0	29.2
Geosciences	31.1	39.4	34.9	27.0	31.4	26.1	—	—	—
Physics/astronomy	47.0	48.5	50.2	39.6	51.4	44.8	52.7	—	—
Other physical sciences	25.7	20.4	—	—	—	—	—	—	—
Social sciences	12.9	14.7	13.6	14.9	13.1	9.5	10.6	11.4	10.1
Economics	12.1	17.1	12.0	12.5	9.6	9.0	11.4	14.1	4.4
Political sciences	14.1	15.6	15.6	18.1	16.6	7.0	9.1	10.1	13.4
Psychology	12.3	13.0	12.3	11.6	12.1	11.1	15.2	—	9.2
Sociology/Anthropology	11.4	12.4	13.6	12.7	12.0	9.6	7.9	11.7	—
Other social sciences	16.0	19.7	15.3	26.2	18.0	9.3	9.9	8.0	—

Appendix table 3-27.
Employed U.S. scientists and engineers, percent with Research and Development as a primary or secondary work activity, by degree level and field of highest degree: 1997

Field of highest degree	Employed S&Es, total	Year since degree: 1–5 years	6–10 years	11–15 years	16–20 years	21–25 years	26–30 years	31–35 years	36+ years
Master's									
All science & engineering	37.1	47.6	40.5	35.4	31.9	29.1	29.3	36.0	37.1
Engineering	56.9	65.6	59.4	57.8	54.3	49.0	48.7	50.1	44.0
Aerospace engineering	48.4	69.0	62.0	—	—	—	—	—	—
Chemical engineering	66.3	79.4	72.9	77.1	—	—	—	—	—
Civil engineering	48.3	55.5	58.7	45.4	47.4	46.7	29.4	—	—
Electrical engineering	63.7	70.0	62.8	66.5	54.7	63.3	55.9	61.1	—
Industrial engineering	43.9	43.4	56.5	—	—	—	—	—	—
Mechanical engineering	65.0	77.3	60.3	64.3	74.4	62.2	51.3	—	—
Other engineering	49.3	59.4	49.3	48.0	49.9	40.2	48.3	—	—
Life Sciences	36.5	53.0	44.9	40.2	29.3	28.8	17.3	27.8	—
Agriculture	40.8	53.2	55.4	—	—	—	—	—	—
Biological sciences	35.5	56.2	39.8	44.5	30.0	26.4	17.1	—	—
Health/Medical	36.0	38.4	—	—	—	—	—	—	—
Computer math sciences	34.7	44.1	32.9	34.3	33.6	27.2	27.8	—	—
Computer sciences	35.7	45.0	33.4	34.1	33.7	26.8	—	—	—
Mathematical sciences	33.2	41.7	31.2	35.0	33.5	27.6	31.9	—	—
Physical sciences	48.0	66.3	48.2	46.7	46.6	33.3	36.3	51.9	53.9
Chemistry	49.9	69.4	54.8	48.6	—	38.2	—	—	—
Geosciences	43.4	63.2	45.2	33.6	39.7	—	—	—	—
Physics/astronomy	54.1	73.6	58.7	—	—	34.1	—	—	—
Other physical sciences	37.8	—	—	—	—	—	—	—	—
Social sciences	18.4	26.2	20.5	15.7	15.3	15.0	13.8	14.6	22.1
Economics	25.6	37.7	—	—	—	—	—	—	—
Political sciences	23.6	30.1	26.2	—	21.5	9.5	—	—	—
Psychology	13.9	19.2	14.0	11.2	13.5	12.6	11.9	—	—
Sociology/Anthropology	27.5	37.2	—	—	—	—	—	—	—
Other social sciences	21.8	33.9	23.5	—	12.2	—	—	—	—
Doctorate									
All science & engineering	64.6	72.4	69.4	64.0	61.4	57.6	57.6	62.1	61.7
Engineering	75.7	85.9	78.1	76.8	75.6	65.2	65.3	70.0	66.8
Aerospace engineering	85.4	90.3	91.6	—	—	—	—	—	—
Chemical engineering	75.3	91.3	84.5	77.6	70.6	71.3	62.6	—	—
Civil engineering	67.1	83.8	70.9	57.7	—	49.3	—	—	—
Electrical engineering	76.3	86.3	81.7	80.0	77.9	60.6	58.7	—	—
Industrial engineering	61.5	70.5	56.2	—	—	—	—	—	—
Mechanical engineering	80.1	89.2	82.6	86.7	—	77.8	—	—	—
Other engineering	76.4	84.1	74.5	78.8	77.6	70.4	67.3	—	—
Life Sciences	68.0	76.7	74.8	68.3	66.6	58.5	58.9	60.2	56.9
Agriculture	70.0	77.2	79.4	70.6	70.8	61.5	54.6	65.9	—
Biological engineering	67.9	76.9	74.0	67.9	65.7	58.9	59.9	58.9	56.7
Health/Medical	66.2	67.2	82.4	71.6	—	41.9	—	—	—
Computer math sciences	68.5	74.3	74.7	75.0	62.4	62.9	56.6	56.7	—
Computer sciences	71.8	76.6	73.6	68.1	—	—	—	—	—
Mathematical sciences	67.4	72.2	75.5	78.2	64.9	62.8	56.6	56.7	—
Physical sciences	73.7	83.1	79.2	79.1	73.4	66.3	61.7	68.8	72.5
Chemistry	72.3	87.1	77.3	77.4	74.5	62.3	58.4	62.3	68.8
Geosciences	76.6	82.0	77.3	77.8	66.9	74.8	72.1	89.1	—
Physics/astronomy	75.1	79.1	82.5	82.5	76.1	67.5	63.9	73.2	77.8
Other physical sciences	64.0	—	—	—	—	—	—	—	—
Social Sciences	46.4	51.4	48.0	43.7	42.8	45.3	45.1	48.9	42.9
Economics	68.4	86.0	78.8	70.8	58.8	58.9	54.6	—	—
Political sciences	52.3	59.9	59.1	60.5	44.9	50.4	39.3	—	—
Psychology	34.1	36.2	32.3	31.4	33.3	31.6	37.3	42.8	41.5
Sociology/Anthropology	60.4	67.6	68.7	55.2	52.4	61.4	62.0	—	—
Other social sciences	57.1	65.5	63.5	46.3	52.1	62.5	52.3	—	—

— Data not available

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Scientists and Engineers Statistical Data System (SESTAT), 1997.

See figure 3-8 in Volume 1.

Appendix table 3-28.
Total science and engineering jobs: 1998 and projected 2008
(Numbers in thousands of jobs)

Occupation	1998	2008	Change
Total, all occupations	140,514	160,795	20,281
All science & engineering	3,809	5,747	1,937
Scientists	2,347	3,995	1,647
Life scientists	173	219	45
Agriculture and food scientists	21	24	2
Biological scientists	81	109	28
Conservation scientists and foresters	39	46	7
Medical scientists	31	39	8
All other life scientists	1	1	-
Computer, mathematical, and operations research occupations	1,653	3,182	1,529
Actuaries	16	17	1
Computer systems analysts, engineers, and scientists	1,530	3,052	1,522
Computer engineers and scientists	914	1,858	944
Computer engineers	299	622	323
Computer support specialists	429	869	439
Database administrators	87	155	67
All other computer scientists	97	212	115
System analysts	617	1,194	577
Statisticians	17	17	-
Mathematicians and all other mathematical scientists	14	13	(1)
Operations research analysis	76	83	7
Physical sciences	200	229	29
Atmospheric scientists	8	10	1
Chemists	96	110	13
Geologists, geophysicists, and oceanographers	44	51	7
Physicists and astronomers	18	18	-
All other physical scientists	33	41	8
Social scientists	321	365	44
Economists and marketing research analysts	70	83	13
Psychologists	166	185	19
Urban and regional planners	35	41	6
All other social scientists	50	56	6
Engineers	1,462	1,752	290
Aerospace engineers	53	58	5
Chemical engineers	48	53	5
Civil engineers	195	236	41
Electrical and electronics engineers	357	450	93
Industrial engineers, except safety engineers	126	142	16
Materials engineers	20	21	2
Mechanical engineers	220	256	36
Mining engineers, including mine safety engineers	4	4	(1)
Nuclear engineers	12	12	1
Petroleum engineers	12	12	-
All other engineers	415	509	94

- No change

( ) Decline

SOURCE: U.S. Bureau of Labor Statistics, Office of Employment Projections, "National Industry-Occupation Employment Projections 1998–2008" (Washington, DC: 1999).

See text table 3-20 in Volume 1.

Appendix table 4-1.
U.S. institutions of higher education, by type and control: 1953–94 (selected years)

Type	1953			1970			1976			1987			1994		
	Total	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private	Total	Public	Private
Total	1,871	667	1,204	2,837	1,322	1,515	3,072	1,466	1,606	3,389	1,548	1,841	3,596	1,576	2,019
Doctorate granting	131	69	62	173	109	64	184	119	65	213	134	79	236	151	85
Research universities I	NA	NA	NA	52	30	22	51	29	22	70	45	25	88	59	29
Research universities II	NA	NA	NA	40	27	13	47	33	14	34	26	8	37	26	11
Doctoral universities I	NA	NA	NA	53	34	19	56	38	18	51	30	21	51	28	23
Doctoral universities II	NA	NA	NA	28	18	10	30	19	11	58	33	25	60	38	22
Comprehensive universities & colleges	NA	NA	NA	456	309	147	594	354	240	595	331	264	529	275	254
Comprehensive I	NA	NA	NA	323	223	100	381	250	131	424	284	140	435	249	186
Comprehensive II	NA	NA	NA	133	86	47	213	104	109	171	47	124	94	26	68
Liberal arts colleges	713	82	631	721	32	689	583	11	572	572	32	540	637	86	551
Liberal arts colleges I	NA	NA	NA	146	2	144	123	0	123	142	2	140	166	7	159
Liberal arts colleges II	NA	NA	NA	575	30	545	460	11	449	430	30	400	471	79	392
Two-year institutions	521	295	226	1,063	808	255	1,146	909	237	1,367	985	382	1,471	963	508
Specialized institutions	191	45	146	424	64	360	559	70	489	642	66	576	693	72	621
Teachers' colleges	200	176	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Theological schools	115	0	115	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nontraditional/tribal colleges	NA	NA	NA	NA	NA	NA	6	3	3	NA	NA	NA	29	29	0

NA = not available

SOURCES: U.S. Department of Health, Education, and Welfare, *Biennial Survey of Education in the United States- 1952-54: Statistics of Higher Education: Faculty, Students, and Degrees 1953-54* (Washington, DC: U.S. Government Printing Office, 1956); and The Carnegie Foundation for the Advancement of Teaching, *A Classification of Institutions of Higher Education: 1994 Edition* (Princeton: The Carnegie Foundation, 1994).

See figure 4-1 in Volume 1.

Appendix table 4-2.
Enrollment in higher education, by Carnegie institution type: 1967–96

Year	Total	Research I	Research II	Doctorate - granting I	Doctorate - granting II	Compre- hensive I	Compre- hensive II	Liberal arts I	Liberal arts II	Two year	Specialized	Other	Not classified
1967	6,962,403	1,510,037	494,527	437,195	354,542	1,661,186	109,412	203,663	411,819	1,426,223	179,868	26,108	147,823
1968	7,570,446	1,564,981	517,844	455,455	389,249	1,813,749	119,881	209,398	431,621	1,709,796	187,241	27,560	143,671
1969	8,065,047	1,644,645	538,934	483,378	410,395	1,935,316	127,467	215,618	443,108	1,912,663	196,151	29,914	127,458
1970	8,648,124	1,748,776	570,365	509,450	436,660	2,071,472	137,127	221,996	452,087	2,180,252	209,720	32,862	77,357
1971	9,023,721	1,717,735	577,538	519,572	457,251	2,160,655	143,124	228,947	464,590	2,435,108	219,397	35,281	64,523
1972	9,296,311	1,768,282	581,139	521,856	466,371	2,183,621	142,270	233,939	464,218	2,609,721	229,979	31,451	63,464
1973	9,692,665	1,771,632	592,051	526,349	479,905	2,249,865	141,812	236,910	477,097	2,872,230	250,854	36,007	57,953
1974	10,319,864	1,826,768	612,510	545,772	497,963	2,324,124	153,182	238,868	494,426	3,272,215	271,195	34,553	48,288
1975	11,289,129	1,921,415	642,703	560,827	532,135	2,464,953	163,672	240,097	541,017	3,837,843	304,449	35,149	44,869
1976	11,120,093	1,893,269	613,142	568,570	526,247	2,415,834	168,445	240,730	551,890	3,755,311	307,803	33,066	45,786
1977	11,417,253	1,877,142	619,941	579,896	543,360	2,474,300	174,612	243,738	573,678	3,926,266	322,106	35,077	47,137
1978	11,391,377	1,864,590	626,213	581,343	542,558	2,452,812	178,964	251,607	579,494	3,910,980	334,175	34,665	33,976
1979	11,705,797	1,903,347	639,287	594,589	547,418	2,462,361	183,554	251,231	603,830	4,103,418	349,860	34,984	31,918
1980	12,234,644	1,947,444	655,874	604,769	570,666	2,531,409	188,971	260,645	633,712	4,404,276	371,317	35,861	29,700
1981	12,517,753	1,961,015	659,114	610,640	578,653	2,564,542	197,462	257,592	644,924	4,598,599	382,781	37,109	25,322
1982	12,588,520	1,933,340	650,946	606,683	582,638	2,570,690	200,403	252,029	651,192	4,671,136	398,143	37,800	33,520
1983	12,633,930	1,957,038	648,369	612,818	589,126	2,592,710	205,689	254,700	668,374	4,640,343	408,894	39,412	16,457
1984	12,400,392	1,952,748	644,056	604,742	591,400	2,576,072	203,725	253,604	656,099	4,456,709	410,816	38,571	11,850
1985	12,411,945	1,959,685	641,723	603,961	589,103	2,589,406	208,603	254,972	656,146	4,452,391	406,846	38,467	10,642
1986	12,670,121	1,988,839	653,298	609,772	590,694	2,629,336	210,267	257,998	657,695	4,600,773	409,815	39,097	22,537
1987	12,925,116	2,013,832	664,997	619,854	601,073	2,675,959	219,167	262,649	665,726	4,739,689	404,679	41,729	15,762
1988	13,205,540	2,029,065	685,731	631,073	608,663	2,738,439	227,937	269,151	693,086	4,844,655	422,610	39,953	15,177
1989	13,621,203	2,046,868	704,842	644,062	623,988	2,831,502	238,431	266,907	716,902	5,072,690	420,495	40,260	14,256
1990	13,983,255	2,080,412	714,852	657,824	635,833	2,926,402	243,690	268,223	732,654	5,220,767	442,352	42,149	18,097
1991	14,527,724	2,094,841	720,127	660,908	643,519	2,962,524	255,272	268,960	758,023	5,624,420	458,504	44,370	36,256
1992	14,657,118	2,089,045	714,126	655,985	649,549	2,964,105	259,253	266,735	781,247	5,695,378	482,482	46,705	52,508
1993	14,477,792	2,078,622	701,058	648,068	644,533	2,944,113	261,163	264,222	791,140	5,545,475	494,287	48,122	56,989
1994	14,449,476	2,079,559	694,454	639,831	650,816	2,927,198	266,854	264,737	797,156	5,499,655	502,124	49,764	77,328
1995	14,445,438	2,080,163	691,292	638,157	659,197	2,925,255	265,523	267,327	810,206	5,471,342	503,296	49,261	84,419
1996	14,481,915	2,082,713	684,608	632,288	661,015	2,926,182	267,133	269,258	814,037	5,494,333	514,538	50,151	85,659

SOURCES: National Center for Education Statistics, Enrollment Survey (Washington, DC: 1997); and National Science Foundation, Science Resources Studies Division, unpublished tabulations.

See figures 4-2, 4-3 and page 4-8 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 4-3.
Science and engineering degrees, by degree level and institution type: 1996

Institution type	Total degrees	Total science & engineering	Natural sciences[a]	Math & computer sciences	Social sciences[b]	Engineering	Engineering technology[c]
Bachelor's degrees							
Total	1,179,815	384,674	98,322	37,621	185,617	63,114	16,228
Research I	278,237	127,343	33,910	8,077	55,414	29,942	1,599
Research II	94,708	35,237	8,816	2,304	15,892	8,225	1,137
Doctorate - granting I	79,984	23,211	5,334	2,266	11,865	3,746	1,025
Doctorate - granting II	78,847	27,741	5,949	2,748	12,302	6,742	904
Comprehensive I	386,447	102,281	25,621	12,933	53,982	9,745	6,005
Comprehensive II	36,778	8,466	2,107	1,317	4,717	325	700
Liberal arts I	53,474	26,466	8,393	1,745	15,828	500	0
Liberal arts II	119,547	26,512	7,029	4,410	14,151	922	1,960
Two year	2,258	178	66	30	65	17	484
Specialized	43,756	4,494	714	1,641	363	1,776	2,260
Other	4,997	2,709	383	142	1,010	1,174	39
Not classified	782	36	0	8	28	0	115
Master's degrees							
Total	408,932	95,313	16,158	14,355	37,039	27,761	1,651
Research I	122,101	38,966	7,545	4,855	11,479	15,087	410
Research II	33,052	10,817	1,964	1,369	3,567	3,917	47
Doctorate - granting I	40,424	9,078	1,333	1,817	3,823	2,105	157
Doctorate - granting II	31,255	9,050	1,570	1,748	3,219	2,513	80
Comprehensive I	138,408	21,443	2,903	3,897	11,565	3,078	765
Comprehensive II	7,304	548	65	68	373	42	37
Liberal arts I	4,904	949	171	16	727	35	0
Liberal arts II	4,795	526	49	31	411	35	54
Specialized	22,670	2,133	500	478	516	639	50
Other	3,904	1,738	58	76	1,294	310	51
Not classified	115	65	0	0	65	0	0
Doctoral degrees							
Total	44,754	26,282	10,439	2,030	7,442	6,371	18
Research I	28,587	18,186	7,654	1,477	4,207	4,848	8
Research II	5,096	3,008	1,171	248	833	756	6
Doctorate - granting I	4,684	2,066	479	190	1,081	316	0
Doctorate - granting II	2,185	1,300	455	110	416	319	0
Comprehensive I	788	256	66	0	149	41	4
Comprehensive II	8	8	3	0	5	0	0
Liberal arts I	153	41	11	3	27	0	0
Liberal arts II	118	14	0	0	14	0	0
Specialized	2,235	704	599	0	51	54	0
Other	849	654	1	2	614	37	0
Not classified	51	45	0	0	45	0	0

[a]Natural sciences include physical, earth, atmospheric, oceanographic, biological, and agricultural sciences.

[b]Social sciences include psychology, sociology, and other social sciences.

[c]Engineering technology data are not included in "Total science and engineering."

SOURCES: National Center for Education Statistics, Completion Survey (Washington, DC: 1997); and National Science Foundation, Science Resources Studies Division, unpublished tabulations.

See figures 4-2, 4-4, and 4-5 in Volume 1.

Appendix table 4-4.
Institutions awarding science and engineering degrees, by degree level and institution type: 1996

Institution type	Total	Total science & engineering	Natural sciences[a]	Math & computer sciences	Social sciences[b]	Engineering	Engineering technology[c]
Bachelor's degrees							
Total	1,832	1,468	1,287	1,288	1,356	404	347
Research I	88	87	87	86	86	78	21
Research II	38	38	38	38	38	34	15
Doctorate - granting I	49	48	46	46	48	26	16
Doctorate - granting II	59	58	58	57	57	41	21
Comprehensive I	439	432	416	424	430	131	151
Comprehensive II	92	92	87	80	88	14	17
Liberal arts I	163	157	152	148	157	21	0
Liberal arts II	462	444	375	353	410	34	60
Two - year	53	13	1	7	5	1	15
Specialized	358	80	19	43	25	16	28
Other	20	16	8	4	11	8	2
Not classified	11	3	0	2	1	0	1
Master's degrees							
Total	1,337	764	474	435	625	267	78
Research I	87	87	87	84	87	79	11
Research II	38	38	38	38	38	33	6
Doctorate - granting I	49	49	46	45	46	21	8
Doctorate - granting II	59	59	54	48	54	35	5
Comprehensive I	437	348	190	185	293	70	40
Comprehensive II	90	31	7	6	18	3	2
Liberal arts I	58	25	12	5	18	2	0
Liberal arts II	166	29	4	2	25	3	2
Specialized	315	70	33	19	19	18	3
Other	35	26	3	3	25	3	1
Not classified	3	2	0	0	2	0	0
Doctoral degrees							
Total	489	333	262	170	261	173	5
Research I	88	88	88	81	87	79	3
Research II	38	38	38	35	37	32	1
Doctorate - granting I	50	50	39	26	46	18	0
Doctorate - granting II	59	55	45	26	39	28	0
Comprehensive I	83	35	15	0	19	8	1
Comprehensive II	2	2	1	0	1	0	0
Liberal arts I	11	5	2	1	4	0	0
Liberal arts II	5	1	0	0	1	0	0
Specialized	126	38	33	0	8	6	0
Other	25	20	1	1	18	2	0
Not classified	2	1	0	0	1	0	0

[a]Natural sciences include physical, earth, atmospheric, oceanographic, biological, and agricultural sciences.

[b]Social sciences include psychology, sociology, and other social sciences.

[c]Engineering technology data are not included in "Total science and engineering."

SOURCES: National Center for Education Statistics, Completion Survey (Washington, DC: 1997); and National Science Foundation, Science Resources Studies Division, unpublished tabulations.

See figure 4-2 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 4-5.
Science and engineering degrees earned by underrepresented minorities at the bachelor's level, by institution type: 1977, 1987, 1996

Institution type	Total S&E	Total underrepresented minorities			Black			American Indian/ Alaskan Native			Hispanic		
		Engineering	Natural sciences[a]	Social sciences[b]	Engineering	Natural sciences[a]	Social sciences[b]	Engineering	Natural sciences[a]	Social sciences[b]	Engineering	Natural sciences[a]	Social sciences[b]
						Number							
						1977							
Total	30,346	2,810	7,574	19,962	1,385	4,489	13,678	135	379	652	1,290	2,706	5,632
Research I	5,941	718	1,526	3,697	333	819	2,454	52	130	154	333	577	1,089
Research II	1,387	176	318	893	92	154	594	21	58	57	63	106	242
Doctorate - granting I	1,479	130	354	995	90	245	767	5	19	32	35	90	196
Doctorate - granting II	2,720	226	688	1,806	109	211	832	12	12	29	105	465	945
Comprehensive I	12,438	1,257	3,091	8,090	564	1,803	5,397	39	129	276	654	1,159	2,417
Comprehensive II	705	10	151	544	6	104	408	1	2	11	3	45	125
Liberal arts I	1,492	12	365	1,115	8	274	890	0	11	20	4	80	205
Liberal arts II	3,514	101	923	2,490	70	814	2,171	1	16	55	30	93	264
Specialized and other	670	180	158	332	113	65	165	4	2	18	63	91	149
						1987							
Total	30,939	5,079	11,607	14,253	2,315	6,524	8,391	210	423	657	2,554	4,660	5,205
Research I	8,446	2,065	2,270	4,111	999	1,160	2,317	80	115	199	986	995	1,595
Research II	1,571	361	425	785	208	233	491	20	32	47	133	160	247
Doctorate - granting I	1,731	300	614	817	176	395	503	9	24	24	115	195	290
Doctorate - granting II	2,709	421	1,107	1,181	174	365	454	17	27	58	230	715	669
Comprehensive I	10,595	1,594	4,415	4,586	593	2,539	2,565	68	167	244	933	1,709	1,777
Comprehensive II	681	8	359	314	7	171	215	0	4	12	1	184	87
Liberal arts I	1,722	25	601	1,096	18	353	734	1	20	29	6	228	333
Liberal arts II	2,812	52	1,463	1,297	33	1,116	1,087	2	23	30	17	324	180
Specialized and other	672	253	353	66	107	192	25	13	11	14	133	150	27
						1996							
Total	55,114	6,974	16,135	32,005	3,000	8,670	17,385	243	701	1,324	3,731	6,764	13,296
Research I	14,018	2,439	3,283	8,296	1,080	1,414	3,843	103	187	383	1,256	1,682	4,070
Research II	3,297	620	759	1,918	340	375	969	44	81	130	236	303	819
Doctorate - granting I	2,633	254	671	1,708	153	417	1,075	10	36	57	91	218	576
Doctorate - granting II	4,453	669	1,251	2,533	272	560	959	41	53	108	356	638	1,466
Comprehensive I	20,213	2,393	6,398	11,422	987	3,547	6,315	26	253	428	1,380	2,598	4,679
Comprehensive II	1,199	17	445	737	14	296	483	0	10	35	3	139	219
Liberal arts I	2,641	59	632	1,950	55	370	1,148	0	13	59	4	249	743
Liberal arts II	5,326	30	2,226	3,070	16	1,418	2,382	4	52	103	10	756	585
Specialized and other	1,334	493	470	371	83	273	211	15	16	21	395	181	139

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-5.
Science and engineering degrees earned by underrepresented minorities at the bachelor's level, by institution type: 1977, 1987, 1996

Institution type	Total S&E	Total underrepresented minorities			Black			American Indian/ Alaskan Native			Hispanic		
		Engineering	Natural sciences[a]	Social sciences[b]	Engineering	Natural sciences[a]	Social sciences[b]	Engineering	Natural sciences[a]	Social sciences[b]	Engineering	Natural sciences[a]	Social sciences[b]
						Percent							
						1977							
Research I	19.6	25.6	20.1	18.5	24.0	18.2	17.9	38.5	34.3	23.6	25.8	21.3	19.3
Research II	4.6	6.3	4.2	4.5	6.6	3.4	4.3	15.6	15.3	8.7	4.9	3.9	4.3
Doctorate - granting I	4.9	4.6	4.7	5.0	6.5	5.5	5.6	3.7	5.0	4.9	2.7	3.3	3.5
Doctorate - granting II	9.0	8.0	9.1	9.0	7.9	4.7	6.1	8.9	3.2	4.4	8.1	17.2	16.8
Comprehensive I	41.0	44.7	40.8	40.5	40.7	40.2	39.5	28.9	34.0	42.3	50.7	42.8	42.9
Comprehensive II	2.3	0.4	2.0	2.7	0.4	2.3	3.0	0.7	0.5	1.7	0.2	1.7	2.2
Liberal arts I	4.9	0.4	4.8	5.6	0.6	6.1	6.5	0.0	2.9	3.1	0.3	3.0	3.6
Liberal arts II	11.6	3.6	12.2	12.5	5.1	18.1	15.9	0.7	4.2	8.4	2.3	3.4	4.7
Specialized and other	2.2	6.4	2.1	1.7	8.2	1.4	1.2	3.0	0.5	2.8	4.9	3.4	2.6
						1987							
Research I	27.3	40.7	19.6	28.8	43.2	17.8	27.6	38.1	27.2	30.3	38.6	21.4	30.6
Research II	5.1	7.1	3.7	5.5	9.0	3.6	5.9	9.5	7.6	7.2	5.2	3.4	4.7
Doctorate - granting I	5.6	5.9	5.3	5.7	7.6	6.1	6.0	4.3	5.7	3.7	4.5	4.2	5.6
Doctorate - granting II	8.8	8.3	9.5	8.3	7.5	5.6	5.4	8.1	6.4	8.8	9.0	15.3	12.9
Comprehensive I	34.2	31.4	38.0	32.2	25.6	38.9	30.6	32.4	39.5	37.1	36.5	36.7	34.1
Comprehensive II	2.2	0.2	3.1	2.2	0.3	2.6	2.6	0.0	0.9	1.8	0.0	3.9	1.7
Liberal arts I	5.6	0.5	5.2	7.7	0.8	5.4	8.7	0.5	4.7	4.4	0.2	4.9	6.4
Liberal arts II	9.1	1.0	12.6	9.1	1.4	17.1	13.0	1.0	5.4	4.6	0.7	7.0	3.5
Specialized and other	2.2	5.0	3.0	0.5	4.6	2.9	0.3	6.2	2.6	2.1	5.2	3.2	0.5
						1996							
Research I	25.4	35.0	20.3	25.9	36.0	16.3	22.1	42.4	26.7	28.9	33.7	24.9	30.6
Research II	6.0	8.9	4.7	6.0	11.3	4.3	5.6	18.1	11.6	9.8	6.3	4.5	6.2
Doctorate - granting I	4.8	3.6	4.2	5.3	5.1	4.8	6.2	4.1	5.1	4.3	2.4	3.2	4.3
Doctorate - granting II	8.1	9.6	7.8	7.9	9.1	6.5	5.5	16.9	7.6	8.2	9.5	9.4	11.0
Comprehensive I	36.7	34.3	39.7	35.7	32.9	40.9	36.3	10.7	36.1	32.3	37.0	38.4	35.2
Comprehensive II	2.2	0.2	2.8	2.3	0.5	3.4	2.8	0.0	1.4	2.6	0.1	2.1	1.6
Liberal arts I	4.8	0.8	3.9	6.1	1.8	4.3	6.6	0.0	1.9	4.5	0.1	3.7	5.6
Liberal arts II	9.7	0.4	13.8	9.6	0.5	16.4	13.7	1.6	7.4	7.8	0.3	11.2	4.4
Specialized and other	2.4	7.1	2.9	1.2	2.8	3.1	1.2	6.2	2.3	1.6	10.6	2.7	1.0

[a]Natural sciences include physical, earth, atmospheric, oceanographic, biological, and agricultural sciences, mathematics, and computer sciences.

[b]Social sciences include psychology, sociology, and other social sciences.

SOURCES: National Center for Education Statistics, Completion Survey (Washington, DC: 1997); and National Science Foundation, Science Resources Studies Division, unpublished tabulations.

See text table 4-2 in Volume 1.

Appendix table 4-6.
Baccalaureate-origin institutions of 1991–95 science and engineering doctorate recipients, by Carnegie institution type

Field of doctorate	Total known Carnegie	Research universities	Doctoral universities	Comprehensive colleges and universities	Liberal arts colleges	Specialized institutions
			Number			
Science and engineering, total	76,599	42,757	8,626	12,589	11,556	1,071
Engineering, total	11,900	8,786	1,390	911	489	324
Chemical	1,714	1,355	200	80	51	28
Civil	1,015	715	135	85	51	29
Electrical	3,450	2,599	380	259	124	88
Mechanical	1,845	1,377	227	145	40	56
Other engineering	3,876	2,740	448	342	223	123
Sciences, total	64,699	33,971	7,236	11,678	11,067	747
Physical sciences, total	11,015	5,373	1,280	2,082	2,089	191
Chemistry	6,676	2,634	849	1,564	1,532	97
Physics and astronomy	4,267	2,692	425	511	549	90
Other physical sciences	72	47	6	7	8	4
Earth, atmospheric, & ocean sciences	2,526	1,433	267	357	437	32
Mathematics	2,496	1,344	276	387	432	57
Computer sciences	2,190	1,303	266	328	231	62
Biological & agricultural sciences, total	19,865	11,558	1,893	3,184	3,092	138
Biological sciences	17,222	9,777	1,674	2,763	2,875	133
Agricultural sciences	2,643	1,781	219	421	217	5
Psychology	14,953	6,925	1,956	3,306	2,647	119
Social sciences	11,654	6,035	1,298	2,034	2,139	148
			Percent			
Science and engineering, total	100.0	55.8	11.3	16.4	15.1	1.4
Engineering, total	100.0	73.8	11.7	7.7	4.1	2.7
Chemical	100.0	79.1	11.7	4.7	3.0	1.6
Civil	100.0	70.4	13.3	8.4	5.0	2.9
Electrical	100.0	75.3	11.0	7.5	3.6	2.6
Mechanical	100.0	74.6	12.3	7.9	2.2	3.0
Other engineering	100.0	70.7	11.6	8.8	5.8	3.2
Sciences, total	100.0	52.5	11.2	18.0	17.1	1.2
Physical sciences, total	100.0	48.8	11.6	18.9	19.0	1.7
Chemistry	100.0	39.5	12.7	23.4	22.9	1.5
Physics and astronomy	100.0	63.1	10.0	12.0	12.9	2.1
Other physical sciences	100.0	65.3	8.3	9.7	11.1	5.6
Earth, atmospheric, & ocean sciences	100.0	56.7	10.6	14.1	17.3	1.3
Mathematics	100.0	53.8	11.1	15.5	17.3	2.3
Computer sciences	100.0	59.5	12.1	15.0	10.5	2.8
Biological & agricultural sciences, total	100.0	58.2	9.5	16.0	15.6	0.7
Biological sciences	100.0	56.8	9.7	16.0	16.7	0.8
Agricultural sciences	100.0	67.4	8.3	15.9	8.2	0.2
Psychology	100.0	46.3	13.1	22.1	17.7	0.8
Social sciences	100.0	51.8	11.1	17.5	18.4	1.3

SOURCE: National Science Foundation, Science Resources Studies Division, *Undergraduate Origins of Recent (1991-95) Science and Engineering Doctorate Recipients, Detailed Statistical Tables*, NSF 96-334 (Arlington, VA: 1996).

See page 4-10 in Volume 1.

Appendix table 4-7.
Population of 20- to 24-year-olds in selected countries/regions: 1975–2010
(number in thousands)

Year	China	India	Western Europe	United States	Japan
1975	89,178	52,885	25,819	19,527	9,189
1976	88,370	54,634	26,075	19,922	8,916
1977	87,569	56,441	26,336	20,244	8,652
1978	86,776	58,308	26,602	20,505	8,395
1979	85,990	60,237	26,872	20,716	8,146
1980	85,211	62,229	27,146	21,584	7,904
1981	89,116	63,681	27,628	21,508	7,959
1982	93,201	65,167	28,121	21,433	8,015
1983	97,472	66,688	28,626	21,358	8,071
1984	101,940	68,244	29,143	21,283	8,127
1985	106,612	69,837	29,672	21,208	8,184
1986	110,434	71,349	29,575	20,700	8,329
1987	114,392	72,893	29,482	20,205	8,477
1988	118,493	74,470	29,391	19,721	8,628
1989	122,740	76,082	29,302	19,249	8,781
1990	127,140	77,729	29,356	18,788	8,937
1991	126,109	79,529	28,732	18,780	9,137
1992	125,086	81,372	28,096	18,771	9,342
1993	124,072	83,256	27,504	18,762	9,551
1994	123,066	85,185	26,937	17,853	9,765
1995	122,068	87,158	26,393	17,626	9,984
1996	116,094	87,594	25,824	17,501	9,664
1997	110,412	88,033	25,255	17,377	9,354
1998	105,008	88,473	24,686	17,254	9,054
1999	99,869	88,916	24,117	17,131	8,763
2000	94,981	89,361	23,548	17,010	8,482
2001	94,112	92,010	23,324	18,068	8,255
2002	93,251	94,738	23,100	18,292	8,035
2003	92,398	97,546	22,876	18,515	7,820
2004	91,553	100,438	22,652	18,739	7,611
2005	90,715	103,415	22,428	18,962	7,408
2006	95,379	104,983	25,482	19,038	7,282
2007	100,284	106,575	28,535	19,113	7,158
2008	105,440	108,190	31,589	19,189	7,036
2009	110,862	109,831	34,642	19,264	6,917
2010	116,562	111,496	37,696	19,340	6,799

SOURCES: U.S. Bureau of the Census, *Current Population Reports,* series P-25, nos. 519 and 917; and World Bank, Population and Human Resources Department, *Population Projections, 1992-1993 Edition* (Washington, DC).

See figure 4-6 in Volume 1.

Appendix table 4-8.
Percentage of freshmen intending to major in science and engineering, by field, sex, and race/ethnicity: 1972–98

Field and sex	1972	1974	1976	1978	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
All freshmen	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
White																							
Total intending S&E majors	31.4	35.4	33.9	32.6	31.9	31.7	32.4	33.4	32.7	31.6	29.5	28.6	28.1	30.6	30.0	31.7	32.2	33.0	32.7	31.9	33.6	32.5	30.3
Natural sciences[a]	9.7	13.9	14.0	10.6	9.0	8.9	7.9	8.9	9.2	8.7	7.9	7.4	7.5	7.8	8.4	9.2	10.3	11.1	12.7	12.7	12.2	11.4	9.9
Math & computer sciences	3.7	2.8	2.3	2.6	3.1	4.7	5.9	5.7	3.8	3.1	2.5	2.2	2.1	2.3	2.2	2.1	2.1	2.4	2.3	2.6	2.7	3.3	3.3
Social sciences[b]	11.4	10.9	9.0	9.1	8.4	7.2	7.0	7.3	8.7	9.1	8.9	10.4	10.3	11.2	10.6	9.8	10.4	10.2	9.8	9.3	9.8	9.2	9.4
Engineering	6.6	7.8	8.6	10.3	11.4	10.9	11.6	11.5	11.0	10.7	10.2	8.6	8.2	9.3	8.8	10.6	9.4	9.3	7.9	7.3	8.9	8.6	7.7
Males intending S&E majors	34.5	41.3	40.4	38.5	39.0	39.9	40.2	42.0	40.2	38.4	35.8	33.3	32.3	35.3	34.4	35.8	35.9	36.6	35.5	35.5	37.4	36.6	33.8
Natural sciences[a]	12.9	17.5	17.5	12.7	10.8	11.1	9.8	11.0	10.7	10.7	9.7	9.3	9.3	9.0	10.2	9.1	11.4	12.3	13.5	13.5	12.2	11.3	9.8
Math & computer sciences	3.8	3.4	2.7	3.0	3.7	5.6	6.6	6.6	4.9	4.0	3.3	3.2	3.0	3.4	3.0	3.0	2.9	3.5	3.5	4.3	4.3	5.5	5.7
Social sciences[b]	5.9	6.3	5.3	5.0	4.5	4.0	3.9	4.4	4.7	5.1	4.6	5.1	5.2	6.1	5.7	4.9	5.1	4.7	4.7	4.4	4.7	4.3	3.7
Engineering	11.9	14.1	14.9	17.8	20.0	19.2	19.9	20.0	19.9	18.6	18.2	15.7	14.8	16.8	15.5	18.8	16.5	16.1	13.8	13.3	16.2	15.5	14.6
Females intending S&E majors	20.1	21.3	21.2	21.6	20.6	21.6	22.2	22.8	22.1	22.4	20.5	21.4	21.3	23.6	22.7	24.8	24.7	25.8	26.1	26.0	26.9	26.1	23.9
Natural sciences[a]	5.8	9.6	9.6	8.1	6.7	6.7	5.9	6.8	7.0	7.0	6.1	5.6	5.8	6.6	6.2	9.1	8.8	9.9	11.4	12.3	11.9	11.5	10.0
Math & computer sciences	3.4	2.3	2.0	2.3	2.6	3.9	5.3	4.9	2.7	2.1	1.8	1.3	1.4	1.4	1.6	1.3	1.3	1.2	1.3	1.1	1.2	1.5	1.4
Social sciences[b]	10.8	9.3	7.7	8.7	8.2	7.4	7.5	7.4	9.6	10.2	10.0	12.3	11.7	12.8	11.9	11.3	11.5	11.1	10.4	10.4	10.9	10.1	10.1
Engineering	0.1	0.1	1.9	2.5	3.1	3.6	3.5	3.7	2.8	3.1	2.6	2.2	2.4	2.8	3.0	3.1	3.1	3.6	3.0	2.2	2.9	3.0	2.4
Asian American																							
Total intending S&E majors	40.9	49.1	49.8	45.9	48.4	47.6	49.8	50.1	48.7	50.9	46.1	46.9	44.4	43.1	42.6	44.0	43.4	42.5	44.4	40.3	42.6	43.9	43.4
Natural sciences[a]	11.1	22.5	20.3	16.1	11.9	12.7	13.3	15.0	15.2	15.9	14.5	15.1	14.6	11.9	12.8	14.7	16.1	16.2	16.4	15.3	16.2	13.6	13.8
Math & computer sciences	7.2	5.3	3.8	4.1	5.0	6.1	7.3	7.5	5.4	3.2	4.2	3.9	3.3	2.7	3.5	3.6	2.5	2.9	4.2	4.6	4.9	6.8	7.9
Social sciences[b]	8.2	7.9	7.9	6.5	5.9	5.7	6.2	6.1	6.5	7.5	6.8	8.2	9.5	9.3	9.4	8.3	8.2	8.7	7.5	7.0	7.4	6.7	7.1
Engineering	14.4	13.4	17.8	19.2	25.6	23.1	23.0	21.5	21.6	24.3	20.6	19.7	17.0	19.2	16.9	17.4	16.6	14.7	16.3	13.4	14.1	16.8	14.6
Males intending S&E majors	48.9	60.1	60.3	55.2	59.3	58.3	59.6	59.8	59.9	60.0	56.2	55.5	52.8	51.8	52.3	54.1	51.3	50.8	52.6	48.3	50.1	54.9	52.0
Natural sciences[a]	12.0	26.9	20.9	15.8	13.5	13.2	14.7	16.9	16.3	15.7	14.9	14.5	15.5	13.1	14.4	15.5	16.3	16.3	16.3	15.1	15.0	12.3	12.3
Math & computer sciences	6.1	5.4	3.8	4.0	3.8	5.4	5.7	6.6	6.6	5.5	3.1	4.4	4.6	3.9	3.1	4.7	4.8	3.6	4.1	5.8	6.5	7.3	10.2	11.9
Social sciences[b]	6.4	5.7	5.9	5.0	4.0	3.4	4.3	3.9	5.1	6.5	4.2	5.4	6.9	5.6	6.6	5.8	5.7	6.5	5.0	4.7	4.8	4.9	4.4
Engineering	24.4	22.1	29.7	30.4	38.0	36.3	34.9	32.4	33.0	34.7	32.7	31.0	26.5	30.0	26.6	28.0	25.7	23.9	25.5	22.0	23.0	27.5	23.4
Females intending S&E majors	30.1	36.6	38.3	36.7	34.7	36.3	40.0	39.5	37.4	40.2	36.0	37.4	35.7	34.7	33.2	34.3	35.7	34.2	35.7	32.7	34.9	33.6	35.3
Natural sciences[a]	9.7	17.4	19.6	16.5	10.1	11.9	11.7	12.9	14.0	16.2	14.3	15.5	13.7	11.4	11.1	14.3	15.7	15.8	16.7	15.8	17.0	14.9	15.0
Math & computer sciences	8.3	5.3	3.7	4.3	6.5	7.0	9.1	8.4	5.4	3.3	4.1	3.2	2.8	2.4	2.4	2.4	1.6	1.9	2.4	2.7	2.5	3.4	4.3
Social sciences[b]	10.2	10.9	10.0	8.0	7.6	7.9	8.7	8.1	7.6	8.4	9.5	11.1	12.6	13.5	12.2	10.9	10.9	10.7	10.0	9.2	10.0	8.6	9.6
Engineering	1.9	3.0	5.0	7.9	10.5	9.5	10.5	10.1	10.4	12.3	8.1	7.6	6.6	7.4	7.5	6.7	7.5	5.8	6.6	5.0	5.4	6.7	6.4

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-8.
Percentage of freshmen intending to major in science and engineering, by field, sex, and race/ethnicity: 1972–98

Field and sex	1972	1974	1976	1978	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Black																							
Total intending S&E majors	24.5	29.3	26.7	27.2	28.1	29.1	32.0	30.0	27.6	29.0	26.6	29.6	29.7	30.0	29.7	34.1	35.8	36.5	33.8	34.0	34.6	36.2	32.7
Natural sciences[a]	4.8	9.4	7.1	5.7	4.7	5.0	5.3	5.3	5.8	5.8	4.8	5.1	4.7	5.7	5.3	6.4	7.8	8.9	8.8	10.4	10.0	9.9	8.2
Math & computer sciences	3.2	2.2	1.5	2.6	4.7	6.8	8.3	9.0	6.9	7.0	4.5	4.4	4.0	4.4	4.5	5.0	4.7	4.8	4.5	5.3	5.5	6.3	7.2
Social sciences[b]	12.1	12.1	11.5	10.6	8.4	7.4	7.0	6.9	7.4	6.7	8.9	9.6	12.9	10.7	11.0	10.4	10.6	9.9	10.9	9.7	10.0	10.0	11.2
Engineering	4.4	5.6	6.6	8.3	10.3	9.9	11.4	8.8	7.5	9.5	8.4	10.5	8.1	9.2	8.9	12.3	12.7	12.9	9.6	8.6	9.1	10.0	6.1
Males intending S&E majors	30.3	34.5	34.2	33.1	34.8	35.9	38.5	35.7	33.5	34.8	31.8	35	34.1	34.2	32.8	39.7	41.8	42.8	38.1	37.7	37.2	41.5	34.1
Natural sciences[a]	6.2	9.6	10.4	6.0	5.0	5.7	5.8	6.2	6.3	5.8	5.0	5.3	5.7	5.2	5.7	6.0	7.7	8.5	8.1	9.3	7.7	8.7	6.8
Math & computer sciences	3.3	2.8	1.6	3.2	4.8	7.0	8.0	8.9	7.4	7.8	4.9	5.3	4.2	5.3	5.0	5.0	5.0	5.7	5.0	6.7	6.9	8.4	10.0
Social sciences[b]	11.0	11.5	9.6	8.4	6.5	6.0	5.4	5.3	7.0	5.3	7.1	6.9	9.7	7.7	7.4	7.4	8.0	7.4	8.0	6.2	6.2	6.7	7.1
Engineering	9.8	10.6	12.6	15.5	18.5	17.2	19.3	15.3	12.8	15.9	14.8	17.5	14.5	16.0	14.7	21.3	21.1	21.2	17.0	15.5	16.4	17.7	10.2
Females intending S&E majors	19.7	22.7	24.0	23.3	23.4	24.3	27.2	25.5	23.4	25.0	23.0	25.8	26.7	27.5	28.0	30.7	32.1	32.8	30.4	31.5	33.0	32.6	31.7
Natural sciences[a]	3.2	7.0	7.5	5.8	4.4	4.8	4.9	4.3	5.6	5.9	4.4	4.7	4.1	5.8	5.6	6.8	8.0	9.5	8.9	10.7	11.4	10.4	9.0
Math & computer sciences	3.1	1.6	1.4	2.3	4.6	6.6	8.5	9.1	6.6	6.5	4.3	3.8	3.8	4.0	4.1	5.0	4.5	4.2	4.2	4.5	4.7	5.0	5.4
Social sciences[b]	13.0	12.6	12.8	12.0	9.7	8.3	7.9	7.9	7.5	7.7	10.0	11.3	14.8	12.3	13.3	12.3	12.7	11.5	12.4	11.8	12.4	12.2	14.1
Engineering	0.4	1.5	2.3	3.2	4.7	4.6	5.9	4.2	3.7	4.9	4.3	6.0	4.0	5.4	5.0	6.6	6.9	7.6	4.9	4.5	4.5	5.0	3.2
Hispanic																							
Total intending S&E majors	29.6	37.4	32.0	27.2	35.1	34.3	32.9	34.1	32.2	36.5	34.7	34.1	30.5	32.6	33.4	30.0	33.4	34.2	37.8	36.4	35.0	36.0	32.5
Natural sciences[a]	5.5	13.8	11.6	6.8	8.9	9.3	6.8	8.4	8.1	8.8	8.6	8.2	6.8	7.3	7.4	7.4	8.8	9.4	10.2	10.1	9.9	10.5	9.2
Math & computer sciences	3.6	2.7	1.7	2.0	3.1	3.5	5.2	4.7	6.1	3.4	2.5	2.1	2.1	2.2	2.3	2.6	2.4	2.0	2.6	2.7	2.9	3.3	3.7
Social sciences[b]	13.2	13.3	10.6	9.4	10.4	7.4	9.0	8.3	7.8	11.5	11.4	12.5	12.6	12.8	12.8	9.7	12.0	12.5	13.6	12.5	12.1	11.6	11.0
Engineering	7.3	7.6	8.1	9.0	12.7	14.1	11.9	12.7	10.2	12.8	12.2	11.3	9.0	10.3	10.9	10.3	10.2	10.3	11.4	11.1	10.1	10.6	8.6
Males intending S&E majors	33.9	45.1	39.5	34	41.3	41.7	39.8	40.3	41.7	44.3	41.7	40.7	35.4	38.7	39.0	34.8	37.6	38.7	42.3	41.4	41.2	41.4	37.8
Natural sciences[a]	6.9	16.9	14.0	7.8	9.4	9.0	7.9	8.8	9.0	9.9	8.7	8.7	7.5	7.8	8.9	7.4	9.2	9.8	10.6	9.1	9.9	9.5	9.2
Math & computer sciences	4.3	2.8	2.6	3.3	2.7	4.0	5.1	5.5	7.7	4.6	3.0	2.5	2.7	2.8	2.7	3.6	3.2	2.8	4.0	3.9	4.3	5.1	4.9
Social sciences[b]	8.8	10.8	8.6	6.9	8.1	5.1	7.3	6.4	7.7	8.4	8.0	10.1	9.3	9.9	7.9	6.8	8.1	9.4	9.1	8.2	8.8	7.6	7.8
Engineering	13.9	14.6	14.3	16.0	21.1	23.6	19.5	19.6	17.3	21.4	22.0	19.4	15.9	18.2	19.5	17.0	17.1	16.7	18.6	20.2	18.2	19.2	15.9
Females intending S&E majors	24.5	29.9	24.0	21.0	30.0	26.9	26.6	28.7	24.5	30.0	29.0	28.9	26.7	28.2	28.9	25.7	29.5	29.6	34.7	32.0	30.1	31.8	28.6
Natural sciences[a]	3.8	10.7	8.9	6.1	8.7	9.4	5.6	8.0	7.4	7.8	8.6	7.8	6.1	7.0	6.2	7.9	8.4	8.7	10.2	11.0	9.6	11.3	9.4
Math & computer sciences	2.7	2.6	0.9	0.9	3.5	2.9	5.4	4.0	4.8	2.2	2.1	1.8	1.7	1.7	2.1	1.7	1.6	1.2	1.6	1.5	1.9	1.8	2.8
Social sciences[b]	18.0	16.0	12.8	11.9	12.4	9.2	10.5	10.3	7.9	14.1	14.2	14.7	15.3	15.3	16.2	12.4	15.3	15.3	17.2	16.0	14.6	14.7	13.6
Engineering	0.0	0.6	1.4	2.1	5.4	5.4	5.1	6.4	4.4	5.9	4.1	4.6	3.6	4.2	4.4	3.7	4.2	4.4	5.7	3.5	4.0	4.0	2.8

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-8.
Percentage of freshmen intending to major in science and engineering, by field, sex, and race/ethnicity: 1972–98

Field and sex	1972	1974	1976	1978	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
American Indian																							
Total intending S&E majors	29.1	35.4	30.5	32.0	34.0	26.8	27.7	26.1	27.1	26.4	29.6	30.7	30.8	32.7	30.9	30.3	30.9	30.8	29.4	29.8	32.2	33.8	31.7
Natural sciences[a]	9.8	16.4	13.7	9.3	7.6	6.6	6.7	6.7	9.2	6.9	7.7	8.4	7.4	6.5	10.6	8.4	9.1	9.5	9.9	11.3	11.8	11.4	10.3
Math & computer sciences	3.2	1.5	2.5	2.2	3.9	3.0	4.6	4.7	3.6	3.3	2.4	2.6	2.3	1.8	1.7	2.4	2.0	2.4	2.4	2.5	3.3	4.3	3.9
Social sciences[b]	10.4	10.6	7.8	10.2	9.2	7.0	5.9	5.9	6.6	9.5	9.5	9.7	12.6	13.9	10.6	9.6	10.6	10.6	10.3	9.6	10.2	10.7	11.2
Engineering	5.7	6.9	6.5	10.3	13.3	10.2	10.5	8.8	7.7	6.7	10.0	10.0	8.5	10.5	8.0	9.9	9.2	8.3	6.8	6.4	6.9	7.4	6.3
Males intending S&E majors	37.4	46.1	39.4	38.1	41.5	39.2	34.2	35.2	33.2	32.6	39.7	39.9	37.3	39.1	35.9	36.6	37.6	36.5	34.1	36.3	38.5	37.3	36.2
Natural sciences[a]	13.3	20.9	17.2	11.8	9.9	8.8	6.9	9.7	9.9	10.3	9.8	11.0	9.5	8.5	12.3	8.4	9.6	11.7	10.0	11.8	11.6	10.4	9.1
Math & computer sciences	3.9	1.8	3.4	1.9	4.8	4.7	6.1	5.1	3.5	4.6	3.0	3.4	3.4	2.0	2.2	3.3	3.0	2.8	3.5	4.3	5.7	6.5	7.1
Social sciences[b]	9.1	9.7	7.0	7.5	7.5	6.2	2.7	5.6	5.8	6.3	9.5	7.3	8.5	11.4	7.4	6.7	9.2	8.3	8.1	7.3	7.8	7.3	7.6
Engineering	11.1	13.7	11.8	16.9	19.3	19.5	18.5	14.8	14.0	11.4	17.4	18.2	15.9	17.2	14.0	18.2	15.8	13.7	12.5	12.9	13.4	13.1	12.4
Females intending S&E majors	21.7	25.4	21.8	25.9	26.7	15.6	22.4	18.8	22.1	20.6	21.4	23.7	25.6	28.1	26.8	25.5	25.5	26.5	26.5	25.2	27.5	30.9	28.4
Natural sciences[a]	6.7	12.0	10.6	6.9	5.3	4.5	6.7	4.6	9.0	3.9	5.9	6.6	5.7	5.2	9.1	8.5	8.4	7.8	10.0	11.0	11.7	12.2	11.1
Math & computer sciences	2.8	1.3	1.6	2.6	3.2	1.5	3.1	4.4	3.7	2.1	1.8	1.9	1.4	1.5	1.3	1.7	1.2	2.1	1.6	1.2	1.6	2.7	1.5
Social sciences[b]	11.6	11.1	8.5	12.8	11.3	7.7	8.9	6.1	7.4	12.1	9.5	11.4	16.1	15.6	13.0	11.9	11.8	12.2	12.1	11.2	11.7	12.9	13.7
Engineering	0.6	1.0	1.1	3.6	6.9	1.9	3.7	3.7	2.0	2.5	4.2	3.8	2.4	5.8	3.4	3.4	4.1	4.4	2.8	1.8	2.5	3.1	2.1

[a]Natural sciences here include physical, earth, atmospheric, oceanographic, biological, and agricultural sciences.

[b]Social sciences include psychology, sociology, and other social sciences.

SOURCE: University of California at Los Angeles, Higher Education Research Institute, *Survey of the American Freshman: National Norms* (Los Angeles: 1999), unpublished tabulations.

Appendix table 4-9.
Of freshmen intending to major in science and engineering, percentage by race/ethnicity and selected fields: 1971–98

Field/subfield	1971	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
White																								
All S&E fields	91.7	87.6	87.1	87.9	86.2	85.9	87.4	85.2	85.7	85.9	84.1	84.1	83.1	80.2	81.9	78.9	76.9	78.9	79.1	76.7	76.5	76.7	76.4	76.0
Physical sciences	94.5	89.5	90.5	91.4	89.9	90.0	89.9	87.9	89.5	89.0	85.1	87.4	87.3	87.7	86.0	86.5	82.5	83.8	82.6	80.3	82.7	81.2	82.2	82.2
Biological sciences	93.6	88.8	89.4	89.0	88.1	88.3	87.8	85.8	85.2	84.2	83.8	82.7	81.8	79.9	80.8	77.8	76.2	78.4	78.6	77.8	76.6	76.4	76.9	76.0
Social sciences	88.2	84.0	83.1	83.5	83.3	83.4	87.0	84.7	84.8	85.4	87.2	84.4	85.0	80.5	83.6	78.2	77.8	80.0	80.1	77.7	77.6	77.7	78.6	77.9
Engineering	93.2	88.8	88.0	89.2	86.7	86.1	87.5	85.8	87.3	87.8	83.4	84.1	81.6	80.2	81.1	79.3	76.1	77.2	77.3	73.8	74.3	76.0	75.1	76.3
Asian American																								
All S&E fields	0.8	1.8	1.8	1.8	2.2	2.2	2.0	2.5	2.8	2.7	4.4	4.6	4.8	5.2	4.8	5.3	6.0	5.8	5.7	7.9	7.0	6.8	7.9	7.8
Physical sciences	1.2	2.3	2.7	2.3	2.8	2.3	2.8	3.6	3.5	4.0	6.1	5.4	5.0	5.5	4.4	5.4	5.8	5.9	5.5	8.0	6.8	6.6	6.3	7.2
Biological sciences	0.7	2.1	2.1	2.3	2.2	2.5	2.5	3.2	4.2	3.9	6.6	7.1	7.7	8.6	7.0	7.7	9.2	8.4	8.1	9.8	8.6	8.5	8.5	9.0
Social sciences	0.5	0.9	1.0	1.0	0.9	1.1	1.1	1.6	1.4	1.6	2.5	2.5	2.8	3.4	3.1	3.7	4.2	3.8	4.5	5.0	4.8	4.6	4.9	4.8
Engineering	1.5	2.4	2.4	2.2	3.1	2.9	2.7	3.0	3.4	3.5	5.7	5.8	6.0	6.4	6.4	6.4	6.7	6.9	6.3	10.5	8.9	8.0	10.3	9.8
Black																								
All S&E fields	6.6	8.5	8.6	8.2	9.1	9.7	8.6	10.4	9.7	9.5	9.4	8.6	9.6	11.6	10.3	12.1	13.2	11.2	11.4	11.1	11.5	11.7	11.5	11.6
Physical sciences	3.7	6.3	5.0	4.7	5.8	6.0	5.6	6.9	6.0	5.6	7.7	5.3	5.7	5.3	7.2	5.3	8.6	7.2	9.0	8.7	8.1	9.1	7.9	7.5
Biological sciences	4.7	6.9	6.2	6.3	6.7	7.0	7.1	8.9	7.9	9.5	6.8	6.8	7.6	8.1	9.0	10.2	10.0	8.9	9.2	8.4	10.6	10.3	10.4	10.3
Social sciences	10.3	12.5	12.8	12.7	12.7	12.4	10.1	10.7	11.9	11.4	8.9	10.3	9.7	13.0	10.2	14.1	13.7	11.5	10.9	12.1	11.5	12.8	12.2	13.3
Engineering	4.5	6.8	7.3	6.7	7.7	8.7	7.6	9.4	7.6	7.0	8.5	7.4	9.8	10.1	9.4	10.6	13.4	12.2	12.7	11.0	10.9	10.7	10.3	7.7
Hispanic																								
All S&E fields	0.6	1.3	1.9	1.4	2.0	1.6	1.3	1.8	1.3	1.2	1.6	2.1	1.9	2.3	2.3	2.5	2.7	4.1	4	4.9	5.1	5.2	5.0	5.6
Physical sciences	0.3	1.3	0.6	1.1	1.5	1.2	1.3	1.0	0.7	1.2	1.0	1.2	1.4	1.7	1.7	1.8	2.1	2.6	2.9	4.0	2.8	3.4	3.8	3.9
Biological sciences	0.6	1.9	1.9	1.9	2.2	1.9	2.6	2.0	1.8	1.9	1.8	2.2	2.2	2.7	2.2	2.5	2.8	4.2	5.9	4.1	4.5	4.6	4.9	5.4
Social sciences	0.9	1.8	2.6	2.0	2.6	2.1	1.4	2.0	1.5	1.2	1.5	2.1	1.9	2.5	2.4	2.7	2.9	4.9	7.5	5.6	6.1	5.8	5.7	6.6
Engineering	0.5	1.1	1.5	1.3	1.6	1.3	1.3	1.7	1.3	1.1	1.5	2.1	1.9	2.2	2.2	2.5	2.5	3.9	5.3	5.3	5.9	5.1	4.9	5.5
American Indian																								
All S&E fields	0.9	0.9	0.7	0.7	0.8	0.8	0.9	0.9	1.0	0.9	0.9	0.9	1.0	0.9	1.0	1.3	1.7	1.8	1.8	2.1	2.1	2.3	3.1	2.1
Physical sciences	0.8	1.2	0.5	0.6	1.0	0.6	0.8	0.9	1.3	0.6	0.8	1.1	1.1	0.8	0.9	2.1	1.5	1.5	1.3	2.1	2.2	2.9	3.4	2.2
Biological sciences	1.0	1.0	0.8	0.7	0.7	0.8	0.8	1.0	1.1	1.5	1.2	1.0	1.1	1.0	0.9	1.6	1.8	1.8	1.9	2.0	2.3	2.3	3.2	2.2
Social sciences	1.0	1.0	0.8	0.8	0.8	0.9	1.1	0.9	1.4	0.6	0.9	1.0	1.0	0.9	1.2	1.3	1.9	1.8	2.3	2.2	2.5	2.2	3.5	2.4
Engineering	0.7	0.7	0.5	0.6	0.7	0.7	0.9	0.9	0.9	0.7	0.6	0.9	1.0	0.8	1.0	1.1	1.5	1.6	1.5	1.7	1.8	1.8	2.3	1.6

NOTE: Details may not add to totals because students may check more than one race/ethnicity, e.g., white and Hispanic.

SOURCE: University of California at Los Angeles, Higher Education Research Institute, *Survey of the American Freshman: National Norms* (Los Angeles: 1999), unpublished tabulations.

See page 4-11 in volume 1.

Appendix table 4-10.
High school mathematics and science courses reported by entering freshmen, percentage by race/ethnicity: 1984 and 1998

Race/ethnicity	Four years of high school math		Two to three years of physical sciences		Two to three years of biological sciences	
	1984	1998	1984	1998	1984	1998
White	59	71	50	50	34	41
Asian American	65	75	56	49	35	42
Black	50	67	40	31	31	30
Hispanic	51	65	42	39	24	35
American Indian	37	64	43	45	31	39

SOURCE: University of California at Los Angeles, Higher Education Research Institute, *Survey of the American Freshman: National Norms* (Los Angeles: 1999), unpublished tabulations.

See page 4-12 in Volume 1

Appendix table 4-11.
Level of proficiency in mathematics and science among 12th graders, percentage by race/ethnicity and sex: 1988 cohort in 1992

Race/ethnicity and sex	Below level 1	Level 1	Level 2	Level 3	Level 4 or 5
Proficiency in mathematics					
Total					
Underrepresented minority	10.9	37.5	19.5	18.2	13.9
Asian/Pacific Islander and white	6.4	18.7	13.5	24.7	36.7
Female	7.1	25.2	14	24.5	29.3
Male	7.6	20.9	15.6	22.2	33.7
Female					
Underrepresented minority	11.4	40.5	17.6	17.9	12.5
Asian/Pacific Islander and white	5.8	20.5	12.9	26.3	34.5
Male					
Underrepresented minority	10.3	34.4	21.4	18.5	15.4
Asian/Pacific Islander and white	6.9	17.1	13.9	23.2	38.9
Proficiency in science					
Total					
Underrepresented minority	31.8	37.1	23.4	7.7	
Asian/Pacific Islander and white	13.5	29.5	32.3	24.7	
Female	19.8	31.4	32.0	16.8	
Male	15.6	31.0	28.7	24.7	
Female					
Underrepresented minority	35.6	36.6	21.9	5.9	
Asian/Pacific Islander and white	15.0	29.8	35.1	20.2	
Male					
Underrepresented minority	28.0	37.6	24.9	9.5	
Asian/Pacific Islander and white	12.1	29.1	29.8	29.0	

NOTES: As a result of rounding, rows may not sum to 100 percent. The total sample size in the analysis is 16,489. Proficiency in science was measured on three levels.

SOURCE: National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88), unpublished tabulations.

See page 4-13 in Volume 1.

Appendix table 4-12.
Percentage of freshmen reporting need for remedial work in science or mathematics, by intended major and sex: 1977, 1989, 1997

Intended major	1977		1989		1997	
	Science	Math	Science	Math	Science	Math
Total						
S&E majors	8.3	20.1	8.8	20.5	9.5	21.6
Physical science majors	5.0	12.1	6.2	12.2	6.9	12.0
Biological science majors	6.6	22.5	10.6	23.3	10.2	23.3
Social science majors	11.3	28.3	9.1	26.3	10.8	28.6
Engineering majors	6.9	13.3	8.5	13.3	8.4	14.4
Non-S&E majors	11.5	24.7	10.8	24.4	11.2	25.5
Male						
S&E majors	6.0	16.0	8.1	15.4	7.0	16.4
Physical science majors	3.3	9.3	4.4	9.3	5.8	9.4
Biological science majors	5.1	19.9	6.6	19.2	7.4	18.1
Social science majors	7.5	22.4	7.0	21.2	7.0	21.5
Engineering majors	6.3	13.3	7.4	12.7	7.2	13.8
Non-S&E majors	7.3	20.4	8.5	20.6	8.7	21.2
Female						
S&E majors	12.0	26.9	11.2	26.9	12.3	27.5
Physical science majors	9.9	20.0	9.6	17.6	8.7	16.1
Biological science majors	8.4	25.5	10.4	26.9	11.9	26.6
Social science majors	14.1	32.6	10.6	30.0	13.1	32.9
Engineering majors	12.5	12.6	13.5	16.2	13.3	16.9
Non-S&E majors	15.0	28.2	12.5	27.2	13.0	28.4

SOURCE: University of California at Los Angeles, Higher Education Research Institute, *Survey of the American Freshman: National Norms* (Los Angeles: 1998), unpublished tabulations.

See figure 4-8 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 4-13.
Undergraduate enrollment in engineering and engineering technology programs: 1979–98

Enrollment	1979	1981	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Engineering																		
Total students	366,299	420,402	441,205	429,499	420,864	407,657	392,198	385,412	378,277	380,287	379,977	382,525	375,944	367,298	363,315	356,177	365,358	366,991
Total full time	340,488	387,577	406,144	394,635	384,191	369,520	356,998	346,169	338,529	338,842	339,397	344,126	337,817	328,463	325,489	317,772	326,458	329,657
Freshman	103,724	115,280	109,638	105,249	103,225	99,238	95,453	98,009	95,420	94,346	93,002	93,427	88,875	85,047	86,299	85,375	90,882	94,909
Sophomore	78,594	87,519	89,515	83,946	79,627	76,195	73,317	71,030	71,267	72,204	71,257	71,644	69,974	68,177	67,981	66,475	67,879	69,608
Junior	74,928	86,633	91,233	89,509	84,875	80,386	77,085	73,761	70,483	72,666	73,516	74,871	73,449	71,753	68,894	67,190	68,812	67,638
Senior	77,823	92,414	109,036	109,695	110,305	107,773	104,003	97,614	94,465	92,989	94,683	98,235	98,214	96,523	95,226	92,213	92,496	90,653
Fifth year	5,419	5,731	6,722	6,236	6,159	5,928	7,140	5,755	6,894	6,637	6,939	5,949	7,305	6,963	7,089	6,519	6,389	6,849
Total part time	25,811	32,825	35,061	34,864	36,673	38,137	35,200	39,243	39,748	41,445	40,580	38,399	38,127	38,835	37,826	38,405	38,900	37,334
Total schools	286	286	292	289	297	311	316	320	323	328	336	337	336	337	337	335	338	340
ABET-accredited schools[a]	239	250	258	258	264	270	277	281	284	289	303	309	310	315	316	317	319	321
Engineering technology																		
Total students	NA	191,152	163,226	157,897	123,571	137,390	128,501	131,704	127,687	123,217	127,135	124,736	106,976	107,275	105,809	105,345	108,459	108,993
Total full time	NA	134,444	112,745	111,446	83,038	90,536	80,600	79,624	76,179	72,390	75,340	73,245	65,581	66,457	63,929	62,330	67,864	68,545
First year	NA	65,893	53,032	46,806	34,389	39,177	32,685	33,477	32,225	30,178	31,302	30,543	24,824	24,574	25,665	26,583	30,227	28,367
Second year	NA	40,774	33,799	31,716	23,293	25,612	22,906	21,852	21,627	20,586	20,815	21,081	19,962	20,997	18,863	17,267	19,106	18,426
Other years assoc. BA of engineering tech.	NA	872	925	1,165	466	657	1,404	1,760	1,810	1,603	2,221	2,336	2,564	3,121	2,007	2,780	3,442	6,080
Third and later years	NA	26,905	24,989	31,759	24,890	25,090	23,605	22,535	20,517	20,023	21,002	19,285	18,231	17,765	17,394	15,700	15,089	15,672
Total part time	NA	56,708	50,481	46,451	40,533	46,854	47,901	52,080	51,508	50,827	51,795	51,491	41,395	40,818	41,880	43,015	40,595	40,448
Total schools	NA	NA	NA	NA	200	257	291	310	286	303	302	298	263	294	289	285	285	279

NA = not available

[a]Schools with at least one curriculum accredited by the Accreditation Board of Engineering and Technology (ABET).

SOURCE: American Association of Engineering Societies, Engineering Workforce Commission, *Engineering and Technology Enrollments, Fall 1998* (Washington, DC: 1999).

See page 4-13 in Volume 1.

Appendix table 4-14.
Engineering enrollment, by level and attendance pattern: 1979–98

Year	Undergraduate			Graduate		
	Total	Full time	Part time	Total	Full time	Part time
	Number					
1979	366,299	340,488	25,811	67,152	41,384	25,768
1980	397,344	365,117	32,227	72,585	44,335	28,250
1981	420,402	387,577	32,825	77,600	47,782	29,818
1982	435,330	403,390	31,940	81,999	50,410	31,589
1983	441,205	406,144	35,061	91,040	57,366	33,674
1984	429,499	394,635	34,864	93,165	57,277	35,888
1985	420,864	384,191	36,673	95,505	60,641	34,864
1986	407,657	369,520	38,137	107,196	67,333	39,863
1987	392,198	356,998	35,200	110,778	69,343	41,435
1988	385,412	346,169	39,243	112,007	69,226	42,781
1989	378,277	338,529	39,748	114,048	68,967	45,081
1990	380,287	338,842	41,445	117,834	72,456	45,378
1991	379,977	339,397	40,580	123,497	74,568	48,929
1992	382,525	344,126	38,399	128,854	78,651	50,203
1993	375,944	337,817	38,127	128,081	78,885	49,196
1994	367,298	328,463	38,835	122,242	74,596	47,646
1995	363,315	325,489	37,826	118,506	72,215	46,291
1996	356,177	317,772	38,405	113,063	70,129	42,934
1997	365,358	326,458	38,900	112,257	70,447	41,810
1998	366,991	329,657	37,334	110,355	69,519	40,836
	Percent					
1979	100.0	93.0	7.0	100.0	61.6	38.4
1980	100.0	91.9	8.1	100.0	61.1	38.9
1981	100.0	92.2	7.8	100.0	61.6	38.4
1982	100.0	92.7	7.3	100.0	61.5	38.5
1983	100.0	92.1	7.9	100.0	63.0	37.0
1984	100.0	91.9	8.1	100.0	61.5	38.5
1985	100.0	91.3	8.7	100.0	63.5	36.5
1986	100.0	90.6	9.4	100.0	62.8	37.2
1987	100.0	91.0	9.0	100.0	62.6	37.4
1988	100.0	89.8	10.2	100.0	61.8	38.2
1989	100.0	89.5	10.5	100.0	60.5	39.5
1990	100.0	89.1	10.9	100.0	61.5	38.5
1991	100.0	89.3	10.7	100.0	60.4	39.6
1992	100.0	90.0	10.0	100.0	61.0	39.0
1993	100.0	89.9	10.1	100.0	61.6	38.4
1994	100.0	89.4	10.6	100.0	61.0	39.0
1995	100.0	89.6	10.4	100.0	60.9	39.1
1996	100.0	89.2	10.8	100.0	62.0	38.0
1997	100.0	89.4	10.6	100.0	62.8	37.2
1998	100.0	89.8	10.2	100.0	63.0	37.0

SOURCE: American Association of Engineering Societies, Engineering Workforce Commission, *Engineering and Technology Enrollments, Fall 1998* (Washington, DC: 1999).

See figure 4-9 in Volume 1.

Appendix table 4-15.
Remedial mathematics courses in higher education, percentage by type of institution: 1995

	Institutions offering remedial coursework	Freshmen enrolled in remedial mathematics
Public		
Two year	99	34
Four year	78	18
Private		
Two year	62	23
Four year	51	9

SOURCE: National Center for Education Statistics (NCES), *The Condition of Education,* NCES 97-388 (Washington, DC: U.S. Government Printing Office, 1997); based on the NCES study "Remedial Education at Higher Education Institutions in Fall 1995."

See figure 4-10 in Volume 1. *Science & Engineering Indicators - 2000*

Appendix table 4-16.
Earned associate's degrees, by field and sex: 1975–96

Field	1975	1977	1979	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Total																			
All degrees	362,969	409,942	407,471	420,910	440,000	461,888	457,851	459,087	451,258	440,816	441,093	440,375	459,048	486,297	508,704	519,098	546,574	544,094	540,644
S&E	NA	NA	NA	NA	NA	23,796	28,095	26,486	25,267	23,130	21,520	19,733	19,810	19,352	22,722	23,420	25,581	24,228	24,600
Natural sciences[a]	NA	NA	NA	NA	NA	5,013	4,990	4,321	3,924	3,694	3,818	3,712	3,996	4,112	4,585	4,787	5,484	5,456	5,718
Math & computer sciences	NA	NA	NA	NA	NA	10,707	13,696	13,680	11,567	9,953	9,575	8,846	8,600	8,640	10,376	10,275	10,634	10,410	10,160
Social sciences[b]	NA	NA	NA	NA	NA	4,803	4,852	4,562	4,487	4,894	4,231	4,440	4,809	4,087	5,046	5,832	6,619	6,077	6,674
Engineering	NA	NA	NA	NA	NA	3,273	4,557	3,923	5,289	4,589	3,896	2,735	2,405	2,513	2,715	2,526	2,844	2,285	2,048
Engineering technology	30,906	38,588	41,716	52,478	58,574	51,317	50,671	53,667	49,880	49,815	49,646	48,342	46,938	45,106	40,592	40,946	42,414	39,190	35,982
Science technology	2,300	3,087	2,880	2,565	2,767	1,463	1,395	1,164	1,081	947	769	898	903	953	969	1,013	1,150	970	965
Male																			
All degrees	191,855	212,120	193,696	190,152	198,698	208,830	204,517	204,325	197,955	192,227	191,912	187,125	192,433	200,043	208,856	213,263	222,247	219,704	327,554
S&E	NA	NA	NA	NA	NA	13,145	15,689	14,695	14,403	13,152	12,266	10,607	10,568	10,360	12,063	12,103	13,023	12,461	12,393
Natural sciences[a]	NA	NA	NA	NA	NA	2,959	2,927	2,460	2,173	2,113	2,151	1,965	2,195	2,278	2,605	2,686	2,948	2,978	3,041
Math & computer sciences	NA	NA	NA	NA	NA	5,395	7,007	7,128	6,015	5,297	5,028	4,563	4,431	4,438	5,187	5,123	5,384	5,434	5,326
Social sciences[b]	NA	NA	NA	NA	NA	1,876	1,713	1,606	1,588	1,650	1,617	1,671	1,825	1,411	1,911	2,098	2,217	2,071	2,061
Engineering	NA	NA	NA	NA	NA	2,915	4,042	3,501	4,627	4,092	3,470	2,408	2,117	2,233	2,360	2,196	2,474	1,978	1,779
Engineering technology	29,108	34,957	36,749	45,329	50,823	45,521	45,068	47,946	44,340	44,158	44,053	42,766	41,435	39,777	35,666	36,129	36,899	34,196	30,947
Science technology	1,690	2,134	1,937	1,621	1,736	918	889	698	659	571	451	562	605	574	573	617	703	623	587
Female																			
All degrees	171,114	197,822	213,775	230,758	241,302	253,058	253,334	254,762	253,303	248,589	249,181	253,250	266,615	286,254	299,848	305,835	324,327	324,390	213,090
S&E	NA	NA	NA	NA	NA	10,651	12,406	11,791	10,864	9,978	9,254	9,126	9,242	8,992	10,659	11,317	12,558	11,767	12,207
Natural sciences[a]	NA	NA	NA	NA	NA	2,054	2,063	1,861	1,751	1,581	1,667	1,747	1,801	1,834	1,980	2,101	2,536	2,478	2,677
Math & computer sciences	NA	NA	NA	NA	NA	5,312	6,689	6,552	5,552	4,656	4,547	4,283	4,169	4,202	5,189	5,152	5,250	4,976	4,834
Social sciences[b]	NA	NA	NA	NA	NA	2,927	3,139	2,956	2,899	3,244	2,614	2,769	2,984	2,676	3,135	3,734	4,402	4,006	4,613
Engineering	NA	NA	NA	NA	NA	358	515	422	662	497	426	327	288	280	355	330	370	307	269
Engineering technology	1,798	3,631	4,967	7,149	7,751	5,796	5,603	5,721	5,540	5,657	5,593	5,576	5,503	5,329	4,926	4,817	5,515	4,994	5,035
Science technology	610	953	943	944	1,031	545	506	466	422	376	318	336	298	379	396	396	447	347	378

NA = not available

NOTE: Data on associate's degrees are not available for broad science and engineering fields before 1983.

[a]Natural sciences here include physical, earth, atmospheric, oceanographic, biological, and agricultural sciences.

[b]Social sciences include psychology, sociology, and other social sciences.

SOURCES: National Center for Education Statistics, Earned Degrees and Completion Surveys, unpublished tabulations; and National Science Foundation, Science Resources Studies Division, unpublished tabulations.

See page 4-15 in Volume 1.

Appendix table 4-17.
Earned bachelor's degrees, by field and sex: 1966–96 (selected years)

Field	1966	1971	1976	1981	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Total															
All degrees	524,008	846,110	934,443	946,877	1,000,204	1,003,532	1,006,033	1,030,171	1,062,151	1,107,997	1,150,072	1,179,278	1,183,141	1,174,436	1,179,815
Science and engineering	184,313	294,357	309,491	306,792	335,460	331,526	322,482	322,821	329,094	337,675	355,265	366,035	373,261	378,148	384,674
Natural sciences	46,978	67,238	91,547	84,062	72,499	68,724	64,734	62,860	62,652	65,189	71,269	77,312	83,791	90,845	98,322
Physical	15,462	17,948	16,497	17,446	15,784	15,464	14,255	14,148	13,425	13,678	13,875	14,188	14,655	14,897	15,396
Earth/atm/ocean	1,712	3,562	5,046	6,694	6,076	4,689	3,554	3,181	2,776	2,728	3,201	3,503	3,868	4,478	4,457
Biological & agricultural	29,804	45,728	70,004	59,922	50,639	48,571	46,925	45,531	46,451	48,783	54,193	59,621	65,268	71,470	78,469
Math/computer sciences	20,179	27,306	21,749	26,406	58,583	56,442	50,877	46,277	42,369	40,194	39,889	39,433	39,185	38,620	37,621
Mathematics	20,090	24,918	16,085	11,173	16,388	16,515	15,981	15,314	14,674	14,784	14,931	14,853	14,632	13,851	13,076
Computer sciences	89	2,388	5,664	15,233	42,195	39,927	34,896	30,963	27,695	25,410	24,958	24,580	24,553	24,769	24,545
Social and behavioral sciences	81,330	154,565	157,405	132,607	127,558	131,935	136,717	146,737	159,368	170,105	182,166	186,585	187,273	185,312	185,617
Psychology	16,966	38,154	50,363	41,364	40,937	43,195	45,378	48,954	54,018	58,893	64,033	67,251	69,768	72,601	73,828
Social sciences	64,364	116,411	107,042	91,243	86,621	88,740	91,339	97,783	105,350	111,212	118,133	119,334	117,505	112,711	111,789
Engineering	35,826	45,248	38,790	63,717	76,820	74,425	70,154	66,947	64,705	62,187	61,941	62,705	63,012	63,371	63,114
Chemical engineering	2,958	3,843	3,543	7,639	7,411	6,114	4,654	4,187	3,834	3,728	4,123	4,899	5,636	6,391	6,708
Civil engineering	5,588	6,879	8,493	11,331	9,223	8,746	8,131	8,015	7,992	8,083	8,920	9,788	10,603	11,329	12,053
Electrical engineering	10,978	12,212	9,874	15,040	26,112	26,791	25,942	24,318	2 3,015	21,520	20,256	19,598	18,241	17,579	16,667
Industrial engineering	2,325	3,190	2,241	3,878	4,255	4,313	4,259	4,121	4,041	3,820	4,029	3,584	3,453	3,519	3,727
Mechanical engineering	7,792	9,134	6,984	13,573	16,586	15,723	15,331	15,217	14,693	14,263	14,352	14,708	15,297	15,141	14,509
Other engineering	6,185	9,990	7,655	12,256	13,233	12,738	11,837	11,089	11,130	10,773	10,261	10,128	9,782	9,412	9,450
Engineering technology	NA	NA	NA	13,567	20,928	20,577	20,447	20,098	19,150	18,294	17,118	17,022	16,703	16,607	16,228
Male															
All degrees	301,037	478,423	508,549	474,336	490,143	485,003	481,236	487,566	495,867	508,952	525,395	537,536	537,061	531,146	528,000
Science and engineering	138,679	209,318	205,570	190,977	204,771	199,981	191,549	189,338	189,082	189,328	195,779	200,315	202,284	202,217	203,341
Natural sciences	37,180	53,208	65,572	53,430	43,405	40,589	36,930	36,009	35,157	36,206	38,939	42,316	45,600	48,474	51,766
Physical	13,290	15,317	13,280	13,137	11,088	10,792	9,673	9,777	9,106	9,253	9,289	9,424	9,588	9,605	9,694
Earth/atm/ocean	1,551	3,179	4,124	5,028	4,722	3,629	2,707	2,380	2,001	1,946	2,177	2,453	2,665	2,954	2,972
Biological & agricultural	22,339	34,712	48,168	35,265	27,595	26,168	24,550	23,852	24,050	25,007	27,473	30,439	33,347	35,915	39,100
Math/computer sciences	13,477	17,488	14,071	16,672	35,841	34,871	32,112	29,682	27,184	25,700	25,693	25,483	25,397	25,066	24,857
Mathematics	13,401	24,918	9,531	6,392	8,772	8,833	8,569	8,264	7,863	7,804	7,945	7,854	7,864	7,360	7,084
Computer sciences	76	2,388	4,540	10,280	27,069	26,038	23,543	21,418	19,321	17,896	17,748	17,629	17,533	17,706	17,773
Social and behavioral sciences	52,342	93,735	88,454	64,221	59,843	61,500	63,132	66,888	72,009	74,900	78,842	79,792	78,678	76,256	74,920
Psychology	10,038	21,117	22,987	14,447	12,691	13,399	13,584	14,291	15,399	16,155	17,130	18,029	18,749	19,638	19,965
Social sciences	42,304	72,618	65,467	49,774	47,152	48,101	49,548	52,597	56,610	58,745	61,712	61,763	59,929	56,618	54,955
Engineering	35,680	44,887	37,473	56,654	65,682	63,021	59,375	56,759	54,732	52,522	52,305	52,724	52,609	52,421	51,798
Chemical engineering	2,958	3,843	3,254	6,274	5,805	4,574	3,522	3,017	2,745	2,564	2,854	3,335	3,953	4,367	4,537
Civil engineering	5,588	6,879	8,493	10,100	7,994	7,550	6,960	6,841	6,730	6,803	7,395	8,009	8,619	9,031	9,629
Electrical engineering	10,978	12,212	9,681	13,940	22,885	23,227	22,418	21,130	20,148	18,757	17,801	17,339	15,990	15,409	14,695
Industrial engineering	2,325	3,190	2,154	3,111	2,974	2,929	3,014	2,860	2,835	2,723	2,890	2,547	2,439	2,493	2,630
Mechanical engineering	7,792	9,134	6,834	12,422	14,876	13,996	13,567	13,537	12,978	12,673	12,791	13,076	13,554	13,441	12,773
Other engineering	6,039	9,629	7,057	10,807	11,148	10,745	9,894	9,374	9,296	9,002	8,574	8,418	8,054	7,680	7,534
Engineering technology	NA	NA	NA	12,032	18,734	18,429	18,337	17,999	17,113	16,329	15,314	15,114	14,877	14,704	14,382

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-17.
Earned bachelor's degrees, by field and sex: 1966–96 (selected years)

Field	1966	1971	1976	1981	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
								Female							
All degrees	222,971	367,687	425,894	472,541	510,061	518,529	524,797	542,605	566,284	599,045	624,677	641,742	646,080	643,290	651,815
Science and engineering	45,634	85,039	103,921	115,815	130,689	131,545	130,933	133,483	140,012	148,347	159,486	165,720	170,977	175,931	181,333
Natural sciences	9,798	14,030	25,975	30,632	29,094	28,135	27,804	26,851	27,495	28,983	32,330	34,996	38,191	42,371	46,556
Physical	2,172	2,631	3,217	4,309	4,696	4,672	4,582	4,371	4,319	4,425	4,586	4,764	5,067	5,292	5,702
Earth/atm/ocean	161	383	922	1,666	1,354	1,060	847	801	775	782	1,024	1,050	1,203	1,524	1,485
Biological & agricultural	7,465	11,016	21,836	24,657	23,044	22,403	22,375	21,679	22,401	23,776	26,720	29,182	31,921	35,555	39,369
Math/computer sciences	6,702	9,818	7,678	9,734	22,742	21,571	18,765	16,595	15,185	14,494	14,196	13,950	13,788	13,554	12,764
Mathematics	6,689	9,494	6,554	4,781	7,616	7,682	7,412	7,050	6,811	6,980	6,986	6,999	6,768	6,491	5,992
Computer sciences	13	324	1,124	4,953	15,126	13,889	11,353	9,545	8,374	7,514	7,210	6,951	7,020	7,063	6,772
Social and behavioral sciences	28,988	60,830	68,951	68,386	67,715	70,435	73,585	79,849	87,359	95,205	103,324	106,793	108,595	109,056	110,697
Psychology	6,928	17,037	27,376	26,917	28,246	29,796	31,794	34,663	38,619	42,738	46,903	49,222	51,019	52,963	53,863
Social sciences	22,060	43,793	41,575	41,469	39,469	40,639	41,791	45,186	48,740	52,467	56,421	57,571	57,576	56,093	56,834
Engineering	146	361	1,317	7,063	11,138	11,404	10,779	10,188	9,973	9,665	9,636	9,981	10,403	10,950	11,316
Chemical engineering	23	64	289	1,365	1,606	1,540	1,132	1,170	1,089	1,164	1,269	1,564	1,683	2,024	2,171
Civil engineering	23	60	279	1,231	1,229	1,196	1,171	1,174	1,262	1,280	1,525	1,779	1,984	2,298	2,424
Electrical engineering	29	76	193	1,100	3,227	3,564	3,524	3,188	2,867	2,763	2,455	2,259	2,251	2,170	1,972
Industrial engineering	10	20	87	767	1,281	1,384	1,245	1,261	1,206	1,097	1,139	1,037	1,014	1,026	1,097
Mechanical engineering	19	43	150	1,151	1,710	1,727	1,764	1,680	1,715	1,590	1,561	1,632	1,743	1,700	1,736
Other engineering	42	98	319	1,449	2,085	1,993	1,943	1,715	1,834	1,771	1,687	1,710	1,728	1,732	1,916
Engineering technology	NA	NA	NA	1,533	2,194	2,148	2,110	2,099	2,037	1,965	1,804	1,908	1,826	1,903	1,846

NA = not available

SOURCES: National Center for Education Statistics, Earned Degrees and Completion Surveys, unpublished tabulations; and National Science Foundation, Science Resources Studies Division, *Science and Engineering Degrees 1966- 96*, NSF 99-330, Author, Susan T. Hill (Arlington, VA: 1999).

See figures 4-6, 4-11, and 4-28 in Volume 1.

Appendix table 4-18.
Ratio of first university degrees and science and engineering degrees to the 24-year-old population, in selected countries, by region: 1997 or most recent year

Region/country	All first university degrees	Total science & engineering	Degree fields: Natural sciences[b]	Degree fields: Social sciences[c]	Degree fields: Engineering	Number of 24-year-olds	Ratio of[a]: First univ. degrees to 24 year-old population	Ratio of[a]: NS&E degrees to 24 year-old population	Ratio of[a]: Social science degrees to 24 year-old population
Total, all regions[d]	6,355,621	2,650,756	863,456	908,851	878,449	71,129,549			
Asia									
Total, selected countries[d]	2,161,891	1,024,711	305,249	348,433	371,029	47,506,965	4.6	1.4	0.7
China	325,484	235,313	54,394	32,075	148,844	23,220,000	1.4	0.9	0.1
Hong Kong	11,362	5,425	2,370	1,233	1,822	93,000	12.2	4.5	1.3
India	750,000	176,036	147,036	NA	29,000	15,545,800	4.8	1.1	NA
Indonesia	144,314	97,095	10,711	65,740	20,644	3,975,065	3.6	0.8	1.7
Japan	524,512	348,897	32,327	213,619	102,951	1,870,700	28.0	7.2	11.4
Malaysia	10,511	4,760	1,685	2,198	877	331,600	3.2	0.8	0.7
Singapore	5,599	5,599	2,103	1,820	1,676	48,600	11.5	7.8	3.7
South Korea	196,566	91,278	33,345	16,624	41,309	843,500	23.3	8.9	2.0
Taiwan	74,255	29,140	10,982	5,130	13,028	360,900	20.6	6.7	1.4
Thailand	119,288	31,168	10,296	9,994	10,878	1,217,800	9.8	1.7	0.8
Middle East									
Total, selected countries[d]	283,901	79,079	37,447	15,556	26,076	3,875,735	7.3	1.6	0.4
Egypt[e]	85,608	13,578	6,710	1,437	5,431	976,200	8.8	1.2	0.1
Iran	49,296	18,274	6,364	4,330	7,580	1196600	4.1	1.2	0.4
Israel	14,253	7,317	1,939	3,616	1,762	110,600	12.9	3.3	3.3
Jordan	12,633	3,539	1,753	986	800	80,400	15.7	3.2	1.2
Kazakstan	45,536	13,252	6,779	952	5,521	290,600	15.7	4.2	0.3
Morocco	23,007	9,512	6,584	2,647	281	498,122	4.6	1.4	NA
Saudi Arabia	26,641	5,879	4,201	828	850	301,200	8.8	1.7	0.3
Syria	16,600	4,530	1,398	NA	3,132	257,600	6.4	1.8	NA
Tunisia	10,327	3,198	1,719	760	719	164,413	6.3	1.5	0.5
Sub-Saharan Africa									
Total, selected countries[d]	37,985	12,890	3,924	7,156	1,810	1,931,824	2.0	0.3	0.4
Ethiopia	2,440	966	488	240	238	928,214	0.3	0.1	0.0
South Africa	32,957	10,920	2,937	6,494	1,489	683,472	4.8	0.6	1.0
Uganda	2,588	1,004	499	422	83	320,138	0.8	0.2	0.1
Europe									
Total, selected countries[d]	1,866,416	800,214	277,990	195,406	326,818	9,780,505	19.1	6.2	2.0
European Union	1,070,238	430,927	161,981	129,926	139,020	4,975,100	21.5	6.1	2.6
Austria (long)	13,885	4,984	2,177	1,173	1,634	96,500	14.4	3.9	1.2
Belgium (long)	12,889	3,487	974	NA	2,513	129,400	10.0	2.7	NA
Denmark (short)	16,954	2,882	400	920	1,562	69,400	30.5	5.8	2.2
Denmark (long)	4,185	2,672	1,305	592	775				
Finland (short)	7,475	3,506	707	216	2,583	61,200	27.4	9.9	1.9
Finland (long)	9,324	3,674	1,401	919	1,354				
France (long)	108,825	77,820	23,951	31,041	22,828	821,800	13.2	5.7	NA
Germany (short)	75,641	43,807	6,273	12,719	24,815	874,900	24.3	8.1	4.7
Germany (long)	137,329	68,175	25,094	28,041	15,040				
Greece (long)	18,556	4,576	2,570	221	1,785	146,900	12.6	3.0	0.2
Ireland (short)	8,916	1,843	973	495	375	63,200	24.6	7.5	1.3
Ireland (long)	6,644	3,724	2,279	328	1,117				
Italy (short)	7,511	2,014	615	770	629	845,600	13.3	3.2	1.2
Italy (long)	104,877	34,505	15,239	9,107	10,159				
The Netherlands (long)	52,937	20,960	4,544	9,713	6,703	199,600	26.5	5.6	4.9
Portugal (short)	2,587	425	70	32	323	172,200	15.1	2.6	2.2
Portugal (long)	23,482	7,823	1,895	3,685	2,243				
Spain (short)	73,814	18,817	7,614	0	11,203	648,000	26.8	6.1	1.1
Spain (long)	100,055	27,950	15,314	7,444	5,192				
Sweden (short)	15,028	2,869	709	1,343	817	109,600	23.4	5.3	1.6
Sweden (long)	10,571	4,727	1,500	431	2,796				
United Kingdom (short)[f]	258,753	89,687	46,377	20,736	22,574	736,800	35.1	9.4	2.8
European Free Trade Assoc.	32,640	10,127	2,637	2,479	5,011	143,300	22.8	5.3	1.7
Norway (short)	12,261	2,346	330	51	1,965	60,700	25.8	4.5	1.2
Norway (long)	3,401	1,131	436	695	0				
Switzerland (short)	7,098	3,178	245	701	2,232	82,600	20.6	6.0	2.1
Switzerland (long)	9,880	3,472	1,626	1,032	814				

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-18.
Ratio of first university degrees and science and engineering degrees to the 24-year-old population, in selected countries, by region: 1997 or most recent year

Region/country	All first university degrees	Total science & engineering	Degree fields			Number of 24-year-olds	Ratio of[a]		
			Natural sciences[b]	Social sciences[c]	Engineering		First univ. degrees to 24 year-old population	NS&E degrees to 24 year-old population	Social science degrees to 24 year-old population
Central & Eastern Europe ..	763,538	359,160	113,372	63,001	182,787	4,662,105	16.4	6.4	1.4
Albania (all)[g]	3,845	1,346	1,006	169	171	62,800	6.1	1.9	0.3
Bulgaria	28,171	7,151	959	1,281	4,911	122,900	22.9	4.8	1.0
Croatia	7,679	2,746	780	417	1,549	63,800	12.0	3.7	0.7
Czech Republic (short)	7,236	1,742	591	180	971	176,400	13.2	4.0	0.2
Czech Republic (long)	16,109	5,830	1,968	257	3,605				
Estonia	2,853	852	309	254	289	22,800	12.5	2.6	1.1
Georgia	18,381	9,076	4,785	1,021	3,270	73,275	25.1	11.0	1.4
Hungary (short)	21,091	4,688	998	0	3,690	152,400	20.5	5.3	1.0
Hungary (long)	10,219	4,953	1,817	1,556	1,580				
Latvia	6,797	1,777	953	224	600	36,700	18.5	4.2	0.6
Lithuania	8,760	2,696	974	338	1,384	54,400	16.1	4.3	0.6
Poland (short)	115,080	33,358	9,566	9,169	14,623	571,400	20.1	4.2	1.6
Russia	406,527	244,955	75,979	37,199	131,777	2,042,800	19.9	10.2	1.8
Slovakia	11,636	4,693	816	253	3,624	82,430	14.1	5.4	0.3
Slovenia	4,507	1,415	383	226	806	29,000	15.5	4.1	0.8
Turkey	94,647	31,882	11,488	10,457	9,937	1,171,000	8.1	1.8	0.9
The Americas									
Total, selected countries[d]	1,904,147	765,902	220,673	388,570	156,659	10,605,741	18.0	3.6	3.7
North America	1,494,863	507,529	175,062	227,110	105,357	6,105,900	24.5	4.6	3.7
Canada	124,024	54,390	18,383	27,995	8,012	374,900	33.1	7.0	7.5
Mexico	191,024	68,465	20,736	13,498	34,231	2,060,000	9.3	2.7	0.7
United States	1,179,815	384,674	135,943	185,617	63,114	3,671,000	32.1	5.4	5.1
Central/South America	394,261	196,380	45,274	110,467	40,639	4,500,963	8.8	1.9	2.5
Argentina	37,878	16,106	5,369	7,325	3,412	567,400	6.7	1.5	1.3
Brazil	245,401	147,761	32,954	97,528	17,279	3,003,400	8.2	1.7	3.2
Chile	23,010	10,531	2,358	4,516	3,657	242,963	9.5	2.5	1.9
Colombia	54,188	12,678	1,642	NA	11,036	687,200	7.9	1.8	NA
Cuba	27,502	7,339	2,117	822	4,400	201,800	13.6	3.2	0.4
Nicaragua	6,282	1,965	834	276	855	80,397	7.8	2.1	0.3
Oceania									
Total, selected countries[d] ...	116,304	29,953	18,510	4,723	6,720	327,192	35.5	7.7	1.4
Australia	97,852	25,967	15,875	4,084	6,008	272,392	35.9	8.0	1.5
New Zealand	18,452	3,986	2,635	639	712	54,800	33.7	6.1	1.2

NA = not available

NOTES: Data are compiled from numerous national and international sources, and degree fields may not be strictly comparable. First university degrees in different countries are of different duration and may not be academically equivalent. In European countries, short degree programs are three years long; long degree programs take four to six years. Data for Australia, Austria, Bulgaria, Canada, Chile, Czech Republic, Denmark, Ethiopia, Germany, Indonesia, Iran, Japan, Korea, Latvia, Lithuania, The Netherlands, New Zealand, Nicaragua, Norway, Slovakia, Slovenia, Sweden, Taiwan, and the United Kingdom are for 1997. Data for Albania, Argentina, Belgium, Brazil, China, Colombia, Croatia, Cuba, Estonia, Finland, France, Georgia, Hungary, Ireland, Israel, Italy, Jordan, Mexico, Poland, Portugal, Russia, Saudi Arabia, South Africa, Spain, Switzerland, Tunisia, Uganda and the United States are for 1996. Data for Egypt, Hong Kong, Kazakhstan, Morocco, Singapore, Syria, and Thailand are for 1995. Data for France and Turkey are for 1994. Data for Greece are for 1993. Indian and Malaysian data are for 1990.

[a]Ratios given in the last three columns are the number of degrees per 100 of the 24-year-old population. For countries with both short and long degrees, the ratios in the last 3 columns are calculated with short plus long degrees as the numerator.

[b]Natural sciences here include physical, earth, atmospheric, oceanographic, biological, and agricultural sciences, mathematics, and computer sciences.

[c]Social sciences include psychology, sociology, and other social sciences. Japanese social science data also include business administration. Mexican social science data are estimated. French social science data also include some law studies.

[d]Total includes only those countries for which relatively recent data are available.

[e]Egyptian engineering data include architecture, industrial programs, transport, and communications.

[f]U.K. data include former colleges and polytechnics.

[g]Albanian data include short university and postgraduate degrees.

Page 2 of 3

SOURCES: **ASIA: China**- National Research Center for Science and Technology for Development, unpublished tabulations, and United Nations Educational, Scientific, and Cultural Organization (UNESCO), *Statistical Yearbook* (Paris: 1998); **Hong Kong**- UNESCO (1998); **India**- Department of Science and Technology, *Research and Development Statistics 1994-95* (New Delhi: 1996); **Indonesia**- UNESCO (1999); **Japan**- Ministry of Education, Science, and Culture (Monbusho), *Monbusho Survey of Education* (Tokyo: annual series); **Malaysia**- UNESCO (1998); **Singapore**- National University of Singapore, *Annual Report* (Singapore: 1996); **South Korea**- Ministry of Education, *Statistical Yearbook of Education* (Seoul: 1996); **Taiwan**- Ministry of Education, *Educational Statistics of the Republic of China* (Taipei: 1996); **Thailand**- UNESCO (1998); **MIDDLE EAST: Egypt**- UNESCO (1998); Iran- UNESCO (1998); **Israel**- UNESCO (1998); **Jordan**- UNESCO (1998); **Kazakstan**- UNESCO (1998); **Morocco**- UNESCO (1998); **Saudi Arabia**- UNESCO (1998); **Syria**- UNESCO (1998); **Tunisia**- UNESCO (1998); **SUB-SAHARAN AFRICA: Ethiopia**- UNESCO (1999); **South Africa**- UNESCO (1999); **Uganda**- UNESCO (1999); **EUROPEAN UNION: Austria**- Austrian Central Statistical Office, unpublished tabulations; **Belgium**- Organisation for Economic Co-operation and Development and Centre for Educational Research and Innovation (OECD/CERI), unpublished tabulations, and UNESCO (1998) (social sciences); **Denmark**- Department of Higher Education, Ministry of Education, unpublished tabulations (1997); **Finland**- Central Statistical Office, unpublished tabulations (1997), and OECD/CERI; **France**- Ministère de l'Éducation Nationale, de la Recherche et de la Technologie, *Repères et Références Statistiques sur les Enseignements et la Formation* (Vanves, France: 1998); **Germany**- Statistisches Bundesamt Wiesbaden, *Prüfungen an Hochschulen* (Wiesbaden: 1998); **Greece**- National Statistical Service of Greece, unpublished tabulations (1997), and OECD/CERI; **Ireland**- OECD/CERI; **Italy**- OECD/CERI; **The Netherlands**- Department for Statistics of Education and Science, Netherlands Central Bureau of Statistics, unpublished tabulations (1997); **Portugal**- OECD/CERI; **Spain**- Estadísticas e Investigaciones Sociales, Instituto Nacional de Estadística, unpublished tabulations (1997), and OECD/CERI; **Sweden**- Statistics Sweden, unpublished tabulations (1997), and OECD/CERI; **United Kingdom**- Higher Education Statistics Agency, *Students in Higher Education Institutions: 1997/98* (Cheltenham: 1999); **EUROPEAN FREE TRADE ASSOCIATION**: **Norway**- Institute for Studies in Research and Higher Education, the Norwegian Research Council, unpublished tabulations (1997); **Switzerland**- Swiss Federal Statistical Office, unpublished tabulations (1997); **CENTRAL AND EASTERN EUROPE: Albania**- UNESCO (1998); **Bulgaria**- UNESCO (1998); **Czech Republic**- UNESCO (1998); **Estonia**- UNESCO (1998); **Georgia**- UNESCO (1998); **Hungary**- OECD/CERI; **Latvia**- UNESCO (1998); **Lithuania**- UNESCO (1998); **Poland**- UNESCO (1998); **Russia**- UNESCO (1998); **Slovakia**- UNESCO (1998); **Slovenia**- UNESCO (1998); **Turkey**- UNESCO (1998); **NORTH AMERICA**: **Canada**- Association of Universities and Colleges, unpublished tabulations, 1998; **Mexico**- Asociación Nacional de Universidades y Instituciones de Educación Superior, *Anuario Estadístico 1997: Posgrado* (Mexico, 1997); **United States**- National Science Foundation, Science Resources Studies Division, *Science and Engineering Degrees 1966-96* (Arlington, VA: 1998); **CENTRAL/SOUTH AMERICA**: **Argentina**- unpublished tabulations; **Brazil**- Ministério de Educação e Cultura, Coordenação de Aperfeiçoamento de Pessoal de Nivel Superior (CAPES); **Chile**- UNESCO (1999); **Colombia**- UNESCO (1998); **Cuba**- UNESCO (1998); **Nicaragua**- UNESCO (1999); **OCEANIA: Australia**- UNESCO (1999); and **New Zealand**- UNESCO (1998).

See figure 4-15 in Volume 1.

Appendix table 4-19.
Science and engineering degrees earned within Asian universities in selected Asian countries, by level: 1975–97

Year	Natural sciences[a]	Math and computer sciences	Agricultural sciences	Social sciences[b]	Engineering
Bachelor's degrees					
1975	107,207	3,690	16,792	137,245	92,976
1976	110,111	4,263	18,166	143,443	95,838
1977	112,929	4,506	19,531	147,682	99,947
1978	116,659	4,496	21,149	155,854	104,421
1979	113,320	4,857	23,128	162,506	109,356
1980	115,826	5,168	22,051	162,909	111,080
1981	117,898	5,595	23,363	165,103	116,043
1982	120,225	5,974	23,805	164,286	117,198
1983	122,588	6,447	23,902	159,327	120,324
1984	125,973	6,808	24,520	158,147	123,755
1985	148,034	16,100	36,140	174,750	198,734
1986	150,382	16,956	38,251	178,441	214,434
1987	158,174	17,777	40,458	182,845	227,315
1988	157,993	22,846	42,272	186,578	241,800
1989	163,096	25,369	42,244	186,159	255,297
1990	167,663	26,456	43,965	199,707	257,325
1991	168,378	28,239	42,718	225,221	272,295
1992	169,571	29,686	42,413	236,131	280,975
1993	175,343	29,097	47,459	233,751	283,075
1994	189,065	30,290	48,006	239,071	308,867
1995	191,489	34,587	49,407	256,573	324,468
1996	188,301	36,040	46,640	261,568	317,682
1997	NA	NA	NA	NA	NA
Doctoral degrees					
1975	2,191	0	722	122	1,150
1976	2,399	0	859	123	1,281
1977	2,706	0	910	124	1,283
1978	2,863	0	912	113	1,323
1979	3,120	1	962	106	1,408
1980	3,268	1	1,063	108	1,431
1981	3,390	1	1,154	111	1,593
1982	3,523	3	1,150	131	1,737
1983	3,665	4	1,167	153	1,912
1984	3,899	2	1,404	152	1,952
1985	4,017	27	1,372	193	2,237
1986	3,992	23	1,355	215	2,492
1987	4,138	45	1,444	273	2,645
1988	4,326	162	1,560	305	3,231
1989	4,295	201	1,580	338	3,621
1990	4,237	188	1,509	369	3,893
1991	4,352	226	1,653	458	4,100
1992	4,524	249	1,816	501	4,184
1993	4,875	272	1,838	603	4,700
1994	5,411	333	1,990	694	5,432
1995	6,006	411	2,085	750	6,109
1996	6,642	505	2,218	888	7,341
1997	7,016	609	2,285	999	7,878

NA = not available

NOTES: Asian countries include China, India, Japan, South Korea, and Taiwan. Chinese degree data included for 1985-96. Mathematics and computer science degree data in China are estimated for 1995-96.

[a]Natural sciences include physical, biological, earth, atmospheric, and oceanographic sciences.

[b]Social sciences include psychology, sociology, and other social sciences.

SOURCE: National Science Foundation, Science Resources Studies Division, Database on Global Human Resources for Science, unpublished tabulations.

See figures 4-13 and 4-14 in Volume 1.

Appendix table 4-20.
Percentage of total bachelor's degrees in science and engineering in selected countries/regions: 1997 or most recent year

Region/country	All first university degrees	Total science & engineering	Degree fields		
			Natural sciences[a]	Social sciences[b]	Engineering
Total, world regions	100.0	41.7	13.6	14.3	13.8
Asia					
Total	100.0	47.4	14.1	16.1	17.2
China	100.0	72.3	16.7	9.9	45.7
Hong Kong	100.0	47.7	20.9	10.9	16.0
India	100.0	23.5	19.6	NA	3.9
Indonesia	100.0	67.3	7.4	45.6	14.3
Japan	100.0	66.5	6.2	40.7	19.6
Malaysia	100.0	45.3	16.0	20.9	8.3
Singapore	100.0	100.0	37.6	32.5	29.9
South Korea	100.0	46.4	17.0	8.5	21.0
Taiwan	100.0	39.2	14.8	6.9	17.5
Thailand	100.0	26.1	8.6	8.4	9.1
Middle East					
Total	100.0	27.9	13.2	5.5	9.2
Egypt	100.0	15.9	7.8	1.7	6.3
Iran	100.0	37.1	12.9	8.8	15.4
Israel	100.0	51.3	13.6	25.4	12.4
Jordan	100.0	28.0	13.9	7.8	6.3
Kazakstan	100.0	29.1	14.9	2.1	12.1
Morocco	100.0	41.3	28.6	11.5	1.2
Saudi Arabia	100.0	22.1	15.8	3.1	3.2
Syria	100.0	27.3	8.4	NA	18.9
Tunisia	100.0	31.0	16.6	7.4	7.0
Sub-Saharan Africa					
Total	100.0	33.9	10.3	18.8	4.8
Ethiopia	100.0	39.6	20.0	9.8	9.8
Uganda	100.0	33.1	8.9	19.7	4.5
South Africa	100.0	38.8	19.3	16.3	3.2
Europe					
Total	100.0	42.9	14.9	10.5	17.5
European Union	100.0	40.3	15.1	12.1	13.0
Austria (long)	100.0	35.9	15.7	8.4	11.8
Belgium (long)	100.0	27.1	7.6	NA	19.5
Denmark (short)	100.0	17.0	2.4	5.4	9.2
Denmark (long)	100.0	63.8	31.2	14.1	18.5
Finland (short)	100.0	46.9	9.5	2.9	34.6
Finland (long)	100.0	39.4	15.0	9.9	14.5
France (long)	100.0	71.5	22.0	28.5	21.0
Germany (short)	100.0	57.9	8.3	16.8	32.8
Germany (long)	100.0	49.6	18.3	20.4	11.0
Greece (long)	100.0	24.7	13.8	1.2	9.6
Ireland (short)	100.0	20.7	10.9	5.6	4.2
Ireland (long)	100.0	56.1	34.3	4.9	16.8
Italy (short)	100.0	26.8	8.2	10.3	8.4
Italy (long)	100.0	32.9	14.5	8.7	9.7
The Netherlands (long)	100.0	39.6	8.6	18.3	12.7
Portugal (short)	100.0	16.4	2.7	1.2	12.5
Portugal (long)	100.0	33.3	8.1	15.7	9.6
Spain (short)	100.0	25.5	10.3	0.0	15.2
Spain (long)	100.0	27.9	15.3	7.4	5.2
Sweden (short)	100.0	19.1	4.7	8.9	5.4
Sweden (long)	100.0	44.7	14.2	4.1	26.4
United Kingdom (short)[c]	100.0	34.7	17.9	8.0	8.7
European Free Trade Assoc	100.0	31.0	8.1	7.6	15.4
Norway (short)	100.0	19.1	2.7	0.4	16.0
Norway (long)	100.0	33.3	12.8	20.4	0.0
Switzerland (short)	100.0	44.8	3.5	9.9	31.4
Switzerland (long)	100.0	35.1	16.5	10.4	8.2

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-20.
Percentage of bachelor's degrees in science and engineering in selected countries/regions: 1997 or most recent year

Region/country	All first university degrees	Total science & engineering	Degree fields		
			Natural sciences[a]	Social sciences[b]	Engineering
Central & Eastern Europe	100.0	47.0	14.8	8.3	23.9
Albania	100.0	35.0	26.2	4.4	4.4
Bulgaria	100.0	25.4	3.4	4.5	17.4
Croatia	100.0	35.8	10.2	5.4	20.2
Czech Republic (short)	100.0	24.1	8.2	2.5	13.4
Czech Republic (long)	100.0	36.2	12.2	1.6	22.4
Estonia	100.0	29.9	10.8	8.9	10.1
Georgia	100.0	49.4	26.0	5.6	17.8
Hungary (short)	100.0	22.2	4.7	0.0	17.5
Hungary (long)	100.0	48.5	17.8	15.2	15.5
Latvia	100.0	26.1	14.0	3.3	8.8
Lithuania	100.0	30.8	11.1	3.9	15.8
Poland (short)	100.0	29.0	8.3	8.0	12.7
Russia	100.0	60.3	18.7	9.2	32.4
Slovakia	100.0	40.3	7.0	2.2	31.1
Slovenia	100.0	31.4	8.5	5.0	17.9
Turkey	100.0	33.7	12.1	11.0	10.5
North America					
Total	100.0	34.0	11.7	15.2	7.0
Canada	100.0	43.9	14.8	22.6	6.5
Mexico	100.0	35.8	10.9	7.1	17.9
United States	100.0	32.6	11.5	15.7	5.3
South America					
Total	100.0	49.8	11.5	28.0	10.3
Argentina	100.0	42.5	14.2	19.3	9.0
Brazil	100.0	60.2	13.4	39.7	7.0
Chile	100.0	45.8	10.2	19.6	15.9
Colombia	100.0	23.4	3.0	NA	20.4
Cuba	100.0	26.7	7.7	3.0	16.0
Nicaragua	100.0	31.3	13.3	4.4	13.6
Oceania					
Total	100.0	25.8	15.9	4.1	5.8
Australia	100.0	26.5	16.2	4.2	6.1
New Zealand	100.0	21.6	14.3	3.5	3.9

NA = not available

[a]Natural sciences here include physical, earth, atmospheric, oceanographic, biological, and agricultural sciences, mathematics, and computer sciences.

[b]Social sciences include psychology, sociology, and other social sciences. Japanese social science data also include business administration. Mexican social science data are estimated. French social science data also include some law studies.

[c]U.K. data include former colleges and polytechnics.

SOURCE: Computed from degree data of appendix table 4-18.

See page 4-18 in Volume 1.

Appendix table 4-21.
Graduate enrollment in science and engineering, by field and sex: 1975–97

Field	1975	1977	1979	1981	1983	1985	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Total																	
Science & engineering	303,190	311,816	319,171	332,086	347,065	358,126	373,341	375,277	382,747	397,135	412,697	430,644	435,886	431,251	422,555	415,363	407,644
Natural sciences[a]	95,489	101,221	100,871	100,617	102,979	104,074	104,963	105,529	107,301	109,364	112,474	116,699	119,489	120,833	120,325	117,677	114,697
Math & computer sciences	25,307	25,160	26,721	32,318	40,691	47,332	50,559	51,304	51,729	54,031	54,562	56,648	56,189	53,707	51,941	52,607	52,769
Social sciences[b]	114,123	116,750	119,851	119,596	112,276	110,729	113,866	115,615	119,674	126,115	132,085	139,262	143,350	143,688	143,090	141,856	139,170
Engineering	68,271	68,685	71,728	79,555	91,119	95,991	103,953	102,829	104,043	107,625	113,576	118,035	116,858	113,023	107,199	103,223	101,008
Male																	
Science & engineering	NA	233,862	229,860	232,209	240,525	247,464	256,149	254,005	256,849	263,394	271,845	280,397	279,289	272,120	262,341	253,629	245,615
Natural sciences[a]	0	76,073	72,945	70,721	70,711	70,745	70,685	69,869	70,263	70,800	71,753	73,754	74,086	73,878	72,488	69,951	67,234
Math & computer sciences	0	19,482	20,376	23,628	28,877	34,417	36,948	37,334	37,756	39,633	39,994	41,644	41,129	39,087	37,554	37,596	37,008
Social sciences[b]	0	73,322	70,687	66,051	59,625	57,391	57,526	57,097	58,387	60,008	62,237	64,197	64,908	64,181	63,114	61,111	59,080
Engineering	NA	64,985	65,852	71,809	81,312	84,911	90,990	89,705	90,443	92,953	97,861	100,802	99,166	94,974	89,185	84,971	82,293
Female																	
Science & engineering	NA	77,954	89,311	99,877	106,540	110,662	117,192	121,272	125,898	133,741	140,852	150,247	156,597	159,131	160,214	161,734	162,029
Natural sciences[a]	0	25,148	27,926	29,896	32,268	33,329	34,278	35,660	37,038	38,564	40,721	42,945	45,403	46,955	47,837	47,726	47,463
Math & computer sciences	0	5,678	6,345	8,690	11,814	12,915	13,611	13,970	13,973	14,398	14,568	15,004	15,060	14,620	14,387	15,011	15,761
Social sciences[b]	0	43,428	49,164	53,545	52,651	53,338	56,340	58,518	61,287	66,107	69,848	75,065	78,442	79,507	79,976	80,745	80,090
Engineering	NA	3,700	5,876	7,746	9,807	11,080	12,963	13,124	13,600	14,672	15,715	17,233	17,692	18,049	18,014	18,252	18,715

NA = not available

NOTE: For detailed statistical tables on graduate enrollment, see source document on Science Resources Studies Division Web page <<http://www.nsf.gov/sbe/srs/stats.htm>>.

[a]Natural sciences here include physical, earth, atmospheric, oceanographic, biological, and agricultural sciences.

[b]Social sciences include psychology, sociology, and other social sciences.

SOURCES: National Science Foundation, Science Resources Studies Division, *Graduate Students and Postdoctorates in Science and Engineering, Fall 1997*, NSF 99-325, Project Officer, Joan Burrelli (Arlington, VA: 1999); and previous years of this publication.

See page 4-20 in Volume 1.

Appendix table 4-22.
Graduate enrollment in science and engineering, by field, race/ethnicity, and citizenship: 1983–97

Field and race/ethnicity	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Total															
Science & engineering	347,014	349,875	358,201	368,212	373,425	375,287	382,769	397,135	412,697	430,644	435,886	431,251	422,555	415,363	407,644
Natural sciences[a]	102,968	103,547	103,990	105,541	104,974	105,529	107,301	109,364	112,474	116,699	119,489	120,833	120,325	117,677	114,697
Math & computer sciences	40,713	42,985	47,341	49,316	50,575	51,304	51,729	54,031	54,562	56,648	56,189	53,707	51,941	52,607	52,769
Social sciences[b]	112,236	110,647	110,808	111,499	113,939	115,625	119,696	126,115	132,085	139,262	143,350	143,688	143,090	141,856	139,170
Engineering	91,097	92,696	95,982	101,856	103,937	102,829	104,043	107,625	113,576	118,035	116,858	113,023	107,199	103,223	101,008
U.S. citizen															
Total S&E	276,784	277,682	281,388	284,231	284,631	281,672	284,686	294,318	304,063	321,182	330,169	329,095	324,017	317,209	308,835
Natural sciences[a]	84,700	84,712	83,663	82,854	80,562	79,431	79,242	79,521	81,148	84,893	88,164	89,890	90,648	89,276	87,376
Math & computer sciences	30,306	31,532	34,499	35,448	35,669	35,895	35,352	36,561	36,306	38,041	38,135	36,580	35,338	34,991	34,413
Social sciences[b]	98,173	96,644	95,978	96,018	97,831	98,743	102,746	108,810	114,376	121,653	126,279	126,586	126,299	124,748	122,460
Engineering	63,605	64,794	67,160	69,911	70,569	67,603	67,346	69,426	72,233	76,595	77,591	76,039	71,732	68,194	64,586
White, S&E	224,705	224,705	224,705	224,705	224,705	229,037	229,694	238,472	243,602	253,435	256,859	255,719	245,889	238,077	227,936
Natural sciences[a]	74,337	74,046	71,971	71,713	69,100	68,737	68,110	68,736	69,472	71,328	72,552	74,134	73,296	71,777	69,021
Math & computer sciences	23,823	24,040	25,511	26,053	26,806	27,479	26,560	27,897	26,921	27,744	27,332	26,205	24,398	23,644	22,432
Social sciences[b]	77,963	75,787	76,129	76,930	79,157	80,492	83,531	88,632	92,425	96,967	99,535	99,360	96,239	93,544	90,466
Engineering	48,582	48,582	48,582	48,582	48,582	52,329	51,493	53,207	54,784	57,396	57,440	56,020	51,956	49,112	46,017
Asian/Pacific Islander, S&E	9,353	10,172	12,000	12,775	14,572	15,188	15,693	17,155	18,136	21,752	24,059	26,474	25,901	25,947	26,078
Natural sciences[a]	2,378	2,526	2,712	2,761	3,043	3,478	3,604	3,928	4,267	5,035	6,162	6,606	6,778	6,899	6,835
Math & computer sciences	1,666	1,816	2,491	2,770	3,235	3,438	3,430	3,710	3,724	4,362	4,586	5,264	5,174	5,494	5,754
Social sciences[b]	1,903	2,018	1,992	2,130	2,436	2,362	2,648	2,830	3,029	3,863	4,324	4,827	4,941	5,117	5,335
Engineering	3,406	3,812	4,805	5,114	5,858	5,910	6,011	6,687	7,116	8,492	8,987	9,777	9,008	8,437	8,154
Black, S&E	10,903	10,711	10,462	10,470	10,429	11,191	11,775	12,774	13,691	15,445	17,118	17,611	18,283	19,071	19,363
Natural sciences[a]	1,980	2,000	1,982	1,845	1,817	1,972	2,093	2,184	2,302	2,711	3,042	3,007	3,289	3,487	3,558
Math & computer sciences	971	960	1,031	1,151	1,210	1,261	1,311	1,496	1,617	1,687	1,878	1,855	1,844	1,989	1,960
Social sciences[b]	6,574	6,306	6,062	6,022	5,986	6,458	6,755	7,308	7,747	8,673	9,639	9,965	10,294	10,700	10,971
Engineering	1,378	1,445	1,387	1,452	1,416	1,500	1,616	1,786	2,025	2,374	2,559	2,784	2,856	2,895	2,874
Hispanic, S&E	8,811	8,681	8,613	8,660	8,823	9,098	9,436	10,159	11,045	12,246	13,381	13,281	14,117	14,638	14,988
Natural sciences[a]	1,919	1,892	2,092	2,118	2,071	2,228	2,386	2,375	2,552	2,726	3,075	2,933	3,209	3,338	3,574
Math & computer sciences	615	585	750	723	817	844	847	916	980	1,082	1,111	1,002	1,064	1,126	1,152
Social sciences[b]	4,836	4,713	4,290	4,217	4,205	4,307	4,496	4,982	5,389	5,975	6,501	6,485	7,036	7,239	7,451
Engineering	1,441	1,491	1,481	1,602	1,730	1,719	1,707	1,886	2,124	2,463	2,694	2,861	2,808	2,935	2,811
American Indian/ Alaskan Native, S&E	911	830	736	743	783	918	860	1,054	1,120	1,243	1,309	1,383	1,516	1,539	1,599
Natural sciences[a]	224	206	167	196	183	216	180	255	251	282	318	336	393	374	412
Math & computer sciences	53	71	79	52	76	71	74	64	62	99	100	79	125	94	103
Social sciences[b]	454	361	368	365	401	488	484	583	622	685	680	726	767	837	846
Engineering	180	192	122	130	123	143	122	152	185	177	211	242	231	234	238
Unknown, S&E	22,101	24,179	25,825	23,961	21,160	16,240	17,228	14,704	16,469	17,061	17,443	14,627	18,311	17,937	18,871
Natural sciences[a]	3,862	4,042	4,819	4,221	4,348	2,800	2,869	2,043	2,304	2,811	3,015	2,874	3,683	3,401	3,976
Math & computer sciences	3,178	4,060	4,637	4,699	3,525	2,802	3,130	2,478	3,002	3,067	3,128	2,175	2,733	2,644	3,012
Social sciences[b]	6,443	7,459	7,145	6,354	5,646	4,636	4,832	4,475	5,164	5,490	5,600	5,223	7,022	7,311	7,391
Engineering	8,618	8,618	9,224	8,687	7,641	6,002	6,397	5,708	5,999	5,693	5,700	4,355	4,873	4,581	4,492

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-22.
Graduate enrollment in science and engineering, by field, race/ethnicity, and citizenship: 1983–97

Field and race/ethnicity	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
								Foreign citizen							
Total S&E	70,230	72,193	76,813	83,981	88,794	93,615	98,083	102,817	108,634	109,462	105,717	102,156	98,538	98,154	98,809
Natural sciences[a]	18,268	18,835	20,327	22,687	24,412	26,098	28,059	29,843	31,326	31,806	31,325	30,943	29,677	28,401	27,321
Math & computer sciences	10,407	11,453	12,842	13,868	14,906	15,409	16,377	17,470	18,256	18,607	18,054	17,127	16,603	17,616	18,356
Social sciences[b]	14,063	14,003	14,830	15,481	16,108	16,882	16,950	17,305	17,709	17,609	17,071	17,102	16,791	17,108	16,710
Engineering	27,492	27,902	28,822	31,945	33,368	35,226	36,697	38,199	41,343	41,440	39,267	36,984	35,467	35,029	36,422

[a]Natural sciences here include physical, earth, atmospheric, oceanographic, biological, and agricultural sciences.

[b]Social sciences include psychology, sociology, and other social sciences.

SOURCES: National Science Foundation, Science Resources Studies Division, *Graduate Students and Postdoctorates in Science and Engineering Fall 1997*, NSF 99-325, Project Officer, Joan Burrelli (Arlington, VA: 1999); and previous years of this publication.

See page 4-20 in Volume 1.

Appendix table 4-23.
Earned master's degrees, by field and sex: 1954–96 (selected years)

Field	1954	1966	1971	1976	1981	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Total																
All degrees	56,832	140,772	231,486	313,001	296,798	289,829	290,532	300,091	311,050	324,947	338,498	354,207	370,973	389,008	399,428	408,932
Science and engineering	13,523	41,049	56,454	65,007	64,366	71,831	72,603	73,655	76,425	77,788	78,368	81,107	86,425	91,411	94,309	95,313
Natural sciences	5,286	10,830	13,946	14,684	14,349	13,910	13,400	13,184	13,218	12,928	12,682	13,232	13,474	14,367	14,793	16,158
Physical	1,924	4,206	5,115	3,880	3,366	3,649	3,574	3,708	3,876	3,805	3,777	3,922	3,965	4,263	4,241	4,364
Earth/atm/ocean	450	759	1,227	1,581	1,876	2,234	2,051	1,920	1,819	1,596	1,499	1,425	1,397	1,418	1,483	1,487
Biological & agricultural	2,912	5,865	7,604	9,223	9,107	8,027	7,775	7,556	7,523	7,527	7,406	7,885	8,112	8,686	9,069	10,307
Math/computer sciences	706	5,010	6,789	6,466	6,787	11,241	11,808	12,600	12,829	13,327	12,956	13,320	14,100	14,350	14,495	14,355
Mathematics	706	4,772	5,201	3,863	2,569	3,171	3,327	3,434	3,430	3,684	3,632	3,665	3,751	3,804	3,932	3,742
Computer sciences	0	238	1,588	2,603	4,218	8,070	8,481	9,166	9,399	9,643	9,324	9,655	10,349	10,546	10,563	10,613
Social & behavioral sciences	3,327	11,504	19,352	26,563	26,779	25,584	25,325	25,145	26,635	27,538	28,717	29,537	31,187	33,977	36,391	37,039
Psychology	1,254	2,423	4,438	7,859	8,039	8,363	8,165	7,925	8,652	9,308	9,802	9,852	10,412	11,572	13,132	13,043
Social sciences	2,073	9,081	14,914	19,953	18,740	17,221	17,160	17,220	17,983	18,230	18,915	19,685	20,775	22,405	23,259	23,996
Engineering	4,204	13,705	16,367	16,045	16,451	21,096	22,070	22,726	23,743	23,995	24,013	25,018	27,664	28,717	28,630	27,761
Chemical engineering	448	1,072	1,200	1,129	1,406	1,641	1,386	1,322	1,321	1,205	1,025	1,145	1,220	1,287	1,369	1,416
Civil engineering	562	2,218	2,700	3,605	3,428	3,281	3,267	3,134	3,296	3,213	3,404	3,755	4,438	4,918	5,168	5,002
Electrical engineering	977	3,872	4,282	3,774	3,902	6,147	6,895	7,455	7,849	8,009	7,942	8,274	8,828	8,870	8,743	8,156
Industrial engineering	375	1,200	1,921	1,751	1,631	1,653	1,728	1,816	1,823	1,834	2,039	2,370	2,745	2,882	2,873	3,027
Mechanical engineering	723	2,154	2,505	2,088	2,419	3,256	3,380	3,513	3,703	3,630	3,680	3,826	4,169	4,277	4,368	4,009
Other engineering	1,119	3,189	3,759	3,698	3,665	5,118	5,414	5,486	5,751	6,104	5,923	5,648	6,264	6,483	6,109	6,151
Engineering technology	NA	NA	NA	NA	532	925	883	980	1,135	1,194	1,188	1,278	1,555	1,547	1,577	1,651
Male																
All degrees	38,140	93,184	138,590	167,745	147,431	143,932	141,655	145,403	149,399	154,025	156,895	162,299	169,753	176,762	179,198	180,360
Science and engineering	11,779	35,580	46,116	49,992	45,505	48,611	48,759	49,820	50,845	51,230	50,441	52,157	55,454	57,970	58,518	57,860
Natural sciences	4,396	9,083	11,036	11,388	10,222	9,133	8,652	8,562	8,383	8,052	7,794	8,118	8,181	8,539	8,730	9,224
Physical	1,762	3,723	4,379	3,275	2,691	2,736	2,684	2,817	2,836	2,754	2,703	2,834	2,794	3,030	2,958	2,914
Earth/atm/ocean	68	714	1,111	1,361	1,470	1,717	1,531	1,433	1,337	1,218	1,116	1,057	1,006	994	1,032	1,051
Biological & agricultural	2,566	4,646	5,546	6,752	6,061	4,680	4,437	4,312	4,210	4,080	3,975	4,227	4,381	4,515	4,740	5,259
Math/computer sciences	579	3,992	5,101	4,776	4,939	7,713	8,011	8,759	8,833	9,176	8,709	9,199	9,773	10,128	10,130	9,999
Mathematics	579	3,771	3,677	2,550	1,692	2,055	2,026	2,057	2,060	2,208	2,146	2,219	2,219	2,311	2,353	2,236
Computer sciences	0	221	1,424	2,226	3,247	5,658	5,985	6,702	6,773	6,968	6,563	6,980	7,554	7,817	7,777	7,763
Social & behavioral sciences	2,615	8,876	13,798	18,351	15,222	13,069	12,796	12,581	12,968	13,276	13,282	13,491	13,930	15,009	15,660	15,628
Psychology	885	1,625	2,787	4,188	3,371	2,937	2,838	2,599	2,814	3,025	2,994	2,929	2,928	3,287	3,735	3,670
Social sciences	1,730	7,251	11,011	14,163	11,851	10,132	9,958	9,982	10,154	10,251	10,288	10,562	11,002	11,722	11,925	11,958
Engineering	4,189	13,629	16,181	15,477	15,122	18,696	19,300	19,918	20,661	20,726	20,656	21,349	23,570	24,294	23,998	23,009
Chemical engineering	446	1,065	1,173	1,088	1,230	1,401	1,143	1,107	1,092	1,013	852	914	996	1,008	1,063	1,110
Civil engineering	562	2,209	2,656	3,454	3,112	2,908	2,792	2,721	2,851	2,693	2,864	3,120	3,607	3,965	4,123	3,938
Electrical engineering	977	3,850	4,252	3,670	3,681	5,508	6,178	6,642	6,933	7,018	7,008	7,229	7,777	7,721	7,539	6,960
Industrial engineering	373	1,194	1,898	1,670	1,465	1,374	1,409	1,492	1,465	1,493	1,603	1,898	2,190	2,346	2,361	2,403
Mechanical engineering	723	2,147	2,495	2,056	2,292	3,002	3,133	3,218	3,377	3,276	3,320	3,455	3,769	3,860	3,918	3,555
Other engineering	1,108	3,164	3,707	3,539	3,342	4,503	4,645	4,738	4,943	5,233	5,009	4,733	5,231	5,394	4,994	5,043
Engineering technology	NA	NA	NA	NA	380	710	678	738	892	888	888	971	1,172	1,164	1,136	1,179

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-23.
Earned master's degrees, by field and sex: 1954–96 (selected years)

Field	1954	1966	1971	1976	1981	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
								Female								
All degrees	18,692	47,588	92,896	145,256	149,367	145,897	148,877	154,688	161,651	170,922	181,603	191,908	201,220	212,246	220,230	228,572
Science and engineering	1,744	5,469	10,338	15,015	18,861	23,220	23,844	23,835	25,580	26,558	27,927	28,950	30,971	33,441	35,791	37,453
Natural sciences	890	1,747	2,910	3,296	4,127	4,777	4,748	4,622	4,835	4,876	4,888	5,114	5,293	5,828	6,063	6,934
Physical	162	483	736	605	675	913	890	891	1,040	1,051	1,074	1,088	1,171	1,233	1,283	1,450
Earth/atm/ocean	382	45	116	220	406	517	520	487	482	378	383	368	391	424	451	436
Biological & agricultural	346	1,219	2,058	2,471	3,046	3,347	3,338	3,244	3,313	3,447	3,431	3,658	3,731	4,171	4,329	5,048
Math/computer sciences	127	1,018	1,688	1,690	1,848	3,528	3,797	3,841	3,996	4,151	4,247	4,121	4,327	4,222	4,365	4,356
Mathematics	127	1,001	1,524	1,313	877	1,116	1,301	1,377	1,370	1,476	1,486	1,446	1,532	1,493	1,579	1,506
Computer sciences	0	17	164	377	971	2,412	2,496	2,464	2,626	2,675	2,761	2,675	2,795	2,729	2,786	2,850
Social & behavioral sciences	712	2,628	5,554	9,461	11,557	12,515	12,529	12,564	13,667	14,262	15,435	16,046	17,257	18,968	20,731	21,411
Psychology	369	798	1,651	3,671	4,668	5,426	5,327	5,326	5,838	6,283	6,808	6,923	7,484	8,285	9,397	9,373
Social sciences	343	1,830	3,903	5,790	6,889	7,089	7,202	7,238	7,829	7,979	8,627	9,123	9,773	10,683	11,334	12,038
Engineering	15	76	186	568	1,329	2,400	2,770	2,808	3,082	3,269	3,357	3,669	4,094	4,423	4,632	4,752
Chemical engineering	2	7	27	41	176	240	243	215	229	192	173	231	224	279	306	306
Civil engineering	0	9	44	151	316	373	475	413	445	520	540	635	831	953	1,045	1,064
Electrical engineering	0	22	30	104	221	639	717	813	916	991	934	1,045	1,051	1,149	1,204	1,196
Industrial engineering	2	6	23	81	166	279	319	324	358	341	436	472	555	536	512	624
Mechanical engineering	0	7	10	32	127	254	247	295	326	354	360	371	400	417	450	454
Other engineering	11	25	52	159	323	615	769	748	808	871	914	915	1,033	1,089	1,115	1,108
Engineering technology	NA	NA	NA	NA	152	215	205	242	243	306	300	307	383	383	441	472

NA = not available

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Science and Engineering Degrees: 1966- 96*, NSF 97-335 (Arlington, VA: 1999); SRS Web page <<http://www.nsf.gov/sbc/srs>> for 1996 data Early Release Tables; and U.S. Department of Health, Education, and Welfare, *Statistics of Higher Education: Faculty, Students, and Degrees 1953- 54* (Washington, DC: U.S. Government Printing Office, 1956).

See figures 4-16 and 4-30 in Volume 1.

Appendix table 4-24.
Earned doctoral degrees in science and engineering, by field: 1950–65 (selected years)

Field	1950	1955	1960	1965
All degrees	6,535	8,905	9,998	17,110
Science and engineering	4,344	5,847	6,500	11,108
Natural sciences	2,975	3,719	4,131	6,282
Physical sciences	1,474	1,524	1,681	2,545
Earth sciences	130	180	251	395
Life & agricultural sciences[a]	1,371	2,015	2,199	3,342
Mathematical sciences	176	243	289	734
Social & behavioral sciences	978	1,604	1,684	2,473
Psychology	360	734	752	1,072
Social sciences	618	870	932	1,401
Engineering	469	649	825	2,186

[a]Life science is different from biological science as reported by the National Science Foundation in subsequent years.

SOURCE: National Research Council, *A Century of Doctorates: Data Analyses of Growth and Change*, Project Director, Lindsey Harmon (Washington, DC: National Academy of Sciences, 1978).

See appendix table 4-25, figure 4-17, and page 4-20 in Volume 1.

Appendix table 4-25.
Earned doctoral degrees, by field and sex: 1970–97 (selected years)

Field	1970	1975	1980	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Total																
All degrees	29,498	32,952	31,020	31,297	31,902	32,370	33,500	34,327	36,067	37,534	38,890	39,801	41,034	41,743	42,415	42,705
Science and engineering	18,052	18,799	17,775	18,935	19,437	19,894	20,932	21,732	22,868	24,023	24,675	25,443	26,205	26,535	27,230	26,847
Natural sciences	8,556	8,103	7,864	8,436	8,483	8,655	9,172	9,185	9,763	10,159	10,435	10,529	11,079	11,024	11,392	11,256
Physical	3,893	3,076	2,521	2,934	3,120	3,238	3,350	3,261	3,524	3,626	3,781	3,699	3,977	3,841	3,838	3,711
Earth/atm/ocean	498	625	628	599	559	602	695	723	738	815	794	771	824	780	794	862
Biological & agricultural	4,165	4,402	4,715	4,903	4,804	4,815	5,126	5,202	5,502	5,723	5,862	6,060	6,281	6,412	6,760	6,683
Math/computer sciences	1,332	1,360	962	998	1,128	1,190	1,264	1,471	1,597	1,839	1,927	2,026	2,021	2,187	2,043	2,001
Mathematics	1,225	1,147	744	688	729	740	749	859	892	1,039	1,058	1,146	1,118	1,190	1,122	1,112
Computer sciences	107	213	218	310	399	450	515	612	705	800	869	880	903	997	921	889
Social & behavioral sciences	4,825	6,538	6,470	6,335	6,450	6,337	6,310	6,532	6,613	6,806	6,873	7,189	7,280	7,307	7,490	7,538
Psychology	1,890	2,751	3,098	3,118	3,126	3,173	3,074	3,208	3,281	3,250	3,263	3,420	3,379	3,429	3,491	3,489
Social sciences	2,935	3,787	3,372	3,217	3,324	3,164	3,236	3,324	3,332	3,556	3,610	3,769	3,901	3,878	3,999	4,049
Engineering	3,446	3,011	2,479	3,166	3,376	3,712	4,187	4,543	4,894	5,214	5,438	5,698	5,822	6,008	6,305	6,052
Chemical engineering	457	396	316	504	531	584	685	712	658	691	725	737	725	708	798	764
Civil engineering	366	361	306	391	429	477	531	538	553	575	594	624	684	656	697	653
Electrical engineering	857	714	540	716	806	779	1,010	1,137	1,276	1,405	1,483	1,543	1,673	1,731	1,740	1,695
Mechanical engineering	635	487	384	513	536	657	715	760	884	875	987	1,030	1,015	1,025	1,052	1,010
Materials engineering	303	272	273	303	305	392	374	380	440	489	485	535	539	588	572	573
Other engineering	828	781	660	739	769	823	872	1,016	1,083	1,179	1,164	1,229	1,186	1,300	1,446	1,357
Male																
All degrees	25,527	25,751	21,612	20,553	20,595	20,938	21,681	21,814	22,961	23,661	24,454	24,679	25,215	25,329	25,470	25,383
Science and engineering	16,404	15,870	13,814	14,044	14,270	14,582	15,270	15,623	16,498	17,091	17,595	17,791	18,285	18,247	18,584	18,051
Natural sciences	7,776	6,960	6,328	6,452	6,426	6,484	6,779	6,649	7,100	7,319	7,413	7,311	7,711	7,530	7,681	7,501
Physical	3,666	2,812	2,199	2,467	2,610	2,710	2,783	2,642	2,863	2,947	3,011	2,919	3,149	2,963	2,996	2,878
Earth/atm/ocean	483	595	564	491	464	490	560	575	597	636	606	611	641	610	622	658
Biological & agricultural	3,627	3,553	3,565	3,494	3,352	3,284	3,435	3,433	3,641	3,741	3,798	3,782	3,924	3,966	4,063	3,965
Math/computer sciences	1,253	1,237	846	859	959	1,000	1,087	1,208	1,329	1,523	1,602	1,624	1,648	1,736	1,673	1,597
Mathematics	1,148	1,038	649	582	608	615	628	704	734	840	853	882	882	925	891	852
Computer sciences	105	199	197	277	351	385	459	504	595	683	749	742	766	811	782	745
Social & behavioral sciences	4,050	4,913	4,251	3,765	3,734	3,628	3,504	3,597	3,589	3,497	3,646	3,679	3,735	3,660	3,701	3,648
Psychology	1,446	1,878	1,787	1,577	1,527	1,475	1,393	1,408	1,368	1,254	1,335	1,332	1,277	1,249	1,163	1,165
Social sciences	2,604	3,035	2,464	2,188	2,207	2,153	2,111	2,189	2,221	2,243	2,311	2,347	2,458	2,411	2,538	2,483
Engineering	3,430	2,959	2,389	2,968	3,151	3,470	3,901	4,168	4,479	4,747	4,932	5,176	5,187	5,312	5,529	5,305
Chemical engineering	454	391	302	463	470	524	620	632	580	608	612	643	612	599	655	641
Civil engineering	365	356	295	371	408	459	501	484	504	534	544	570	604	580	618	573
Electrical engineering	854	698	523	681	768	747	962	1,070	1,192	1,326	1,368	1,418	1,526	1,558	1,571	1,545
Mechanical engineering	633	483	377	487	518	640	686	731	846	818	942	973	946	961	974	923
Materials engineering	302	267	259	271	281	347	341	335	391	412	424	457	456	493	489	467
Other engineering	822	764	633	695	706	753	791	916	966	1,049	1,042	1,115	1,043	1,121	1,222	1,156

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-25.
Earned doctoral degrees, by field and sex: 1970–97 (selected years)

Field	1970	1975	1980	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
								Female								
All degrees	3,971	7,201	9,408	10,744	11,307	11,432	11,819	12,513	13,106	13,873	14,436	15,122	15,819	16,414	16,945	17,322
Science and engineering	1,648	2,929	3,961	4,891	5,167	5,312	5,662	6,109	6,370	6,932	7,080	7,652	7,920	8,288	8,646	8,796
Natural sciences	780	1,143	1,536	1,984	2,057	2,171	2,393	2,536	2,663	2,840	3,022	3,218	3,368	3,494	3,711	3,755
Physical	227	264	322	467	510	528	567	619	661	679	770	780	828	878	842	833
Earth/atm/ocean	15	30	64	108	95	112	135	148	141	179	188	160	183	170	172	204
Biological & agricultural	538	849	1,150	1,409	1,452	1,531	1,691	1,769	1,861	1,982	2,064	2,278	2,357	2,446	2,697	2,718
Math/computer sciences	79	123	116	139	169	190	177	263	268	316	325	402	373	451	370	404
Mathematics	77	109	95	106	121	125	121	155	158	199	205	264	236	265	231	260
Computer sciences	2	14	21	33	48	65	56	108	110	117	120	138	137	186	139	144
Social & behavioral sciences	775	1,625	2,219	2,570	2,716	2,709	2,806	2,935	3,024	3,309	3,227	3,510	3,545	3,647	3,789	3,890
Psychology	444	873	1,311	1,541	1,599	1,698	1,681	1,800	1,913	1,996	1,928	2,088	2,102	2,180	2,328	2,324
Social sciences	331	752	908	1,029	1,117	1,011	1,125	1,135	1,111	1,313	1,299	1,422	1,443	1,467	1,461	1,566
Engineering	16	52	90	198	225	242	286	375	415	467	506	522	635	696	776	747
Chemical engineering	3	5	14	41	61	60	65	80	78	83	113	94	113	109	143	123
Civil engineering	1	5	11	20	21	18	30	54	49	41	50	54	80	76	79	80
Electrical engineering	3	16	17	35	38	32	48	67	84	79	115	125	147	173	169	150
Mechanical engineering	2	4	7	26	18	17	29	29	38	57	45	57	69	64	78	87
Materials engineering	1	5	14	32	24	45	33	45	49	77	61	78	83	95	83	106
Other engineering	6	17	27	44	63	70	81	100	117	130	122	114	143	179	224	201

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Science and Engineering Degrees: 1966-96*, NSF 97-335 (Arlington, VA: 1999); and *Science and Engineering Doctorate Awards: 1997*, NSF 99-323 (Arlington, VA: 1999).

See figures 4-17, 4-23, and 4-32 in Volume 1.

Appendix table 4-26.
Earned doctoral degrees, by field and citizenship: 1986–97

Field	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Total[a]												
All degrees	31,902	32,370	33,501	34,326	36,067	37,534	38,890	39,801	41,034	41,743	42,415	42,705
Science and engineering	19,437	19,894	20,933	21,731	22,867	24,023	24,675	25,443	26,205	26,535	27,230	26,847
Natural sciences[b]	8,483	8,655	9,172	9,185	9,763	10,164	10,437	10,530	11,082	11,033	11,392	11,256
Math and computer sciences	1,128	1,190	1,264	1,471	1,597	1,839	1,927	2,026	2,021	2,187	2,043	2,001
Social sciences[c]	6,450	6,337	6,310	6,532	6,613	6,806	6,873	7,189	7,280	7,307	7,490	7,538
Engineering	3,376	3,712	4,187	4,543	4,894	5,214	5,438	5,698	5,822	6,008	6,305	6,052
U.S. citizen												
All degrees	23,086	22,984	23,290	23,401	24,905	25,573	26,010	26,449	27,147	27,740	27,741	27,688
Science and engineering	13,022	12,966	13,368	13,468	14,167	14,629	14,559	14,932	15,166	15,487	15,621	15,744
Natural sciences[b]	6,139	6,070	6,281	6,226	6,506	6,590	6,502	6,462	6,646	6,601	6,557	6,720
Math and computer sciences	568	588	626	731	723	851	876	921	930	1,038	909	933
Social sciences[c]	4,932	4,750	4,681	4,647	4,981	5,102	5,072	5,321	5,375	5,462	5,564	5,403
Engineering	1,383	1,558	1,780	1,864	1,957	2,086	2,109	2,228	2,215	2,386	2,591	2,688
Non-U.S. citizen												
All degrees	6,709	7,190	7,817	8,274	9,791	11,168	11,933	12,191	13,153	13,129	13,375	11,376
Science and engineering	5,154	5,557	6,066	6,515	7,768	8,926	9,475	9,754	10,542	10,503	10,809	9,209
Natural sciences[b]	1,896	2,084	2,333	2,378	2,974	3,409	3,750	3,821	4,275	4,262	4,536	3,875
Math and computer sciences	478	528	567	617	797	964	996	1,043	1,061	1,096	1,067	919
Social sciences[c]	1,065	1,058	1,079	1,215	1,331	1,532	1,575	1,637	1,715	1,665	1,698	1,426
Engineering	1,715	1,887	2,087	2,305	2,666	3,021	3,154	3,253	3,491	3,480	3,508	2,989
Non-U.S. citizen with permanent visa												
All degrees	1,433	1,578	1,622	1,626	1,698	1,857	1,980	2,259	3,747	4,319	3,765	2,913
Science and engineering	994	1,089	1,130	1,124	1,197	1,285	1,383	1,641	3,021	3,509	3,007	2,261
Natural sciences[b]	321	380	429	403	437	473	537	630	1,460	1,761	1,510	1,089
Math and computer sciences	83	83	86	93	102	118	120	178	270	349	250	189
Social sciences[c]	247	271	249	263	269	306	315	364	453	443	455	390
Engineering	343	355	366	365	389	388	411	469	838	956	792	593
Non-U.S. citizen with temporary visa												
All degrees	5,276	5,612	6,195	6,648	8,093	9,311	9,953	9,932	9,406	8,810	9,610	8,463
Science and engineering	4,160	4,468	4,936	5,391	6,571	7,641	8,092	8,113	7,521	6,994	7,802	6,948
Natural sciences[b]	1,575	1,704	4,936	5,391	6,571	7,641	8,092	8,113	7,521	6,994	7,802	6,948
Math and computer sciences	395	445	481	524	695	846	876	865	791	747	817	730
Social sciences[c]	818	787	830	952	1,062	1,226	1,260	1,273	1,262	1,222	1,243	1,036
Engineering	1,372	1,532	1,721	1,940	2,277	2,633	2,743	2,784	2,653	2,524	2,716	2,396
Citizenship unknown												
All degrees	2,107	2,196	2,393	2,652	1,371	793	947	1,161	734	874	1,299	3,641
Science and engineering	1,261	1,371	1,498	1,749	933	468	641	757	497	545	800	1,894
Natural sciences[b]	448	446	557	582	284	165	185	247	161	170	299	661
Math and computer sciences	82	74	71	123	77	24	55	62	30	53	67	149
Social sciences[c]	453	529	550	670	301	172	226	231	190	180	228	709
Engineering	278	267	320	374	271	107	175	217	116	142	206	375

[a]Data include all doctorates awarded to U.S. citizens and permanent residents, temporary residents, and persons whose citizenship is unknown.

[b]Natural sciences here include physical, earth, atmospheric, oceanographic, biological, and agricultural sciences.

[c]Social sciences include psychology, sociology, and other social sciences.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Science and Engineering Doctorate Awards: 1999*, NSF 99-323 (Arlington, VA: 1999).

See figure 4-32 in Volume 1.

Appendix table 4-27.
Earned doctoral degrees in science and engineering in selected countries and regions: 1997 or most recent year

Region/country	All doctoral degrees	Degree field					
		All S&E doctoral degrees	Natural sciences[a]	Math & computer sciences	Agri-culture	Social sciences[b]	Engineering
Total, three world regions	159,235	90,577	38,643	6,048	6,176	15,417	24,293
Asia							
Total	35,219	18,513	6,533	609	2,363	1,029	7,979
China	6,042	5,328	1,678	334	348	325	2,643
India	9,070	4,000	2,950	NA	715	NA	335
Japan[c]	13,921	6,157	1,315	NA	1,043	388	3,411
South Korea	4,999	2,189	427	187	178	240	1,157
Taiwan	1,187	839	163	88	79	76	433
Europe							
Total	73,306	40,454	19,953	3,248	2,275	5,718	9,260
European Union	69,006	38,167	18,863	3,065	2,141	5,337	8,761
Austria	2,144	1,184	316	139	245	137	347
Belgium	602	373	191	19	66		97
Denmark	365	177	103	0	34	10	30
Finland	1,422	598	168	74	54	118	184
France	11,073	8,962	4,394	869	207	1,629	1,863
Germany	24,174	11,728	6,418	785	521	1,775	2,229
Greece	932	367	128	44	36	66	93
Ireland	423	307	234	13	14	10	36
Italy	3,463	1,643	770	22	156	85	610
The Netherlands	5,014	1,567	594	0	311	261	401
Spain	5,852	2,550	1,449	331	107	249	414
Sweden	2,549	1,580	473	204	102	181	620
United Kingdom	10,993	7,131	3,625	565	288	816	1,837
European Free Trade Assoc.	4,300	2,287	1,090	183	134	381	499
Norway	643	425	145	32	32	88	128
Switzerland	3,657	1,862	945	151	102	293	371
The Americas							
Total	50,710	31,610	12,157	2,191	1,538	8,670	7,054
North America	47,273	29,408	11,032	2,183	1,130	8,467	6,596
Canada	3,834	2,165	629	171	116	759	490
Mexico	734	396	113	11	48	170	54
United States	42,705	26,847	10,290	2,001	966	7,538	6,052
South America	3,437	2,202	1,125	8	408	203	458
Argentina	408	382	218	8	97	18	41
Brazil	2,972	1,775	862	NA	311	185	417
Chile	57	45	45	NA	0	0	0

NA = not available

NOTES: Data are compiled from numerous national and international sources, and degree fields may not be strictly comparable. Data for Austria, Canada, China, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, Norway, South Korea, Sweden, Taiwan, The United Kingdom, and the United States are for 1997. Data for Argentina, Belgium, Brazil, Chile, Mexico, Spain, and Switzerland are for 1996. Data for India and Greece are for 1994.

[a]Natural sciences here include physical, earth, atmospheric, oceanographic, and biological sciences.

[b]Social sciences include psychology, sociology, and other social sciences.

[c]Japanese data include "thesis" doctorates, called *Ronbun Hakase,* earned by employees in industry.

SOURCES: **ASIA: China**- National Research Center for Science and Technology for Development, unpublished tabulations; **India**- Department of Science and Technology, *Research and Development Statistics 1994-95* (New Delhi:1996); **Japan**- Ministry of Education, Science, and Culture (Monbusho), *Monbusho Survey of Education* (Tokyo: annual series); **South Korea**- Ministry of Education, *Statistical Yearbook of Education* (Seoul:1998); **Taiwan**- Ministry of Education, *Educational Statistics of the Republic of China: 1998* (Taipei: 1998); **EUROPEAN UNION: Austria**- Austrian Central Statistical Office, unpublished tabulations; **Denmark**- Department of Higher Education, Ministry of Education, unpublished tabulations (1997); **Finland**- Central Statistical Office, unpublished tabulations (1997), and Organisation for Economic Co-operation and Development and Centre for Educational Research and Innovation (OECD/CERI); **France**- Ministère de l'Éducation National, *Rapport sur les Études Doctorales* (Paris: 1998); **Germany**- Statistisches Bundesamt, *Prüfungen an Hochschulen* (Wiesbaden: 1998); **Greece**- OECD/CERI; **Ireland**- OECD/CERI; **Italy**- OECD/CERI; **The Netherlands**- Department for Statistics of Education and Science, Netherlands Central Bureau of Statistics, unpublished tabulations (1997); **Spain**- OECD/CERI; **Sweden**- Statistics Sweden, unpublished tabulations (1997), and OECD/CERI; **United Kingdom**- Higher Education Statistical Agency, *Students in Higher Education Institutions, 97/98* (Cheltenham: 1999); **EUROPEAN FREE TRADE ASSOCIATION: Norway**- Institute for Studies in Research and Higher Education, the Norwegian Research Council, unpublished tabulations (1997); **Switzerland**- Swiss Federal Statistical Office, unpublished tabulations (1997); **THE AMERICAS: Argentina**- Ministry of Education and Culture, unpublished tabulations (1999); **Brazil**- Ministério de Educação e Cultura, Coordenação de Aperfeiçoamento de Pessoal de Nivel Superior (CAPES) (Brasilia); **Canada**- Association of Universities and Colleges of Canada, unpublished tabulations (1998); **Chile**- Consejo de Rectores Universidades Chilenas, unpublished tabulations; **Mexico**- Asociación Nacional de Universidades y Instituciones de Educación Superior, *Anuario Estadístico 1997 Posgrado* (Mexico, 1997); and **United States**- National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Science and Engineering Doctorate Awards: 1997,* NSF 99-323 (Arlington, VA: 1999).

See figure 4-18 in Volume 1.

Appendix table 4-28.
Doctoral degrees in science and engineering in selected Western industrialized countries, by field: 1975–97

Country/degree field	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
France																							
Total Ph.D.s	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5,963	6,782	7,198	8,585	9,295	10,602	9,801	10,963	11,073
Total S&E	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,888	5,158	5,384	6,377	6,820	7,555	7,027	8,511	8,962
Natural sciences[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2,615	2,841	2,883	3,525	3,631	3,866	3,572	4,052	4,394
Math/computer sciences	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	722	795	831	976	1,065	1,203	1,129	1,241	869
Agricultural sciences	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	37	53	38	38	52	94	84	194	207
Social sciences[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	672	488	539	663	797	1,018	815	1,285	1,629
Engineering	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	842	981	1,093	1,175	1,275	1,374	1,427	1,739	1,863
Germany[c]																							
Total Ph.D.s	11,418	11,531	11,386	11,755	11,939	12,222	12,283	12,963	13,637	14,133	14,951	15,530	16,064	17,321	17,901	22,372	22,462	21,438	22,000	22,000	22,387	22,849	24,174
Total S&E	4,588	4,742	4,922	4,677	4,821	4,780	4,710	4,937	4,978	5,153	5,738	6,091	6,576	7,101	7,568	10,762	10,465	10,148	10,200	10,200	10,889	11,472	11,728
Natural sciences[a]	2,238	2,364	2,443	2,287	2,380	2,462	2,444	2,313	2,404	2,315	2,986	3,184	3,440	3,844	4,095	5,319	5,326	5,638	5,700	5,700	5,868	6,078	6,418
Math/computer sciences	242	250	294	242	273	227	213	261	274	239	274	278	294	332	383	429	418	464	500	500	663	810	785
Agricultural sciences	338	347	323	327	281	331	317	361	361	411	414	406	468	450	518	997	709	602	500	500	507	512	521
Social sciences[b]	1,015	1,042	1,024	995	959	949	913	1,012	966	1,014	968	1,064	1,068	1,150	1,200	1,544	1,483	1,344	1,400	1,400	1,741	1,803	1,775
Engineering	755	739	838	826	928	811	823	990	973	1,174	1,096	1,159	1,306	1,325	1,372	2,473	2,529	2,100	2,100	2,100	2,110	2,269	2,229
United Kingdom																							
Total Ph.D.s	5,341	5,210	5,331	5,601	5,700	5,804	5,983	6,333	6,528	6,291	6,208	6,492	6,835	7,588	7,845	8,242	8,387	8,396	8,717	9,000	9,761	9,974	10,993
Total S&E	4,023	3,981	4,115	4,235	4,222	4,287	4,463	4,738	4,759	4,567	4,608	4,759	5,016	5,663	5,816	6,207	6,302	6,112	6,098	6,325	6,512	6,583	7,131
Natural sciences[a]	2,082	2,070	2,155	2,192	2,303	2,300	2,389	2,515	2,426	2,408	2,409	2,495	2,583	2,787	2,937	3,113	3,151	3,054	3,034	3,200	3,356	3,373	3,625
Math/computer sciences	242	264	282	277	273	256	311	296	289	290	282	290	321	374	415	471	535	519	528	600	602	581	565
Agricultural sciences	209	167	208	194	185	176	195	190	183	223	159	260	192	244	238	241	248	279	275	325	351	299	288
Social sciences[b]	431	475	513	539	495	532	541	603	663	657	687	686	732	899	878	916	914	935	739	700	646	674	816
Engineering	1,059	1,005	957	1,033	966	1,023	1,027	1,134	1,198	989	1,071	1,028	1,188	1,359	1,348	1,466	1,454	1,325	1,522	1,500	1,557	1,656	1,837
United States																							
Total Ph.D.s	32,952	32,946	31,716	30,875	31,239	31,020	31,356	31,111	31,282	31,337	31,298	31,899	32,367	33,499	34,324	36,068	37,517	38,853	39,754	41,011	41,743	42,415	42,705
Total S&E	18,799	18,472	18,008	17,653	17,872	17,775	18,257	18,275	18,635	18,748	18,935	19,437	19,894	20,932	21,732	22,868	24,023	24,675	25,443	26,205	26,535	27,229	27,180
Natural sciences[a]	8,103	7,863	7,676	7,601	7,817	7,864	7,995	8,195	8,195	8,336	7,326	7,486	7,679	8,157	8,099	8,589	9,086	9,372	9,562	9,996	9,997	10,355	10,414
Math/computer sciences	1,147	1,003	964	959	979	962	960	940	987	993	998	1,128	1,190	1,264	1,471	1,597	1,839	1,927	2,024	2,022	2,188	2,043	2,030
Agricultural sciences	905	788	782	853	855	912	982	951	1,015	997	1,111	998	977	1,015	1,086	1,176	1,074	1,063	969	1,078	1,036	1,037	978
Social sciences[b]	6,538	6,768	6,720	6,668	6,582	6,470	6,774	6,494	6,672	6,506	6,335	6,450	6,337	6,310	6,532	6,614	6,806	6,873	7,190	7,289	7,307	7,490	7,660
Engineering	3,011	2,838	2,648	2,425	2,494	2,479	2,528	2,646	2,781	2,913	3,166	3,376	3,712	4,187	4,543	4,894	5,215	5,439	5,696	5,822	6,008	6,305	6,098

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-28.
Doctoral degrees in science and engineering in selected Western industrialized countries, by field: 1975–97

Country/degree field	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Summary, S&E doctoral degrees, by country																							
Total all countries	27,410	27,123	27,045	26,912	26,915	27,067	27,430	28,175	28,372	28,468	29,282	30,288	31,487	33,697	40,003	44,997	46,171	47,311	48,559	50,287	50,964	53,796	54,668
France	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,888	5,158	5,384	6,377	6,820	7,555	7,027	8,511	8,962
Germany	4,588	4,742	4,922	4,677	4,821	4,780	4,710	4,937	4,978	5,153	5,738	6,091	6,576	7,101	7,568	10,762	10,465	10,148	10,200	10,200	10,889	11,472	11,728
United Kingdom	4,023	3,981	4,115	4,235	4,222	4,287	4,463	4,738	4,759	4,567	4,608	4,759	5,016	5,663	5,816	6,207	6,302	6,112	6,098	6,325	6,512	6,583	7,131
United States	18,799	18,472	18,008	17,653	17,872	17,775	18,257	18,275	18,635	18,748	18,935	19,437	19,894	20,932	21,732	22,868	24,023	24,675	25,443	26,205	26,535	27,229	27,180

NA = not available

NOTE: French doctoral degrees are not available in the same data series before 1989.

[a]Natural sciences include physical, biological, earth, atmospheric, and oceanographic sciences.

[b]Social sciences include psychology, sociology, and other social sciences.

[c]The rise in the data from Germany in 1990 reflects the inclusion of degrees from former East Germany beginning in that year.

SOURCES: **France**- Ministère de l'Éducation Nationale, de la Recherche et de la Technologie, *Rapport sur les Éudes Doctorales* (Paris: 1998); **Germany**- *Statistisches Bundesamt, Prüfungen an Hochschulen* (Wiesbaden: 1998); **United Kingdom**- Higher Education Statistical Agency, *Students in Higher Education Institutions, 97/98* (Cheltenham: 1999); **United States**- National Science Foundation, Science Resources Studies Division, *Science and Engineering Doctorate Awards: 1997*, NSF 99-323 (Arlington, VA: 1999).

See figure 4-19 in Volume 1.

Appendix table 4-29.
Doctoral degrees in science and engineering in selected Asian countries, by field: 1975–97

Country/degree field	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
China																							
Total Ph.D.s	0	0	0	0	0	0	0	13	19	91	234	307	622	1,682	1,904	2,127	2,556	2,540	2,114	3,590	4,364	4,950	6,042
Total S&E	0	0	0	0	0	0	0	NA	NA	NA	125	127	218	797	1,024	1,069	1,198	1,357	1,895	2,741	3,417	4,428	5,328
Natural sciences[a]	0	0	0	0	0	0	0	NA	NA	NA	33	27	52	165	141	209	252	304	528	918	1,191	1,479	1,678
Math/computer sciences	0	0	0	0	0	0	0	NA	NA	NA	23	10	31	75	78	89	95	101	103	139	187	264	334
Agricultural sciences	0	0	0	0	0	0	0	NA	NA	NA	1	0	8	55	56	20	37	68	92	125	182	256	348
Social sciences[b]	0	0	0	0	0	0	0	NA	NA	NA	0	1	0	26	23	36	47	61	102	170	198	234	325
Engineering	0	0	0	0	0	0	0	NA	NA	NA	68	89	127	476	726	715	767	823	1,069	1,389	1,659	2,195	2,643
India																							
Total Ph.D.s	2,015	2,337	2,710	3,144	3,646	4,229	4,904	5,688	6,597	6,934	7,139	7,346	7,603	7,598	8,284	8,586	8,374	8,383	8,720	9,070	9,070	9,070	9,070
Total S&E	1,909	2,143	2,408	2,600	2,917	3,061	3,356	3,600	3,886	4,162	3,976	4,052	4,123	4,208	4,209	4,166	4,212	4,183	4,021	4,000	4,000	4,000	4,000
Natural sciences[a]	1,484	1,651	1,837	2,044	2,261	2,385	2,516	2,654	2,800	2,954	2,892	2,922	2,937	3,038	3,044	2,976	2,950	3,044	2,997	2,950	2,950	2,950	2,950
Math/computer sciences	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Agricultural sciences	289	317	348	422	480	483	558	566	575	698	575	576	583	576	579	583	633	688	701	715	715	715	715
Social sciences[b]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineering	136	174	223	134	176	193	282	380	511	510	509	554	603	594	586	607	629	451	323	335	335	335	335
Japan																							
Total Ph.D.s	4,592	5,138	5,322	5,648	5,812	6,269	6,599	6,810	7,233	7,477	7,978	8,533	9,157	9,602	10,036	10,633	10,758	10,885	11,576	12,160	12,645	13,820	13,921
Total S&E	2,127	2,371	2,492	2,478	2,515	2,611	2,632	2,631	2,676	2,802	3,088	3,095	3,248	3,511	3,561	3,704	3,874	4,056	4,438	4,877	5,205	6,006	6,157
Natural sciences[a]	676	717	843	782	814	822	791	762	774	807	860	820	837	881	876	835	863	892	1,009	1,132	1,182	1,243	1,315
Math/computer sciences	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Agricultural sciences	381	490	518	442	430	527	529	521	515	614	697	646	715	746	734	719	791	870	824	894	956	1,108	1,043
Social sciences[b]	84	85	88	88	76	76	76	93	97	90	127	136	149	167	177	183	191	200	243	241	276	358	388
Engineering	986	1,079	1,043	1,166	1,195	1,186	1,236	1,255	1,290	1,291	1,404	1,493	1,547	1,717	1,774	1,967	2,029	2,094	2,362	2,610	2,791	3,297	3,411
South Korea																							
Total Ph.D.s	557	557	566	574	583	592	601	610	845	1,109	1,400	1,645	1,906	2,125	2,458	2,481	2,984	3,211	3,583	3,999	4,462	4,723	4,999
Total S&E	128	128	99	116	139	169	212	269	281	360	548	631	759	871	984	945	1,135	1,228	1,421	1,650	1,920	2,046	2,189
Natural sciences[a]	29	29	22	30	41	55	75	102	83	124	212	201	277	207	192	170	225	202	244	296	358	391	427
Math/computer sciences	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73	105	75	99	106	124	145	169	178	187
Agricultural sciences	48	48	40	43	45	48	52	55	60	77	89	105	110	155	175	154	156	151	172	196	223	199	178
Social sciences[b]	31	31	23	23	24	24	25	25	41	39	50	52	102	90	97	107	189	217	222	227	232	236	240
Engineering	20	20	14	20	29	42	60	87	97	120	197	273	270	346	415	439	466	552	659	786	938	1,042	1,157
Taiwan																							
Total Ph.D.s	37	37	45	28	43	64	64	74	86	99	115	200	225	249	314	410	410	608	701	808	848	1,053	1,187
Total S&E	21	21	24	17	26	30	49	44	58	85	109	172	197	197	257	312	370	450	513	592	650	783	839
Natural sciences[a]	2	2	4	7	4	6	8	5	8	14	20	22	35	35	42	47	62	82	97	115	115	154	163
Math/computer sciences	0	0	0	0	1	1	1	3	4	2	4	13	14	14	18	24	32	42	45	49	55	63	88
Agricultural sciences	4	4	4	5	7	5	15	8	17	15	10	28	28	28	36	33	36	39	48	60	63	65	79
Social sciences[b]	7	7	13	2	6	8	10	13	15	23	16	26	22	22	41	43	31	23	36	56	44	66	76
Engineering	8	8	3	3	8	10	15	15	14	31	59	83	98	98	120	165	209	264	287	312	373	435	433

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-29.
Doctoral degrees in science and engineering in selected Asian countries, by field: 1975–97

Country/degree field	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Summary, S&E doctoral degrees, by country																							
Total Asia	4,185	4,663	5,023	5,211	5,597	5,871	6,249	6,544	6,901	7,409	7,846	8,077	8,545	9,584	10,035	10,196	10,789	11,274	12,288	13,860	15,192	17,263	18,513
China	0	0	0	0	0	0	0	0	0	0	125	127	218	797	1,024	1,069	1,198	1,357	1,895	2,741	3,417	4,428	5,328
India	1,909	2,143	2,408	2,600	2,917	3,061	3,356	3,600	3,886	4,162	3,976	4,052	4,123	4,208	4,209	4,166	4,212	4,183	4,021	4,000	4,000	4,000	4,000
Japan	2,127	2,371	2,492	2,478	2,515	2,611	2,632	2,631	2,676	2,802	3,088	3,095	3,248	3,511	3,561	3,704	3,874	4,056	4,438	4,877	5,205	6,006	6,157
South Korea	128	128	99	116	139	169	212	269	281	360	548	631	759	871	984	945	1,135	1,228	1,421	1,650	1,920	2,046	2,189
Taiwan	21	21	24	17	26	30	49	44	58	85	109	172	197	197	257	312	370	450	513	592	650	783	839

NA = not available

NOTES: Japanese data include "thesis" doctorates, called *Ronbun Hakase,* earned by employees in industry. In Japanese higher education data, mathematics is included in natural sciences; computer science is included in engineering.

[a]Natural sciences include physical, biological, earth, atmospheric, and oceanographic sciences.

[b]Social sciences include psychology, sociology, and other social sciences.

SOURCES: **China**- National Research Center for Science and Technology for Development, unpublished tabulations; **India**- Department of Science and Technology, *Research and Development Statistics 1994- 95* (New Delhi: 1996); **Japan**- Ministry of Education, Science, and Culture (Monbusho), *Monbusho Survey of Education* (Tokyo: annual series); **South Korea**- Ministry of Education, *Statistical Yearbook of Education* (Seoul:1998); **Taiwan**- Ministry of Education, *Educational Statistics of the Republic of China: 1998* (Taipei: 1998).

See figures 4-20 and 4-23 in Volume 1.

Appendix table 4-30.
Doctoral science and engineering degrees earned by Asian students within Asian and U.S. universities: 1975–97

Year	Within Asian universities[a]	Within U.S. universities[b]
1975	4,185	NA
1976	4,663	NA
1977	5,023	NA
1978	5,211	NA
1979	5,597	NA
1980	5,871	991
1981	6,249	1,031
1982	6,544	1,168
1983	6,901	1,339
1984	7,409	1,531
1985	7,846	1,761
1986	8,077	1,889
1987	8,545	2,218
1988	9,584	2,511
1989	10,035	2,872
1990	10,196	4,008
1991	10,789	4,911
1992	11,274	5,406
1993	12,288	5,628
1994	13,860	6,229
1995	15,192	6,352
1996	17,263	6,852
1997	18,513	5,575

NA = not available

[a]Data include S&E doctoral degrees earned within universities of selected Asian countries: China, India, Japan, South Korea, and Taiwan.

[b]Asian students in U.S. universities include those on either temporary or permanent visas from the above countries plus Hong Kong and Thailand.

SOURCES: **China**- National Research Center for Science and Technology for Development, unpublished tabulations (1997); **India**- Department of Science and Technology, *Research and Development Statistics 1994- 95* (New Delhi: 1996); **Japan**- Ministry of Education, Science and Culture (Monbusho), *Monbusho Survey of Education* (Tokyo: annual series); **South Korea**- Ministry of Education, *Statistical Yearbook of Education, 1998* (Seoul: 1999); **Taiwan**- Ministry of Education, *Education Statistics of the Republic of China*, 1997 (Taipei: 1998); **United States**- National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Science and Engineering Degrees: 1960- 84*, and *Science and Engineering Doctorate Awards: 1997*, NSF 99-323 (Arlington, VA: 1999).

See figure 4-21 in Volume 1.

Appendix table 4-31.
Doctoral science and engineering degrees earned by Chinese students within Chinese and U.S. universities: 1987–97

Year	Within U.S. universities	Within Chinese universities
1987	293	218
1988	480	797
1989	620	1,024
1990	1,150	1,069
1991	1,793	1,198
1992	2,045	1,357
1993	2,227	1,704
1994	2,531	2,602
1995	2,752	3,230
1996	2,952	4,428
1997	2,223	5,328

SOURCES: **United States**- National Science Foundation, Science Resources Studies Division, Selected Tables from *Science and Engineering Doctorate Awards: 1997*, NSF 99-323 (Arlington, VA: 1999); and **China**- National Research Center for Science and Technology for Development, unpublished tabulations.

See figure 4-22 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 4-32.
Undergraduate enrollment, by race/ethnicity, citizenship, and sex: 1978–96 (selected years)

Race/ethnicity and citizenship	1978	1980	1982	1984	1986	1988	1990	1992	1993	1994	1995	1996
Total												
Total	9,808,815	9,821,513	10,205,475	10,081,336	10,952,167	11,453,788	12,011,657	12,693,778	12,482,813	12,417,701	12,399,826	12,424,570
White	7,872,635	7,827,035	8,060,213	7,635,957	8,406,100	8,737,576	9,232,090	9,388,226	9,101,085	8,905,614	8,806,202	8,731,457
Asian/Pacific Islander	206,065	225,422	280,062	296,123	384,004	431,053	491,134	620,463	642,893	683,131	700,828	721,773
Black	968,059	968,481	956,510	860,322	982,214	1,002,515	1,125,591	1,282,732	1,292,621	1,319,262	1,336,052	1,354,910
Hispanic	501,053	523,021	582,726	547,837	691,621	741,814	840,370	1,032,817	1,064,348	1,120,929	1,167,472	1,218,711
American Indian/Alaskan Native	71,891	70,553	74,123	66,120	81,356	84,108	95,135	110,879	112,727	117,856	120,728	122,943
Foreign citizen	170,517	201,034	212,999	200,146	199,921	202,815	227,337	258,661	269,139	270,909	268,544	274,776
Male												
Total	4,814,322	4,723,979	4,910,480	4,787,658	5,078,768	5,192,254	5,396,557	5,644,113	5,547,126	5,484,342	5,467,370	5,475,620
White	3,884,778	3,785,209	3,881,826	3,635,294	3,908,642	3,979,958	4,165,862	4,195,726	4,067,289	3,958,270	3,918,342	3,890,906
Asian/Pacific Islander	108,261	117,574	148,969	156,947	201,591	221,673	250,287	308,564	318,289	335,737	342,084	350,740
Black	416,816	407,497	400,746	352,703	396,749	395,359	440,209	496,123	500,194	503,381	507,380	513,676
Hispanic	244,149	244,444	270,386	250,043	313,108	329,866	371,232	453,488	467,155	490,827	505,162	523,717
American Indian/Alaskan Native	33,481	31,621	33,589	29,498	35,592	35,501	39,692	46,572	47,233	48,920	50,223	51,008
Foreign citizen	116,583	134,864	143,000	132,496	127,364	122,320	129,275	143,640	146,966	147,207	144,179	145,573
Female												
Total	4,994,493	5,097,534	5,294,995	5,293,678	5,873,399	6,261,534	6,615,100	7,049,665	6,935,687	6,933,359	6,932,456	6,948,950
White	3,987,857	4,041,826	4,178,387	4,000,663	4,497,458	4,757,618	5,066,228	5,192,500	5,033,796	4,947,344	4,887,860	4,840,551
Asian/Pacific Islander	97,804	107,848	131,093	139,176	182,413	209,380	240,847	311,899	324,604	347,394	358,744	371,033
Black	551,243	560,984	555,764	507,619	585,465	607,156	685,382	786,609	792,427	815,881	828,672	841,234
Hispanic	256,904	278,577	312,340	297,794	378,513	411,948	469,138	579,329	597,193	630,102	662,310	694,994
American Indian/Alaskan Native	38,410	38,932	40,534	36,622	45,764	48,607	55,443	64,307	65,494	68,936	70,505	71,935
Foreign citizen	53,934	66,170	69,999	67,650	72,557	80,495	98,062	115,021	122,173	123,702	124,365	129,203

SOURCES: National Center for Education Statistics (NCES), *Trends in Racial/Ethnic Enrollment in Higher Education: Fall 1982 Through Fall 1996* (Washington, DC: U.S. Government Printing Office, 1999); and NCES, unpublished tabulations.

See page 4-26 in Volume 1.

Appendix table 4-33.
Undergraduate enrollment in engineering, by sex, race/ethnicity, and citizenship: 1979–98

				Race/ethnicity for U.S. citizens						
							Underrepresented minorities			
		Sex			Asian				American	Foreign
	Total	Male	Female	White	American	Total	Black	Hispanic	Indian	National
				Number						
1979	366,299	321,868	44,431	302,566	12,243	28,729	15,842	12,068	819	22,761
1981	420,402	361,133	59,269	343,649	15,815	34,353	18,911	14,359	1,083	26,585
1983	441,205	372,374	68,831	354,329	23,007	37,432	19,698	16,462	1,272	26,437
1984	429,499	362,800	66,699	340,374	25,449	37,557	19,204	17,075	1,278	26,119
1985	420,864	354,612	66,252	323,899	28,767	39,657	19,819	18,598	1,240	28,541
1986	407,657	344,999	62,658	315,861	30,201	37,240	18,459	17,586	1,195	24,355
1987	392,198	331,917	60,281	296,749	32,795	38,640	19,142	18,253	1,245	24,014
1988	385,412	325,024	60,388	288,415	34,051	40,389	20,405	18,700	1,284	22,557
1989	378,277	318,067	60,210	281,948	33,360	41,338	21,013	19,007	1,318	21,631
1990	380,287	319,506	60,781	288,732	30,898	41,169	20,833	18,873	1,463	19,488
1991	379,977	316,719	63,258	271,906	37,803	48,692	24,563	22,441	1,688	21,576
1992	382,525	316,460	66,065	270,942	38,480	51,517	25,722	23,863	1,932	21,586
1993	375,944	309,412	66,532	263,073	37,835	52,437	25,920	24,586	1,931	22,599
1994	367,298	300,643	66,655	256,287	37,009	52,188	24,994	25,216	2,028	21,764
1995	363,315	296,029	67,286	249,896	38,329	53,670	25,569	25,998	2,103	21,420
1996	356,177	288,559	67,618	248,062	37,873	53,801	24,922	26,483	2,396	21,233
1997	365,358	294,593	70,765	246,950	39,475	57,811	24,809	30,580	2,422	21,122
1998	366,991	294,598	72,393	248,439	40,523	56,919	25,699	28,802	2,418	21,110
				Percent						
1979	100.0	87.9	12.1	82.6	3.3	7.8	4.3	3.3	0.2	6.2
1981	100.0	85.9	14.1	81.7	3.8	8.2	4.5	3.4	0.3	6.3
1983	100.0	84.4	15.6	80.3	5.2	8.5	4.5	3.7	0.3	6.0
1984	100.0	84.5	15.5	79.2	5.9	8.7	4.5	4.0	0.3	6.1
1985	100.0	84.3	15.7	77.0	6.8	9.4	4.7	4.4	0.3	6.8
1986	100.0	84.6	15.4	77.5	7.4	9.1	4.5	4.3	0.3	6.0
1987	100.0	84.6	15.4	75.7	8.4	9.9	4.9	4.7	0.3	6.1
1988	100.0	84.3	15.7	74.8	8.8	10.5	5.3	4.9	0.3	5.9
1989	100.0	84.1	15.9	74.5	8.8	10.9	5.6	5.0	0.3	5.7
1990	100.0	84.1	16.0	75.9	8.1	10.8	5.5	5.0	0.4	5.1
1991	100.0	83.4	16.6	71.6	9.9	12.8	6.5	5.9	0.4	5.7
1992	100.0	82.7	17.3	70.8	10.1	13.5	6.7	6.2	0.5	5.6
1993	100.0	82.3	17.7	70.0	10.1	13.9	6.9	6.5	0.5	6.0
1994	100.0	81.9	18.1	69.8	10.1	14.2	6.8	6.9	0.6	5.9
1995	100.0	81.5	18.5	68.8	10.5	14.8	7.0	7.2	0.6	5.9
1996	100.0	79.4	18.6	67.0	10.4	14.8	6.9	7.3	0.7	5.8
1997	100.0	80.6	19.4	67.6	10.8	15.8	6.8	8.4	0.7	5.8
1998	100.0	80.3	19.7	67.7	11.0	15.5	7.0	7.8	0.7	5.8

NOTE: The large jump in the percentage of engineering enrollment by minorities in 1990-91 may be an artifact of more careful reporting of race/ethnicity after the 1990 census rather than significant increases in engineering enrollment in one year. That is, in previous years, minorities may have underreported their race/ethnicity.

SOURCE: Engineering Workforce Commission, *Engineering and Technology Enrollments, Fall 1998* (Washington, DC: American Association of Engineering Societies,1999).

See figure 4-25 in Volume 1.

Appendix table 4-34.
Earned associate's degrees, by field and race/ethnicity: 1977–96 (selected years)

Field	1977	1979	1981	1985	1987	1989	1990	1991	1992	1993	1994	1995	1996
Total													
All degrees	409,942	407,471	420,910	459,087	440,816	440,375	459,048	486,297	508,704	519,098	546,574	544,094	540,644
Science and engineering	NA	NA	NA	25,957	22,167	19,479	19,406	19,154	22,361	23,118	25,172	23,644	23,829
Natural sciences[a]	NA	NA	NA	4,691	3,950	3,952	4,286	4,430	4,859	5,090	5,793	5,790	6,101
Math and computer sciences	NA	NA	NA	13,679	9,953	8,846	8,600	8,640	10,346	10,255	10,532	10,230	9,956
Social sciences[b]	NA	NA	NA	3,664	3,676	3,949	4,118	3,574	4,441	5,248	6,019	5,348	5,742
Engineering	NA	NA	NA	3,923	4,588	2,732	2,402	2,510	2,715	2,525	2,828	2,276	2,030
Engineering technology	38,244	40,891	51,661	51,579	47,434	46,180	44,739	42,595	38,015	38,473	39,889	36,956	33,597
Non-science and -engineering	NA	NA	NA	433,130	418,649	420,896	439,642	467,143	486,343	495,980	521,402	520,450	516,815
White													
All degrees	342,382	331,173	339,183	355,422	345,546	330,557	343,629	376,869	388,049	392,637	419,962	408,126	403,072
Science and engineering	NA	NA	NA	18,133	16,169	13,898	13,684	13,842	15,487	15,631	17,809	16,310	16,177
Natural sciences[a]	NA	NA	NA	3,548	3,078	3,231	3,458	3,574	3,878	3,989	4,493	4,326	4,606
Math and computer sciences	NA	NA	NA	10,255	7,360	6,044	5,704	6,054	6,631	6,515	7,133	6,809	6,535
Social sciences[b]	NA	NA	NA	2,070	2,496	2,637	2,752	2,347	2,892	3,241	4,050	3,524	3,552
Engineering	NA	NA	NA	2,260	3,235	1,986	1,770	1,867	2,086	1,886	2,133	1,651	1,484
Engineering technology	33,109	33,662	40,804	40,934	37,383	33,584	31,699	33,792	28,242	28,442	31,457	27,737	25,480
Non-science and -engineering	NA	NA	NA	337,289	329,377	316,659	329,945	363,027	372,562	377,006	402,153	391,816	386,895
Asian/Pacific Islander													
All degrees	7,174	7,617	8,757	10,165	11,329	11,761	12,687	15,069	15,369	16,280	18,555	20,976	22,630
Science and engineering	NA	NA	NA	828	1,051	834	851	842	1,118	1,108	1,283	1,353	1,469
Natural sciences[a]	NA	NA	NA	86	112	120	179	220	253	228	304	331	388
Math and computer sciences	NA	NA	NA	511	464	401	411	388	548	528	566	603	615
Social sciences[b]	NA	NA	NA	47	106	119	110	88	132	216	229	267	320
Engineering	NA	NA	NA	184	369	194	151	146	185	136	184	152	146
Engineering technology	781	1,132	1,641	1,570	1,989	1,663	1,499	1,496	1,311	1,358	1,258	1,387	1,391
Non-science and -engineering	NA	NA	NA	9,337	10,278	10,927	11,836	14,227	14,251	15,172	17,272	19,623	21,161
Black													
All degrees	33,176	34,985	35,330	35,861	33,858	32,185	32,882	37,854	38,721	41,260	45,597	45,923	49,245
Science and engineering	NA	NA	NA	1,653	1,766	1,460	1,540	1,631	1,809	1,963	2,069	2,033	2,109
Natural sciences[a]	NA	NA	NA	160	198	125	153	149	161	178	206	276	247
Math and computer sciences	NA	NA	NA	938	961	828	876	921	1,093	1,004	1,120	1,060	1,124
Social sciences[b]	NA	NA	NA	407	358	387	423	435	420	580	564	549	604
Engineering	NA	NA	NA	148	249	120	88	126	135	201	179	148	134
Engineering technology	1,990	2,022	2,903	3,395	3,100	2,829	2,648	3,030	2,445	2,698	3,197	2,932	2,883
Non-science and -engineering	NA	NA	NA	34,208	32,092	30,725	31,342	36,223	36,912	39,297	43,528	43,890	47,136

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-34.
Earned associate's degrees, by field and race/ethnicity: 1977–96 (selected years)

Field	1977	1979	1981	1985	1987	1989	1990	1991	1992	1993	1994	1995	1996
Hispanic													
All degrees	19,808	20,710	22,088	22,783	22,804	23,475	24,569	29,019	30,253	33,015	35,557	38,499	39,115
Science and engineering	NA	NA	NA	1,380	1,635	1,453	1,289	1,463	1,773	2,152	2,329	2,316	2,310
Natural sciences[a]	NA	NA	NA	248	281	236	215	232	238	300	404	425	419
Math and computer sciences	NA	NA	NA	676	620	609	591	677	918	1,086	1,074	1,131	1,031
Social sciences[b]	NA	NA	NA	330	365	432	385	401	485	613	703	599	728
Engineering	NA	NA	NA	126	369	176	98	153	132	153	148	161	132
Engineering technology	1,644	1,799	2,219	2,084	2,359	2,232	2,298	2,411	2,317	2,398	2,478	2,687	2,644
Non-science and -engineering	NA	NA	NA	21,403	21,169	22,022	23,280	27,556	28,480	30,863	33,228	36,183	36,805
American Indian/Alaskan Native													
All degrees	2,499	2,336	2,584	2,953	3,049	3,102	3,290	3,772	3,874	4,213	4,879	5,352	5,221
Science and engineering	NA	NA	NA	163	195	182	202	257	247	315	419	410	464
Natural sciences[a]	NA	NA	NA	45	49	44	38	66	58	73	125	123	116
Math and computer sciences	NA	NA	NA	56	49	67	84	91	69	116	116	124	136
Social sciences[b]	NA	NA	NA	51	70	59	68	79	106	118	160	142	201
Engineering	NA	NA	NA	11	27	12	12	21	14	8	18	21	11
Engineering technology	204	191	285	267	219	257	168	232	175	210	263	260	242
Non-science and -engineering	NA	NA	NA	2,790	2,854	2,920	3,088	3,515	3,627	3,898	4,460	4,942	4,757
Foreign citizen													
All degrees	3,331	4,554	6,645	6,426	4,485	5,969	5,937	6,977	8,027	9,024	10,169	9,911	10,022
Science and engineering	NA	NA	NA	616	408	461	362	368	520	637	707	707	718
Natural sciences[a]	NA	NA	NA	74	81	97	75	73	109	138	157	177	164
Math and computer sciences	NA	NA	NA	313	177	205	169	171	251	284	282	298	291
Social sciences[b]	NA	NA	NA	73	30	76	48	56	80	137	179	156	193
Engineering	NA	NA	NA	156	120	83	70	68	80	78	89	76	70
Engineering technology	393	585	1,055	680	575	533	467	526	504	380	414	412	332
Non-science and -engineering	NA	NA	NA	5,810	4,077	5,508	5,575	6,609	7,507	8,387	9,462	9,204	9,304

NA = not available

NOTES: Data on associate's degrees are not available for broad science and engineering fields before 1983. Data by racial/ethnic group were collected on a biennial schedule until 1990. Data by racial/ethnic group are collected by broad field of study only; therefore, these data cannot be adjusted to the exact field taxonomies used by the National Science Foundation.

[a]Natural sciences here include physical, earth, atmospheric, oceanographic, biological, and agricultural sciences.

[b]Social sciences include psychology, sociology, and other social sciences.

SOURCES: National Center for Education Statistics (NCES), Earned Degrees and Completion Surveys, unpublished tabulations; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), unpublished tabulations.

See figure 4-34 in Volume 1.

Appendix table 4-35.
Earned bachelor's degrees, by field, race/ethnicity, and citizenship: 1977–96 (selected years)

Field and race/ethnicity	1977	1979	1981	1985	1987	1989	1991	1993	1994	1995	1996
Total											
All degrees	928,228	931,340	946,877	990,877	1,003,532	1,030,171	1,107,997	1,179,278	1,183,141	1,174,436	1,179,815
Science and engineering	337,834	334,632	337,739	342,970	343,070	337,431	356,785	388,435	395,380	399,809	405,921
Natural sciences[a]	98,342	96,186	90,254	75,670	68,929	63,073	65,401	77,395	83,903	91,026	98,520
Math and computer sciences	20,729	20,670	26,406	54,388	56,442	46,277	40,194	39,347	38,889	38,421	37,606
Social sciences[b]	169,086	154,976	145,684	135,341	143,276	161,134	189,004	209,023	209,626	207,032	206,729
Engineering	49,677	62,800	75,395	77,571	74,423	66,947	62,186	62,670	62,962	63,330	63,066
Engineering technology	NA	NA	NA	20,533	20,577	20,098	18,294	16,987	16,654	16,542	16,156
Non-science and -engineering	590,394	596,708	609,138	647,907	660,462	692,740	751,212	790,843	787,761	774,627	773,894
U.S. citizen or permanent resident											
All degrees	910,835	911,637	923,906	950,118	948,563	980,064	1,052,610	1,122,276	1,123,862	1,110,512	1,142,028
Science and engineering	329,351	324,750	324,724	325,172	319,963	317,950	335,424	366,357	372,858	375,745	391,074
Natural sciences[a]	96,268	94,101	88,001	72,860	65,632	60,423	62,117	73,571	80,096	86,688	96,179
Math and computer sciences	20,138	19,926	25,172	50,904	51,449	42,245	36,549	35,864	35,283	34,709	34,868
Social sciences[b]	166,852	152,720	143,165	131,499	135,722	154,321	180,423	199,948	200,256	197,120	201,705
Engineering	46,093	58,003	68,386	69,909	67,160	60,961	56,335	56,974	57,223	57,228	58,304
Engineering technology	NA	NA	NA	19,120	19,359	18,942	17,080	16,109	16,161	15,992	15,232
Non-science and -engineering	581,484	586,887	599,182	624,946	628,600	662,114	717,186	755,919	751,004	734,767	750,954
White, all degrees	807,857	802,665	807,509	826,356	819,477	840,326	892,363	931,603	918,124	892,785	884,128
Science and engineering	292,802	287,126	284,166	281,394	272,090	266,862	278,190	297,171	297,616	294,773	295,082
Natural sciences[a]	88,308	85,403	78,778	63,592	55,898	50,580	51,113	59,577	64,291	68,700	73,414
Math and computer sciences	18,110	17,633	22,013	43,484	42,446	33,998	28,998	27,824	26,905	25,875	25,293
Social sciences[b]	144,312	131,439	122,519	113,326	117,255	132,203	152,917	164,917	161,733	156,472	153,277
Engineering	42,072	52,651	60,856	60,992	56,491	50,081	45,162	44,853	44,687	43,726	43,098
Engineering technology	NA	NA	NA	16,673	16,541	16,156	14,279	13,245	12,909	12,616	12,032
Non-science and -engineering	515,055	515,539	523,343	544,962	547,387	573,464	614,173	634,432	620,508	598,012	589,046
Asian/Pacific Islander, all degrees	13,907	15,542	18,908	25,562	31,921	37,573	41,725	50,587	54,675	59,295	63,117
Science and engineering	6,203	7,171	9,145	13,323	16,934	19,138	20,552	24,504	26,420	29,128	31,031
Natural sciences[a]	1,935	2,227	2,406	2,880	3,641	3,973	4,670	6,364	7,228	8,677	9,829
Math and computer sciences	479	587	1,061	2,929	3,489	3,287	2,925	3,160	3,173	3,330	3,383
Social sciences[b]	2,578	2,499	2,612	3,032	4,214	5,803	6,737	8,573	9,503	10,336	11,020
Engineering	1,211	1,858	3,066	4,482	5,590	6,075	6,220	6,407	6,516	6,785	6,799
Engineering technology	0	0	0	542	807	839	768	768	720	727	730
Non-science and -engineering	7,704	8,371	9,763	12,239	14,987	18,435	21,173	26,083	28,255	30,167	32,086
Black, all degrees	58,700	60,301	60,729	57,563	55,103	56,837	65,009	76,667	82,316	85,287	89,554
Science and engineering	19,552	18,827	18,895	17,040	17,230	17,385	19,987	24,421	26,289	27,528	29,055
Natural sciences[a]	3,416	3,541	3,561	3,096	2,870	2,756	3,026	3,794	4,169	4,528	5,274
Math and computer sciences	1,073	1,159	1,371	2,913	3,654	3,249	2,808	3,178	3,390	3,493	3,396
Social sciences[b]	13,678	12,352	11,514	8,992	8,391	9,313	11,924	14,872	16,071	16,662	17,385
Engineering	1,385	1,775	2,449	2,039	2,315	2,067	2,229	2,577	2,659	2,845	3,000
Engineering technology	0	0	0	1,277	1,269	1,208	1,227	1,132	1,249	1,319	1,370
Non-science and -engineering	39,148	41,474	41,834	40,523	37,873	39,452	45,022	52,246	56,027	57,759	60,499

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-35.
Earned bachelor's degrees, by field, race/ethnicity, and citizenship: 1977–96 (selected years)

Field and race/ethnicity	1977	1979	1981	1985	1987	1989	1991	1993	1994	1995	1996
Hispanic, all degrees	27,043	29,719	33,167	36,391	38,196	41,361	49,027	57,845	62,683	66,691	71,015
Science and engineering	9,628	10,432	11,312	12,031	12,419	13,327	15,351	18,442	20,529	22,190	23,791
Natural sciences[a]	2,271	2,634	2,958	2,979	2,964	2,849	3,010	3,468	3,970	4,276	4,899
Math and computer sciences	435	495	688	1,380	1,696	1,568	1,695	1,566	1,678	1,843	1,865
Social sciences[b]	5,632	5,748	5,846	5,485	5,205	6,349	8,080	10,447	11,738	12,420	13,296
Engineering	1,290	1,555	1,820	2,187	2,554	2,561	2,566	2,961	3,143	3,651	3,731
Engineering technology	0	0	0	525	664	634	731	853	813	883	988
Non-science and -engineering	17,415	19,287	21,855	24,360	25,777	28,034	33,676	39,403	42,154	44,501	47,224
American Indian/Alaskan Native, all degrees	3,328	3,410	3,593	4,246	3,866	3,967	4,486	5,574	6,064	6,454	6,813
Science and engineering	1,166	1,194	1,206	1,384	1,290	1,238	1,344	1,819	2,004	2,126	2,268
Natural sciences[a]	338	296	298	313	259	265	298	368	438	507	559
Math and computer sciences	41	52	39	198	164	143	123	136	137	168	142
Social sciences[b]	652	682	674	664	657	653	765	1,139	1,211	1,230	1,324
Engineering	135	164	195	209	210	177	158	176	218	221	243
Engineering technology	0	0	0	103	78	105	75	111	98	115	112
Non-science and -engineering	2,162	2,216	2,387	2,862	2,576	2,729	3,142	3,755	4,060	4,328	4,545
Foreign citizen											
All degrees	15,744	17,853	22,631	29,258	28,592	26,457	29,657	32,371	34,227	37,012	37,787
Science and engineering	8,297	9,798	12,966	14,071	13,677	12,323	12,724	13,802	13,929	14,754	14,847
Natural sciences[a]	2,042	2,061	2,251	2,132	1,786	1,744	1,941	2,330	2,114	2,262	2,323
Math and computer sciences	583	741	1,233	2,879	3,233	2,678	2,615	2,756	2,835	2,888	2,738
Social sciences[b]	2,098	2,232	2,519	2,870	2,769	2,829	3,586	4,211	4,440	4,794	5,024
Engineering	3,574	4,764	6,963	6,190	5,889	5,072	4,582	4,505	4,540	4,810	4,762
Engineering technology	NA	NA	NA	1,277	986	659	712	441	493	550	585
Non-science and -engineering	7,447	8,055	9,665	15,187	14,915	14,134	16,933	18,569	20,298	22,258	22,940

NA = not available

NOTES: Data by racial/ethnic group were collected on a biennial schedule until 1990 and annually thereafter. Data for 1983 are not available. Data by racial/ethnic group are collected by broad fields of study only; therefore, these data cannot be adjusted to the exact field taxonomies used by the National Science Foundation.

[a]Natural sciences here include physical, earth, atmospheric, oceanographic, biological, and agricultural sciences.

[b]Social sciences include psychology, sociology, and other social sciences.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Science and Engineering Degrees, by Race/Ethnicity of Recipients: 1977-96* (Arlington, VA: 1998).

See figures 4-28 and 4-34 in Volume 1.

Appendix table 4-36.
First university degrees, and ratio of first university degrees and science and engineering degrees to the 24-year-old population, in selected countries, by sex: 1997 or most recent year

Region/country	All first university degrees	Science & engineering degrees	Degree fields: Natural sciences[b]	Degree fields: Social sciences[c]	Degree fields: Engineering	Total number of 24-year-olds	Ratio of[a]: First university degrees to 24 year-old population	Ratio of[a]: NS&E degrees to 24 year-old population	Ratio of[a]: Social science degrees to 24 year-old population
Male									
Asia									
Japan	342,703	285,295	24,326	166,415	94,554	1,020,126	33.6	11.7	16.3
South Korea	115,634	66,149	19,358	11,145	35,646	452,956	25.5	12.1	2.5
Taiwan	38,473	21,425	7,185	2,172	12,068	176,512	21.8	10.9	1.2
Europe									
Germany	73,587	47,482	15,324	16,954	15,204	441,734	16.7	6.9	3.8
United Kingdom[d]	122,290	53,864	25,726	8,817	19,321	377,419	32.4	11.9	2.3
North America									
Canada	51,046	25,881	9,242	10,208	6,431	190,600	26.8	8.2	5.4
Mexico	99,136	47,637	12,568	8,391	26,678	1,043,000	9.5	3.8	0.8
United States	528,000	203,341	76,623	74,920	51,798	1,864,000	28.3	6.9	4.0
Female									
Asia									
Japan	181,809	66,058	10,457	47,204	8,397	970,675	18.7	1.9	4.9
South Korea	80,932	24,557	13,357	5,537	5,663	420,028	19.3	4.5	1.3
Taiwan	32,229	6,987	3,204	2,823	960	166,662	19.3	2.5	1.7
Europe									
Germany	63,742	23,472	9,970	10,769	2,733	461,415	13.8	2.8	2.3
United Kingdom[d]	136,463	35,823	20,651	11,919	3,253	359,418	38.0	6.7	3.3
North America									
Canada	67,444	28,509	9,141	17,787	1,581	184,200	36.6	5.8	9.7
Mexico	91,888	24,228	8,168	8,507	7,553	1,017,000	9.0	1.5	0.8
United States	651,815	181,333	59,320	110,697	11,316	1,807,000	36.1	3.9	6.1

NOTES: Mexican and U.S. data are for 1996. All other countries are for 1997.

[a]Ratios given in the last three columns are the number of degrees per 100 of the 24-year-old population.

[b]Natural sciences include physical, earth, atmospheric, oceanographic, biological sciences, as well as agriculture, mathematics, and computer science degrees.

[c]Social sciences include psychology, sociology, and other social sciences. Japanese social science data also include business administration. Mexican social science data are estimated.

[d]U.K. data include former colleges and polytechnics.

SOURCES: **ASIA: Japan-** Ministry of Education, Science, and Culture (Monbusho), *Monbusho Survey of Education* (Tokyo: annual series); **South Korea-** Ministry of Education, *Statistical Yearbook of Education* (Seoul: 1998); **Taiwan-** Ministry of Education, *Educational Statistics of the Republic of China* (Taipei: 1998); **EUROPE: France-** Ministère de l'Éducation Nationale, *Repères et Références Statistiques sur les Enseignements et la Formation* (Vanves, France: 1996); **Germany-** Statistisches Bundesamt Wiesbaden, *Prüfungen an Hochschulen* (Wiesbaden: 1998); **United Kingdom-** Higher Education Statistics Agency, *Students in Higher Education Institutions: 1997/98* (Cheltenham: 1999); **NORTH AMERICA: Canada-** Association of Universities and Colleges, unpublished tabulations, 1998; **Mexico-** Asociación Nacional de Universidades e Instituciones de Educación Superior, *Anuario Estadístico 1997: Población Escolar de Licenciatura en Universidades e Institutos Tecnológicos* (1998); **United States-** National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Science and Engineering Degrees 1966- 97* (Arlington, VA: 1999).

See figure 4-29 in Volume 1.

Appendix table 4-37.
Percentage distribution of first university degrees and science and engineering degrees earned by males and females in selected countries and regions: 1997 or most recent year

Region/country	All first university degrees	S&E degrees	Degree fields				
			Natural sciences[a]	Math and computer science	Agriculture	Social sciences[b]	Engineering
			Male				
Asia	62.7	79.5	67.2	66.1	62.4	76.4	90.5
Japan	65.3	81.2	74.7	76.9	63.9	77.9	91.8
South Korea	58.8	74.5	57.4	59.9	61.1	66.8	86.3
Taiwan	54.4	75.0	74.4	72.4	55.7	43.5	92.6
Europe	50.5	64.0	53.6	70.6	48.1	53.9	85.0
Germany	53.6	66.9	59.6	66.4	47.0	61.2	84.8
United Kingdom[c]	47.3	59.9	47.9	73.0	48.9	42.5	85.6
North America	45.4	54.2	47.8	64.1	71.4	40.6	80.6
Canada	42.0	47.6	45.4	70.2	31.6	36.5	80.3
Mexico	51.9	66.3	49.9	55.9	75.6	49.7	77.9
United States	44.8	52.9	48.1	66.1	75.5	40.4	82.1
			Female				
Asia	37.3	20.5	32.8	33.9	37.6	23.6	9.5
Japan	34.7	18.8	25.3	23.1	36.1	22.1	8.2
South Korea	41.2	25.5	42.6	40.1	38.9	33.2	13.7
Taiwan	45.6	25.0	25.6	27.6	44.3	56.5	7.4
Europe	49.5	36.0	46.4	29.4	51.9	46.1	15.0
Germany	46.4	33.1	40.4	33.6	53.0	38.8	15.2
United Kingdom[c]	52.7	40.1	52.1	27.0	51.1	57.5	14.4
North America	54.6	45.8	52.2	35.9	28.6	59.4	19.4
Canada	58.0	52.4	54.6	29.8	68.4	63.5	19.7
Mexico	48.1	33.7	50.1	44.1	24.4	50.3	22.1
United States	55.2	47.1	51.9	33.9	24.5	59.6	17.9

NOTES: Mexico data are for 1996. All other countries are for 1997.

[a]Natural sciences here include physical, earth, atmospheric, oceanographic, and biological sciences.

[b]Social sciences include psychology, sociology, and other social sciences. Japanese social science data also include business administration. Mexican social science data are estimated.

[c]U.K. data include former colleges and polytechnics.

SOURCES: **ASIA: Japan-** Ministry of Education, Science, and Culture (Monbusho), *Monbusho Survey of Education* (Tokyo: annual series); **South Korea-** Ministry of Education, *Statistical Yearbook of Education* (Seoul: 1996); **Taiwan-** Ministry of Education, *Educational Statistics of the Republic of China* (Taipei: 1996); **EUROPE: Germany-** Statistisches Bundesamt Wiesbaden, *Prüfungen an Hochschulen* (Wiesbaden: 1998); **United Kingdom-** Higher Education Statistics Agency, *Students in Higher Education Institutions: 1995/96* (Cheltenham: 1997); **NORTH AMERICA: Canada-** Association of Universities and Colleges, unpublished tabulations, 1998; **Mexico-** Asociación Nacional de Universidades e Instituciones de Educación Superior, *Anuario Estadístico 1997: Posgrado* (1998); **United States-** National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Science and Engineering Degrees 1966-94*, NSF 96-321 (Arlington, VA: 1996).

See page 4-28 in Volume 1.

Appendix table 4-38.
Earned master's degrees, by field, race/ethnicity and citizenship: 1977–96 (selected years)

Field and race/ethnicity	1977	1979	1981	1985	1987	1989	1990	1991	1992	1993	1994	1995	1996
Total													
All degrees	318,241	302,075	296,798	287,213	290,532	311,050	324,947	338,498	354,207	370,973	389,008	399,428	408,932
Science and engineering	63,779	59,684	59,598	64,726	66,774	70,333	72,228	72,828	76,184	81,415	86,080	88,431	88,730
Natural sciences[a]	16,234	16,350	15,332	14,045	13,461	13,260	12,966	12,713	13,226	13,462	14,340	14,770	16,093
Math and computer sciences	6,496	6,101	6,787	9,989	11,808	12,829	13,327	12,956	13,549	14,251	14,529	14,522	14,260
Social sciences[b]	24,798	21,723	20,763	19,757	19,448	20,509	21,950	23,152	24,399	26,044	28,504	30,522	30,620
Engineering	16,251	15,510	16,716	20,935	22,057	23,735	23,985	24,007	25,010	27,658	28,707	28,617	27,757
Engineering technology	NA	NA	NA	816	883	1,135	1,188	1,555	1,547	1,577	1,547	1,577	1,651
Non-science and -engineering	254,462	242,391	237,200	222,487	223,758	240,717	252,719	265,670	278,023	289,558	302,928	310,997	320,202
U.S. citizen or permanent resident													
All degrees	300,334	281,811	273,184	254,401	246,939	278,927	290,345	300,887	314,555	326,864	342,502	350,672	360,682
Science and engineering	55,963	50,846	49,340	50,751	50,330	55,190	55,890	55,779	58,177	61,265	65,201	67,110	68,151
Natural sciences[a]	14,437	14,410	13,411	11,676	10,721	10,756	10,234	9,857	10,191	10,317	10,929	11,471	12,720
Math and computer sciences	5,760	5,099	5,342	7,385	8,179	9,411	9,729	9,078	9,268	9,334	9,522	9,486	9,308
Social sciences[b]	23,071	19,920	18,785	17,230	15,990	18,035	19,181	20,357	21,607	23,075	25,400	27,232	27,361
Engineering	12,695	11,417	11,802	14,460	15,440	16,988	16,746	16,487	17,111	18,539	19,350	18,921	18,762
Engineering technology	NA	NA	NA	596	712	909	959	1,175	1,256	1,268	1,152	1,168	1,249
Non-science and -engineering	244,371	230,965	223,844	203,650	196,609	223,737	234,455	245,108	256,378	265,599	277,301	283,562	292,531
White, all degrees	266,109	249,401	241,255	223,649	216,807	230,322	236,874	247,524	257,062	265,668	273,913	277,437	282,713
Science and engineering	50,420	45,748	43,967	43,982	43,360	43,945	44,450	44,513	45,649	47,975	50,711	51,417	51,791
Natural sciences[a]	13,405	13,282	12,411	10,559	9,623	9,262	8,722	8,300	8,393	8,504	8,859	9,242	10,332
Math and computer sciences	5,256	4,625	4,708	6,176	6,729	6,818	7,020	6,705	6,743	6,818	6,665	6,547	6,340
Social sciences[b]	20,315	17,759	16,701	15,061	14,171	15,033	15,849	16,873	17,761	18,733	20,718	21,807	21,546
Engineering	11,444	10,082	10,147	12,186	12,837	12,832	12,859	12,635	12,752	13,920	14,469	13,821	13,573
Engineering technology	NA	NA	NA	526	581	802	830	1,041	994	982	994	982	1,053
Non-science and -engineering	215,689	203,653	197,288	179,667	173,447	186,377	192,424	203,011	211,413	217,693	223,202	226,020	230,922
Asian/Pacific Islander, all degrees	5,145	5,519	6,304	7,805	8,129	10,174	9,994	11,070	12,293	13,169	14,559	15,906	17,281
Science and engineering	1,749	1,929	2,170	3,285	3,455	4,100	4,055	4,310	4,763	4,846	5,422	5,683	5,942
Natural sciences[a]	388	469	365	450	464	545	504	532	610	615	698	802	933
Math and computer sciences	198	253	376	779	962	1,072	1,125	1,203	1,306	1,303	1,461	1,478	1,472
Social sciences[b]	426	357	350	505	379	491	563	567	624	668	820	831	916
Engineering	737	850	1,079	1,551	1,650	1,992	1,863	2,008	2,223	2,260	2,443	2,572	2,621
Engineering technology	NA	NA	NA	25	46	40	60	40	46	55	46	55	61
Non-science and -engineering	3,396	3,590	4,134	4,520	4,674	6,074	5,939	6,760	7,530	8,323	9,137	10,223	11,339
Black, all degrees	21,041	19,422	17,152	13,960	13,173	13,455	14,473	15,857	17,420	18,897	20,936	22,954	24,588
Science and engineering	2,321	2,003	1,801	1,742	1,784	1,652	1,847	2,090	2,356	2,554	2,849	3,339	3,518
Natural sciences[a]	351	382	351	290	301	238	225	261	306	310	347	383	402
Math and computer sciences	200	136	137	233	280	257	302	383	393	406	474	498	530
Social sciences[b]	1,530	1,239	1,053	889	800	802	933	1,048	1,191	1,274	1,439	1,793	1,912
Engineering	240	246	260	330	403	355	387	398	466	564	589	665	674
Engineering technology	NA	NA	NA	37	42	55	47	61	72	85	72	85	81
Non-science and -engineering	18,720	17,419	15,351	12,218	11,389	11,803	12,626	13,767	15,064	16,343	18,087	19,615	21,070

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-38.
Earned master's degrees, by field, race/ethnicity and citizenship: 1977–96

Field	1977	1979	1981	1985	1987	1989	1990	1991	1992	1993	1994	1995	1996
Hispanic, all degrees	7,071	6,470	7,439	7,730	7,781	8,133	8,495	9,684	10,256	11,371	13,177	13,905	15,394
Science and engineering	1,325	1,001	1,237	1,514	1,584	1,585	1,587	1,736	1,806	2,092	2,514	2,585	2,730
Natural sciences[a]	245	227	251	332	310	266	262	281	288	334	436	392	413
Math and computer sciences	91	61	102	149	183	178	169	213	215	240	244	273	264
Social sciences[b]	738	498	599	687	579	673	710	774	815	937	1,115	1,209	1,305
Engineering	251	215	285	346	512	468	446	468	488	581	719	711	748
Engineering technology	NA	NA	NA	6	17	10	19	25	37	40	37	40	47
Non-science and -engineering	5,746	5,469	6,202	6,216	6,197	6,548	6,908	7,948	8,450	9,279	10,663	11,320	12,664
American Indian/Alaskan Native, all degrees	968	999	1,034	1,257	1,049	1,082	1,050	1,125	1,228	1,344	1,618	1,542	1,693
Science and engineering	148	165	165	228	147	209	181	200	198	253	273	299	304
Natural sciences[a]	48	50	33	45	23	41	31	34	37	46	44	52	41
Math and computer sciences	15	24	19	48	25	45	13	23	19	22	24	27	30
Social sciences[b]	62	67	82	88	61	90	102	103	100	135	145	177	177
Engineering	23	24	31	47	38	33	35	40	42	50	60	43	56
Engineering technology	NA	NA	NA	2	26	2	3	8	3	6	3	6	7
Non-science and -engineering	820	834	869	1,029	902	873	869	925	1,030	1,091	1,345	1,243	1,389
Foreign citizen													
All degrees	17,345	19,427	22,058	26,952	28,264	32,123	34,602	37,611	39,652	44,109	46,506	48,756	48,250
Science and engineering	7,805	8,544	9,749	12,506	13,045	15,143	16,338	17,049	18,007	20,150	20,879	21,321	20,579
Natural sciences[a]	1,797	1,895	1,864	2,178	2,132	2,504	2,732	2,856	3,035	3,145	3411	3299	3373
Math and computer sciences	736	937	1,368	2,394	2,903	3,418	3,598	3,878	4,281	4,917	5007	5036	4952
Social sciences[b]	1,727	1,752	1,954	2,240	2,229	2,474	2,769	2,795	2,792	2,969	3,104	3,290	3,259
Engineering	3,545	3,960	4,563	5,694	5,781	6,747	7,239	7,520	7,899	9,119	9,357	9,696	8,995
Engineering technology	NA	NA	NA	124	127	131	172	279	291	309	291	309	298
Non-science and -engineering	9,540	10,883	12,309	14,446	15,219	16,980	18,264	20,562	21,645	23,959	25,627	27,435	27,671

NA = not available

NOTES: Data by racial/ethnic group were collected on a biennial schedule until 1990 and annually thereafter. Data are not available for 1983. Data by racial/ethnic group are collected by broad fields of study only; therefore, these data cannot be adjusted to the exact field taxonomies used by the National Science Foundation.

[a]Natural sciences here include physical, earth, atmospheric, oceanographic, biological, and agricultural sciences.

[b]Social sciences include psychology, sociology, and other social sciences.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Science and Engineering Degrees, by Race/Ethnicity of Recipients:1989-96,* Early Release Tables, Web page <<http://www.nsf.gov/sbc/srs>>; and previous editions.

See figures 4-27, 4-30, and 4-34 in Volume 1.

Appendix table 4-39.
Earned doctoral degrees, by field, race/ethnicity, and citizenship: 1977–97 (selected years)

Field and race/ethnicity	1977	1979	1981	1983	1985	1987	1989	1991	1992	1993	1994	1995	1996	1997
Total[a]														
All degrees	31,716	31,239	31,356	31,281	31,297	32,370	34,327	37,534	38,890	39,801	41,034	41,743	42,415	42,705
Science and engineering	18,008	17,872	18,257	18,635	18,935	19,894	21,732	24,023	24,675	25,443	26,205	26,535	27,230	26,847
Natural sciences[b]	7,676	7,817	7,995	8,194	8,436	8,655	9,186	10,164	10,437	10,530	11,082	11,033	11,392	11,256
Math and computer sciences	964	979	960	987	998	1,190	1,471	1,839	1,927	2,026	2,021	2,187	2,043	2,001
Social sciences[c]	6,720	6,582	6,774	6,673	6,335	6,337	6,532	6,806	6,873	7,189	7,280	7,307	7,490	7,538
Engineering	2,648	2,494	2,528	2,781	3,166	3,712	4,543	5,214	5,438	5,698	5,822	6,008	6,305	6,052
Non-science and -engineering	13,708	13,367	13,099	12,646	12,362	12,476	12,595	13,511	14,215	14,358	14,829	15,208	15,185	15,858
U.S. citizen or permanent resident														
All degrees	27,487	26,784	26,341	25,634	24,694	24,562	25,027	27,430	27,990	28,708	30,894	32,059	31,506	30,601
Science and engineering	14,881	14,711	14,654	14,518	14,065	14,055	14,592	15,914	15,942	16,573	18,187	18,996	18,628	18,005
Natural sciences[b]	6,427	6,604	6,640	6,706	6,634	6,450	6,629	7,063	7,039	7,092	8,106	8,362	8,067	7,809
Math and computer sciences	769	778	713	664	631	671	824	969	996	1,099	1,200	1,387	1,159	1,122
Social sciences[c]	5,886	5,712	5,830	5,666	5,206	5,021	4,910	5,408	5,387	5,685	5,828	5,905	6,019	5,793
Engineering	1,799	1,617	1,471	1,482	1,594	1,913	2,229	2,474	2,520	2,697	3,053	3,342	3,383	3,281
Non-science and -engineering	12,606	12,073	11,687	11,116	10,629	10,507	10,435	11,516	12,048	12,135	12,707	13,063	12,878	12,596
White, all degrees	23,654	22,396	22,470	22,251	21,306	21,122	21,570	23,185	23,625	24,052	24,594	24,719	24,685	23,789
Science and engineering	12,875	12,314	12,573	12,671	12,169	12,052	12,501	13,323	13,326	13,737	13,889	13,902	13,999	13,623
Natural sciences[b]	5,598	5,620	5,771	5,981	5,903	5,663	5,800	6,111	6,019	5,950	6,123	5,978	5,952	5,866
Math and computer sciences	671	658	610	569	527	548	688	774	803	886	880	988	834	827
Social sciences[c]	5,177	4,879	5,099	4,993	4,551	4,383	4,287	4,601	4,624	4,876	4,866	4,846	4,953	4,668
Engineering	1,429	1,157	1,093	1,128	1,188	1,458	1,726	1,837	1,880	2,025	2,020	2,090	2,260	2,262
Non-science and -engineering	10,779	10,082	9,897	9,580	9,137	9,070	9,069	9,862	10,299	10,315	10,705	10,817	10,686	10,166
Asian/Pacific Islander, all degrees	910	1,102	1,073	1,042	1,070	1,168	1,268	1,531	1,764	2,017	3,546	4,309	3,697	3,140
Science and engineering	745	884	827	780	809	925	986	1,180	1,345	1,610	2,989	3,671	3,091	2,527
Natural sciences[b]	342	377	344	359	346	369	403	474	560	686	1,481	1,858	1,550	1,255
Math and computer sciences	42	55	56	54	50	67	76	123	138	156	259	345	251	205
Social sciences[c]	112	146	142	120	132	162	146	178	196	241	382	435	395	363
Engineering	249	306	285	247	281	327	361	405	451	527	867	1,033	895	704
Non-science and -engineering	165	218	246	262	261	243	282	351	419	407	557	638	606	613
Black, all degrees	1,191	1,112	1,110	1,005	1,043	910	963	1,166	1,116	1,280	1,279	1,477	1,457	1,476
Science and engineering	342	347	346	338	374	319	367	464	408	469	500	560	576	607
Natural sciences[b]	85	84	89	84	100	95	106	116	107	136	153	171	187	191
Math and computer sciences	9	12	11	6	10	13	9	19	9	14	21	16	20	11
Social sciences[c]	233	231	227	219	230	186	219	274	243	269	272	302	295	308
Engineering	15	20	19	29	34	25	33	55	49	50	54	71	74	97
Non-science and -engineering	849	765	764	667	669	591	596	702	708	811	779	917	881	869

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-39.
Earned doctoral degrees, by field, race/ethnicity, and citizenship: 1977–97 (selected years)

Field and race/ethnicity	1977	1979	1981	1983	1985	1987	1989	1991	1992	1993	1994	1995	1996	1997
Hispanic, all degrees	489	547	529	608	634	708	694	867	909	973	1,030	1,061	1,105	1,181
Science and engineering	203	234	240	284	296	357	382	492	513	542	548	571	623	645
Natural sciences[b]	76	84	93	86	107	138	157	191	208	226	254	234	229	251
Math and computer sciences	12	12	5	7	18	15	15	21	20	23	20	21	26	34
Social sciences[c]	91	114	126	162	149	170	163	220	214	227	208	239	270	265
Engineering	24	24	16	29	22	34	47	60	71	66	66	77	98	95
Non-science and -engineering	286	313	289	324	338	351	312	375	396	431	482	490	482	536
American Indian/Alaskan Native, all degrees	66	81	85	82	96	115	94	132	149	120	143	149	187	151
Science and engineering	31	29	28	30	41	53	53	56	69	43	64	69	96	71
Natural sciences[b]	14	6	8	13	21	20	25	27	26	17	24	26	34	24
Math and computer sciences	1	1	1	1	0	3	2	1	4	2	3	2	5	2
Social sciences[c]	15	19	15	15	19	23	19	22	28	22	31	31	43	33
Engineering	1	3	4	1	1	7	7	6	11	2	6	10	14	12
Non-science and -engineering	35	52	57	52	55	62	41	76	80	77	79	80	91	80
Temporary resident														
Total, all degrees	3,448	3,587	3,940	4,498	5,227	5,612	6,648	9,311	9,953	9,932	9,406	8,810	9,610	8,463
Science and engineering	2,675	2,689	2,983	3,412	4,047	4,468	5,391	7,641	8,092	8,113	7,521	6,994	7,802	6,948
Natural sciences[b]	1,079	1,046	1,140	1,273	1,517	1,704	1,975	2,936	3,213	3,191	2,815	2,501	3,026	2,786
Math and computer sciences	170	181	226	281	327	445	524	846	876	865	791	747	817	730
Social sciences[c]	651	645	675	688	784	787	952	1,226	1,260	1,273	1,262	1,222	1,243	1,036
Engineering	775	817	942	1,170	1,419	1,532	1,940	2,633	2,743	2,784	2,653	2,524	2,716	2,396
Non-science and -engineering	773	898	957	1,086	1,180	1,144	1,257	1,670	1,861	1,819	1,885	1,816	1,808	1,515
Citizenship unknown														
Total, all degrees	781	868	1,075	1,149	1,376	2,196	2,652	793	947	1,161	734	874	1,299	3,641
Science and engineering	452	472	620	705	823	1,371	1,749	468	641	757	497	545	800	1,894
Natural sciences[b]	170	167	215	215	285	501	582	165	185	247	161	170	299	661
Math and computer sciences	25	20	21	42	40	74	123	24	55	62	30	53	67	149
Social sciences[c]	183	225	269	319	345	529	670	172	226	231	190	180	228	709
Engineering	74	60	115	129	153	267	374	107	175	217	116	142	206	375
Non-science and -engineering	329	396	455	444	553	825	903	325	306	404	237	329	499	1,747

[a]Data include all doctorates awarded to U.S. citizens and permanent residents, temporary residents, and persons whose citizenship is unknown.

[b]Natural sciences here include physical, earth, atmospheric, oceanographic, biological, and agricultural sciences.

[c]Social sciences include psychology, sociology, and other social sciences.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Science and Engineering Degrees, by Race/Ethnicity of Recipients: 1989-96*, Early Release Tables; previous editions; and Selected Tables from *Science and Engineering Doctorate Awards: 1997*, Advanced Release.

See figures 4-27, 4-32, and 4-34 in Volume 1.

Appendix table 4-40.
Earned doctoral degrees in science and engineering in selected countries and regions, by sex and field: 1997 or most recent year

Region/country	All doctoral degrees	All S&E doctoral degrees	Degree fields: Natural sciences[a]	Math and computer science	Agriculture	Social sciences[b]	Engineering	Non S&E
Number								
Male								
Asia total	13,090	7,151	1,365	327	810	769	3,880	5,939
Japan[c]	8,206	4,489	888	144	617	514	2,326	3,717
South Korea	4,008	1,966	349	129	153	206	1,129	2,042
Taiwan	876	696	128	54	40	49	425	180
Europe total	30,388	19,991	9,642	1,777	634	2,837	5,101	10,397
France	6,743	5,825	2,573	670	101	1,038	1,443	918
Germany	16,404	9,132	4,758	651	336	1,286	2,101	7,272
United Kingdom	7,241	5,034	2,311	456	197	513	1,557	2,207
The Americas total	28,359	19,847	7,207	1,781	883	4,047	5,929	8,512
Canada	2,519	1,802	596	175	137	314	580	717
Mexico	457	249	76	9	35	85	44	208
United States	25,383	17,796	6,535	1,597	711	3,648	5,305	7,587
Female								
Asia total	2,822	835	205	79	165	206	180	1,987
Japan[c]	1,654	520	101	12	115	157	135	1,134
South Korea	991	231	81	58	25	32	35	760
Taiwan	177	84	23	9	25	17	10	93
Europe total	15,852	7,892	4,795	442	382	1,382	891	7,961
France	4,330	3,137	1,821	199	106	591	420	1,194
Germany	7,770	2,658	1,660	134	185	488	191	5,112
United Kingdom	3,752	2,097	1,314	109	91	303	280	1,655
The Americas total	18,994	9,579	3,709	435	348	4,272	815	9,415
Canada	1,395	656	172	29	80	317	58	739
Mexico	277	127	37	2	13	65	10	150
United States	17,322	8,796	3,500	404	255	3,890	747	8,526
Percent								
Male								
Asia total	82.3	89.5	86.9	80.5	83.1	78.9	95.6	74.9
Japan[c]	83.2	89.6	89.8	92.3	84.3	76.6	94.5	76.6
South Korea	80.2	89.5	81.2	69.0	86.0	86.6	97.0	72.9
Taiwan	83.2	89.2	84.8	85.7	61.5	74.2	97.7	65.9
Europe total	65.7	72.1	67.3	80.3	61.9	68.1	85.6	56.6
France	60.9	65.0	58.6	77.1	48.8	63.7	77.5	43.5
Germany	67.9	77.5	74.1	82.9	64.5	72.5	91.7	58.7
United Kingd/om	65.9	72.3	65.6	81.6	68.4	67.3	86.6	57.2
The Americas total	59.9	66.9	64.5	80.4	71.7	48.6	87.9	48.2
Canada	64.4	73.3	77.6	85.8	63.1	49.8	90.9	49.2
Mexico	62.3	66.2	67.3	81.8	72.9	56.7	81.5	58.1
United States	59.4	66.3	65.1	79.8	73.6	48.4	87.7	47.8

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-40.
Earned doctoral degrees in science and engineering in selected countries and regions, by sex and field: 1997 or most recent year

Region/country	All doctoral degrees	All S&E doctoral degrees	Degree fields					
			Natural sciences[a]	Math and computer science	Agriculture	Social sciences[b]	Engineering	Non S&E
				Female				
Asia total	17.7	10.5	13.1	19.5	16.9	21.1	4.4	25.1
Japan[c]	16.8	10.4	10.2	7.7	15.7	23.4	5.5	23.4
South Korea	19.8	10.5	18.8	31.0	14.0	13.4	3.0	27.1
Taiwan	16.8	10.8	15.2	14.3	38.5	25.8	2.3	34.1
Europe total	34.3	27.9	32.7	19.7	38.1	31.9	14.4	43.4
France	39.1	35.0	41.4	22.9	51.2	36.3	22.5	56.5
Germany	32.1	22.5	25.9	17.1	35.5	27.5	8.3	41.3
United Kingdom	34.1	27.7	34.4	18.4	31.6	32.7	13.4	42.8
The Americas total	40.1	33.1	35.5	19.6	28.3	51.4	12.1	51.8
Canada	35.6	26.7	22.4	14.2	36.9	50.2	9.1	50.8
Mexico	37.7	33.8	32.7	18.2	27.1	43.3	18.5	41.9
United States	40.6	33.7	34.9	20.2	26.4	51.6	12.3	52.2

NOTES: Data are compiled from numerous national and international sources, and degree fields may not be strictly comparable. Data for Canada, France, Germany, Japan, Taiwan, the United Kingdom, and the United States are for 1997. Data for Mexico are for 1996.

[a]Natural sciences here include physical, earth, atmospheric, oceanographic, and biological sciences.

[b]Social sciences include psychology, sociology, and other social sciences.

[c]Japanese social science data also include business administration.

SOURCES: **ASIA: Japan-** Ministry of Education, Science, and Culture (Monbusho), *Monbusho Survey of Education* (Tokyo: annual series); **South Korea-** Ministry of Education, *Statistical Yearbook of Education* (Seoul: 1998); **Taiwan-** Ministry of Education, *Educational Statistics of the Republic of China: 1998* (Taipei: 1998); **EUROPE: France-** Ministère de l'Éducation National, *Rapport sur les Études Doctorales* (Paris: 1998); **Germany-** Statistisches Bundesamt, *Prüfungen an Hochschulen* (Wiesbaden: 1998); **United Kingdom-** Higher Education Statistical Agency, *Students in Higher Education Institutions, 1997/98* (Cheltenham: 1999); **THE AMERICAS: Canada-** Association of Universities and Colleges of Canada, unpublished tabulations (1998); **Mexico-** Asociación Nacional de Universidades e Instituciones de Educación Superior, *Anuario Estadístico 1997 Posgrado* (1997); and **United States-** National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Science and Engineering Doctorate Awards: 1997*, NSF 99-323 (Arlington, VA: 1999).

See text table 4-9 in Volume 1.

Appendix table 4-41.
U.S. doctoral degrees in S&E fields earned by U.S. and foreign citizens: 1986–97

	U.S. citizens	Total foreign students	Asian foreign students[a]	Other foreign students
1986	13,022	6,415	2,139	4,276
1987	12,966	6,928	2,473	4,455
1988	13,369	7,564	2,762	4,802
1989	13,467	8,264	3,099	5,165
1990	14,166	8,701	4,315	4,386
1991	14,624	9,395	5,239	4,156
1992	14,558	10,115	5,725	4,390
1993	14,929	10,512	5,943	4,569
1994	15,162	11,040	6,549	4,491
1995	15,460	11,055	6,687	4,368
1996	15,621	11,609	6,852	4,757
1997	15,744	11,103	5,575	5,528
Cumulative:				
1986-97	173,088	112,701	57,358	55,343

[a]Includes China, Hong Kong, Japan, South Korea, Taiwan, Thailand, other East Asian countries, and India.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Science and Engineering Doctorate Awards: 1997*, NSF 99-323 (Arlington, VA: 1999).

See figure 4-33 in Volume 1.

Appendix table 4-42.
Foreign doctoral recipients from U.S. universities who plan to stay in the United States, by field and region/country of origin: 1990–97

Region /country of origin	1990					1991					1992					1993				
	Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%
All fields																				
East/South Asia	5,139	2,349	45.7	1,703	33.1	6,181	3,555	57.5	2,249	36.4	6,852	4,309	62.9	2,496	36.4	7,063	4,345	61.5	2,340	33.1
China	1,244	730	58.7	506	40.7	1,939	1,529	78.9	924	47.7	2,265	2,000	88.3	1,090	48.1	2,430	2,143	88.2	1,080	44.4
Taiwan	1,149	477	41.5	314	27.3	1,321	635	48.1	367	27.8	1,431	702	49.1	364	25.4	1,456	584	40.1	304	20.9
Japan	186	73	39.2	55	29.6	164	66	40.2	45	27.4	172	74	43.0	46	26.7	182	66	36.3	43	23.6
South Korea	1,259	367	29.2	272	21.6	1,396	454	32.5	285	20.4	1,474	464	31.5	272	18.5	1,409	462	32.8	236	16.7
India	881	586	66.5	470	53.3	924	689	74.6	518	56.1	1,072	880	82.1	609	56.8	1,139	920	80.8	577	50.7
Other	420	116	27.6	86	20.5	437	182	41.6	110	25.2	438	189	43.2	115	26.3	447	170	38.0	100	22.4
West Asia	1,167	465	39.8	293	25.1	1,101	505	45.9	258	23.4	1,237	647	52.3	316	25.5	1,188	593	49.9	265	22.3
Iran	290	156	53.8	89	30.7	256	174	68.0	81	31.6	232	171	73.7	73	31.5	239	171	71.5	67	28.0
Israel	118	47	39.8	38	32.2	120	53	44.2	34	28.3	120	62	51.7	37	30.8	126	65	51.6	37	29.4
Turkey	121	71	58.7	48	39.7	107	47	43.9	29	27.1	143	72	50.3	39	27.3	158	67	42.4	34	21.5
Other	638	191	29.9	118	18.5	618	231	37.4	114	18.4	742	342	46.1	167	22.5	665	290	43.6	127	19.1
Pacifica/Australasia	271	87	32.1	62	22.9	338	134	39.6	88	26.0	318	138	43.4	91	28.6	330	141	42.7	88	26.7
Australia	95	33	34.7	23	24.2	80	34	42.5	25	31.3	80	41	51.3	28	35.0	91	45	49.5	33	36.3
Indonesia	77	13	16.9	10	13.0	106	16	15.1	12	11.3	102	18	17.6	12	11.8	109	22	20.2	13	11.9
New Zealand	24	11	45.8	9	37.5	35	16	45.7	13	37.1	24	10	41.7	8	33.3	32	11	34.4	8	25.0
Other	75	30	40.0	20	26.7	117	68	58.1	38	32.5	112	69	61.6	43	38.4	98	63	64.3	34	34.7
Africa	743	239	32.2	139	18.7	698	275	39.4	126	18.1	717	332	46.3	164	22.9	678	328	48.4	131	19.3
Egypt	192	34	17.7	19	9.9	136	37	27.2	17	12.5	126	44	34.9	19	15.1	107	47	43.9	21	19.6
Nigeria	148	78	52.7	42	28.4	133	78	58.6	32	24.1	128	90	70.3	40	31.3	117	81	69.2	18	15.4
South Africa	49	19	38.8	12	24.5	51	18	35.3	14	27.5	63	27	42.9	18	28.6	58	26	44.8	18	31.0
Other Africa	354	108	30.5	66	18.6	378	142	37.6	63	16.7	400	171	42.8	87	21.8	396	174	43.9	74	18.7
Europe	1,097	540	49.2	411	37.5	1,329	740	55.7	534	40.2	1,335	812	60.8	545	40.8	1,485	861	58.0	564	38.0
Greece	137	67	48.9	50	36.5	185	96	51.9	66	35.7	168	94	56.0	58	34.5	199	116	58.3	78	39.2
United Kingdom	172	119	69.2	90	52.3	207	142	68.6	101	48.8	216	161	74.5	117	54.2	230	169	73.5	120	52.2
Germany	169	85	50.3	65	38.5	181	109	60.2	80	44.2	189	116	61.4	72	38.1	250	148	59.2	91	36.4
Italy	88	35	39.8	24	27.3	115	56	48.7	44	38.3	99	51	51.5	29	29.3	101	43	42.6	31	30.7
France	94	41	43.6	30	31.9	107	55	51.4	40	37.4	116	63	54.3	42	36.2	136	62	45.6	40	29.4
Spain	73	27	37.0	24	32.9	103	52	50.5	39	37.9	91	57	62.6	41	45.1	100	54	54.0	34	34.0
Other	364	166	45.6	128	35.2	431	230	53.4	164	38.1	456	270	59.2	186	40.8	469	269	57.4	170	36.2
North/South America	1,099	434	39.5	329	29.9	1,293	599	46.3	434	33.6	1,302	615	47.2	393	30.2	1,279	589	46.1	382	29.9
Canada	419	191	45.6	153	36.5	511	241	47.2	187	36.6	509	260	51.1	191	37.5	486	239	49.2	176	36.2
Mexico	130	47	36.2	32	24.6	156	71	45.5	51	32.7	149	49	32.9	27	18.1	162	66	40.7	35	21.6
Argentina	78	32	41.0	24	30.8	73	46	63.0	33	45.2	101	47	46.5	28	27.7	68	37	54.4	25	36.8
Brazil	129	22	17.1	18	14.0	149	49	32.9	33	22.1	163	46	28.2	22	13.5	181	44	24.3	26	14.4
Chile	56	23	41.1	15	26.8	70	25	35.7	20	28.6	65	35	53.8	25	38.5	64	30	46.9	17	26.6
Colombia	46	24	52.2	18	39.1	64	33	51.6	19	29.7	54	29	53.7	14	25.9	47	21	44.7	17	36.2
Peru	28	14	50.0	12	42.9	40	27	67.5	16	40.0	42	27	64.3	19	45.2	48	27	56.3	17	35.4
Other	213	81	38.0	57	26.8	230	107	46.5	75	32.6	219	122	55.7	67	30.6	223	125	56.1	69	30.9

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-42.
Foreign doctoral recipients from U.S. universities who plan to stay in the United States, by field and region/country of origin: 1990–97

Region /country of origin	1994					1995					1996					1997				
	Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%
All fields																				
East/South Asia	7,833	5,052	64.5	2,625	33.5	7,922	5,341	67.4	2,791	35.2	8,107	5,544	68.4	3,464	42.7	6,632	4,353	65.6	3,060	46.1
China	2,788	2,560	91.8	1,227	44.0	2,992	2,748	91.8	1,343	44.9	3,221	2,905	90.2	1,794	55.7	2,440	1,976	81.0	1,392	57.0
Taiwan	1,576	654	41.5	322	20.4	1,485	669	45.1	293	19.7	1,404	653	46.5	344	24.5	1,217	639	52.5	400	32.9
Japan	235	95	40.4	57	24.3	233	102	43.8	69	29.6	245	104	42.4	67	27.3	214	96	44.9	70	32.7
South Korea	1,475	522	35.4	267	18.1	1,306	466	35.7	244	18.7	1,260	441	35.0	270	21.4	1,074	387	36.0	273	25.4
India	1,289	1,049	81.4	662	51.4	1,425	1,179	82.7	746	52.4	1,500	1,264	84.3	882	58.8	1,382	1,131	81.8	839	60.7
Other	470	172	36.6	90	19.1	481	177	36.8	96	20.0	477	177	37.1	107	22.4	305	124	40.7	86	28.2
West Asia	1,200	580	48.3	269	22.4	1,171	628	53.6	312	26.6	1,067	569	53.3	319	29.9	803	402	50.1	270	33.6
Iran	193	129	66.8	42	21.8	196	155	79.1	65	33.2	161	130	80.7	64	39.8	114	76	66.7	54	47.4
Israel	143	71	49.7	42	29.4	114	55	48.2	36	31.6	119	66	55.5	48	40.3	73	39	53.4	32	43.8
Turkey	163	55	33.7	32	19.6	188	104	55.3	59	31.4	167	94	56.3	55	32.9	160	82	51.3	53	33.1
Other	701	325	46.4	153	21.8	673	314	46.7	152	22.6	620	279	45.0	152	24.5	456	205	45.0	131	28.7
Pacifica/Australasia	317	157	49.5	92	29.0	303	122	40.3	71	23.4	318	160	50.3	90	28.3	269	123	45.7	81	30.1
Australia	98	55	56.1	40	40.8	90	43	47.8	31	34.4	75	43	57.3	28	37.3	80	36	45.0	28	35.0
Indonesia	98	22	22.4	12	12.2	107	18	16.8	6	5.6	86	20	23.3	8	9.3	80	15	18.8	9	11.3
New Zealand	29	15	51.7	12	41.4	34	19	55.9	13	38.2	44	27	61.4	20	45.5	30	17	56.7	14	46.7
Other	92	65	70.7	28	30.4	72	42	58.3	21	29.2	113	70	61.9	34	30.1	79	55	69.6	30	38.0
Africa	784	384	49.0	136	17.3	622	329	52.9	109	17.5	629	312	49.6	142	22.6	441	218	49.4	138	31.3
Egypt	124	56	45.2	24	19.4	91	36	39.6	10	11.0	107	51	47.7	30	28.0	75	35	46.7	25	33.3
Nigeria	114	95	83.3	30	26.3	99	84	84.8	23	23.2	79	54	68.4	20	25.3	42	27	64.3	14	33.3
South Africa	56	26	46.4	17	30.4	60	23	38.3	12	20.0	70	29	41.4	22	31.4	33	10	30.3	9	27.3
Other Africa	490	207	42.2	65	13.3	372	186	50.0	64	17.2	373	178	47.7	70	18.8	291	146	50.2	90	30.9
Europe	1,565	938	59.9	620	39.6	1,702	1,071	62.9	684	40.2	1,720	1,120	65.1	768	44.7	1,646	1,075	65.3	819	49.8
Greece	188	85	45.2	60	31.9	197	111	56.3	60	30.5	152	85	55.9	57	37.5	117	73	62.4	60	51.3
United Kingdom	219	156	71.2	97	44.3	222	167	75.2	116	52.3	206	154	74.8	107	51.9	164	125	76.2	96	58.5
Germany	257	167	65.0	113	44.0	306	194	63.4	120	39.2	246	150	61.0	102	41.5	246	145	58.9	109	44.3
Italy	108	57	52.8	30	27.8	116	60	51.7	33	28.4	102	48	47.1	31	30.4	111	58	52.3	43	38.7
France	132	77	58.3	45	34.1	117	65	55.6	36	30.8	102	58	56.9	38	37.3	109	57	52.3	39	35.8
Spain	113	59	52.2	43	38.1	102	64	62.7	50	49.0	120	84	70.0	58	48.3	86	46	53.5	37	43.0
Other	548	337	61.5	232	42.3	642	410	63.9	269	41.9	792	541	68.3	375	47.3	943	672	71.3	514	54.5
North/South America	1,368	641	46.9	405	29.6	1,326	620	46.8	384	29.0	1,426	672	47.1	450	31.6	1,167	575	49.3	439	37.6
Canada	490	239	48.8	174	35.5	524	278	53.1	171	32.6	505	269	53.3	190	37.6	415	239	57.6	197	47.5
Mexico	178	67	37.6	37	20.8	162	57	35.2	34	21.0	180	72	40.0	41	22.8	162	68	42.0	45	27.8
Argentina	68	45	66.2	33	48.5	77	38	49.4	26	33.8	91	60	65.9	39	42.9	91	56	61.5	45	49.5
Brazil	202	60	29.7	33	16.3	175	48	27.4	32	18.3	262	66	25.2	46	17.6	160	42	26.3	32	20.0
Chile	54	19	35.2	14	25.9	50	20	40.0	11	22.0	42	14	33.3	10	23.8	35	17	48.6	10	28.6
Colombia	59	35	59.3	14	23.7	56	24	42.9	15	26.8	54	27	50.0	18	33.3	52	26	50.0	23	44.2
Peru	42	30	71.4	16	38.1	39	23	59.0	14	35.9	45	31	68.9	21	46.7	35	25	71.4	17	48.6
Other	275	146	53.1	84	30.5	243	132	54.3	81	33.3	247	133	53.8	85	34.4	217	102	47.0	70	32.3

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-42.
Foreign doctoral recipients from U.S. universities who plan to stay in the United States, by field and region/country of origin: 1990–97

Region /country of origin	1990					1991					1992					1993				
	Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%
Science & engineering																				
East/South Asia	4,305	2,074	48.2	1,497	34.8	5,224	3,155	60.4	1,980	37.9	5,717	3,732	65.3	2,144	37.5	5,935	3,836	64.6	2,057	34.7
China	1,166	692	59.3	482	41.3	1,809	1,434	79.3	865	47.8	2,068	1,825	88.2	997	48.2	2,240	1,984	88.6	1,011	45.1
Taiwan	1,012	451	44.6	299	29.5	1,123	581	51.7	340	30.3	1,240	640	51.6	329	26.5	1,213	530	43.7	282	23.2
Japan	147	60	40.8	48	32.7	125	50	40.0	35	28.0	132	51	38.6	28	21.2	132	43	32.6	27	20.5
South Korea	971	307	31.6	226	23.3	1,107	390	35.2	243	22.0	1,123	373	33.2	220	19.6	1,118	394	35.2	201	18.0
India	709	467	65.9	371	52.3	752	554	73.7	408	54.3	860	703	81.7	485	56.4	932	759	81.4	462	49.6
Other	300	97	32.3	71	23.7	308	146	47.4	89	28.9	294	140	47.6	85	28.9	300	126	42.0	74	24.7
West Asia	938	407	43.4	257	27.4	911	439	48.2	225	24.7	1,019	554	54.4	267	26.2	966	504	52.2	220	22.8
Iran	258	139	53.9	80	31.0	227	154	67.8	72	31.7	199	147	73.9	64	32.2	203	142	70.0	55	27.1
Israel	79	33	41.8	27	34.2	89	41	46.1	26	29.2	87	46	52.9	28	32.2	89	48	53.9	28	31.5
Turkey	106	66	62.3	43	40.6	100	42	42.0	26	26.0	132	66	50.0	36	27.3	136	60	44.1	29	21.3
Other	495	169	34.1	107	21.6	495	202	40.8	101	20.4	601	295	49.1	139	23.1	538	254	47.2	108	20.1
Pacifica/Australasia	173	64	37.0	45	26.0	213	94	44.1	62	29.1	220	100	45.5	68	30.9	227	111	48.9	70	30.8
Australia	45	21	46.7	15	33.3	35	16	45.7	12	34.3	40	22	55.0	16	40.0	47	32	68.1	23	48.9
Indonesia	53	12	22.6	9	17.0	66	13	19.7	11	16.7	78	16	20.5	11	14.1	78	18	23.1	12	15.4
New Zealand	16	7	43.8	6	37.5	23	11	47.8	8	34.8	16	6	37.5	5	31.3	24	8	33.3	6	25.0
Other	59	24	40.7	15	25.4	89	54	60.7	31	34.8	86	56	65.1	36	41.9	78	53	67.9	29	37.2
Africa	536	161	30.0	95	17.7	500	200	40.0	88	17.6	507	229	45.2	110	21.7	470	224	47.7	89	18.9
Egypt	159	28	17.6	14	8.8	112	30	26.8	13	11.6	101	32	31.7	16	15.8	88	38	43.2	16	18.2
Nigeria	82	41	50.0	24	29.3	83	49	59.0	21	25.3	67	53	79.1	23	34.3	54	40	74.1	9	16.7
South Africa	31	14	45.2	9	29.0	30	12	40.0	9	30.0	39	16	41.0	12	30.8	36	14	38.9	8	22.2
Other Africa	264	78	29.5	48	18.2	275	109	39.6	45	16.4	300	128	42.7	59	19.7	292	132	45.2	56	19.2
Europe	802	383	47.8	288	35.9	971	524	54.0	385	39.6	950	550	57.9	377	39.7	1,103	611	55.4	415	37.6
Greece	125	65	52.0	48	38.4	168	90	53.6	62	36.9	149	82	55.0	49	32.9	174	101	58.0	68	39.1
United Kingdom	104	73	70.2	53	51.0	134	91	67.9	66	49.3	139	101	72.7	75	54.0	157	113	72.0	86	54.8
Germany	123	59	48.0	46	37.4	118	67	56.8	51	43.2	124	67	54.0	44	35.5	164	86	52.4	55	33.5
Italy	63	23	36.5	15	23.8	86	37	43.0	30	34.9	73	37	50.7	25	34.2	76	30	39.5	23	30.3
France	65	25	38.5	16	24.6	67	28	41.8	21	31.3	77	31	40.3	20	26.0	93	29	31.2	17	18.3
Spain	40	11	27.5	11	27.5	59	26	44.1	19	32.2	45	27	60.0	20	44.4	63	27	42.9	21	33.3
Other	282	127	45.0	99	35.1	339	185	54.6	136	40.1	343	205	59.8	144	42.0	376	225	59.8	145	38.6
North/South America	786	312	39.7	236	30.0	909	438	48.2	328	36.1	909	435	47.9	277	30.5	900	415	46.1	282	31.3
Canada	252	121	48.0	99	39.3	296	162	54.7	127	42.9	304	171	56.3	132	43.4	285	164	57.5	131	46.0
Mexico	104	34	32.7	21	20.2	128	58	45.3	45	35.2	115	39	33.9	22	19.1	139	54	38.8	30	21.6
Argentina	65	28	43.1	22	33.8	62	39	62.9	29	46.8	86	39	45.3	22	25.6	53	26	49.1	17	32.1
Brazil	98	17	17.3	13	13.3	118	35	29.7	25	21.2	133	37	27.8	18	13.5	151	34	22.5	19	12.6
Chile	50	18	36.0	12	24.0	54	21	38.9	17	31.5	48	25	52.1	18	37.5	52	24	46.2	15	28.8
Colombia	40	21	52.5	16	40.0	49	24	49.0	13	26.5	37	20	54.1	9	24.3	35	11	31.4	10	28.6
Peru	22	10	45.5	8	36.4	35	23	65.7	15	42.9	31	22	71.0	15	48.4	34	21	61.8	12	35.3
Other	155	63	40.6	45	29.0	167	76	45.5	57	34.1	155	82	52.9	41	26.5	151	81	53.6	48	31.8

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-42.
Foreign doctoral recipients from U.S. universities who plan to stay in the United States, by field and region/country of origin: 1990–97

Region /country of origin	1994 Total Ph.D. recipients	1994 Plan to stay in U.S. No.	1994 Plan to stay in U.S. %	1994 Firm plans to stay in U.S. No.	1994 Firm plans to stay in U.S. %	1995 Total Ph.D. recipients	1995 Plan to stay in U.S. No.	1995 Plan to stay in U.S. %	1995 Firm plans to stay in U.S. No.	1995 Firm plans to stay in U.S. %	1996 Total Ph.D. recipients	1996 Plan to stay in U.S. No.	1996 Plan to stay in U.S. %	1996 Firm plans to stay in U.S. No.	1996 Firm plans to stay in U.S. %	1997 Total Ph.D. recipients	1997 Plan to stay in U.S. No.	1997 Plan to stay in U.S. %	1997 Firm plans to stay in U.S. No.	1997 Firm plans to stay in U.S. %
Science & engineering																				
East/South Asia	6,532	4,458	68.2	2,328	35.6	6,688	4,756	71.1	2,485	37.2	6,879	4,960	72.1	3,130	45.5	5,618	3,891	69.3	2,754	49.0
China	2,540	2,351	92.6	1,143	45.0	2,763	2,548	92.2	1,247	45.1	2,970	2,697	90.8	1,689	56.9	2,251	1,843	81.9	1,301	57.8
Taiwan	1,297	593	45.7	296	22.8	1,240	615	49.6	275	22.2	1,153	596	51.7	320	27.8	1,000	576	57.6	366	36.6
Japan	182	79	43.4	51	28.0	155	63	40.6	48	31.0	165	71	43.0	44	26.7	146	62	42.5	48	32.9
South Korea	1,143	436	38.1	230	20.1	1,000	388	38.8	210	21.0	977	368	37.7	237	24.3	813	332	40.8	244	30.0
India	1,065	871	81.8	536	50.3	1,206	1,003	83.2	632	52.4	1,276	1,084	85.0	753	59.0	1,173	968	82.5	714	60.9
Other	305	128	42.0	72	23.6	324	139	42.9	73	22.5	338	144	42.6	87	25.7	235	110	46.8	81	34.5
West Asia	1,004	501	49.9	235	23.4	966	549	56.8	272	28.2	883	509	57.6	284	32.2	655	361	55.1	243	37.1
Iran	173	114	65.9	37	21.4	173	138	79.8	58	33.5	149	119	79.9	58	38.9	106	72	67.9	52	49.1
Israel	106	60	56.6	38	35.8	80	38	47.5	23	28.8	80	51	63.8	39	48.8	49	33	67.3	28	57.1
Turkey	144	48	33.3	27	18.8	166	96	57.8	57	34.3	148	88	59.5	52	35.1	141	78	55.3	50	35.5
Other	581	279	48.0	133	22.9	547	277	50.6	134	24.5	506	251	49.6	135	26.7	359	178	49.6	113	31.5
Pacifica/Australasia	230	117	50.9	69	30.0	231	97	42.0	53	22.9	236	121	51.3	66	28.0	191	89	46.6	63	33.0
Australia	56	33	58.9	26	46.4	61	29	47.5	19	31.1	43	26	60.5	17	39.5	47	22	46.8	22	46.8
Indonesia	83	20	24.1	12	14.5	83	18	21.7	6	7.2	69	18	26.1	8	11.6	60	12	20.0	7	11.7
New Zealand	15	9	60.0	7	46.7	26	15	57.7	11	42.3	32	20	62.5	15	46.9	21	13	61.9	11	52.4
Other	76	55	72.4	24	31.6	61	35	57.4	17	27.9	92	57	62.0	26	28.3	63	42	66.7	23	36.5
Africa	581	271	46.6	96	16.5	422	225	53.3	76	18.0	446	217	48.7	101	22.6	323	163	50.5	111	34.4
Egypt	104	47	45.2	20	19.2	78	32	41.0	9	11.5	89	43	48.3	26	29.2	68	32	47.1	22	32.4
Nigeria	60	51	85.0	15	25.0	52	48	92.3	12	23.1	40	27	67.5	9	22.5	21	15	71.4	9	42.9
South Africa	42	21	50.0	13	31.0	28	12	42.9	9	32.1	46	22	47.8	16	34.8	23	8	34.8	7	30.4
Other Africa	375	152	40.5	48	12.8	264	133	50.4	46	17.4	271	125	46.1	50	18.5	211	108	51.2	73	34.6
Europe	1,148	668	58.2	466	40.6	1,253	776	61.9	513	40.9	1,265	807	63.8	568	44.9	1,255	825	65.7	640	51.0
Greece	166	75	45.2	54	32.5	174	98	56.3	57	32.8	133	76	57.1	51	38.3	97	64	66.0	54	55.7
United Kingdom	131	90	68.7	59	45.0	134	102	76.1	77	57.5	119	86	72.3	61	51.3	91	65	71.4	50	54.9
Germany	196	124	63.3	93	47.4	208	124	59.6	83	39.9	171	103	60.2	75	43.9	177	101	57.1	77	43.5
Italy	83	42	50.6	21	25.3	81	37	45.7	22	27.2	77	34	44.2	22	28.6	84	42	50.0	32	38.1
France	96	51	53.1	30	31.3	83	38	45.8	23	27.7	69	31	44.9	22	31.9	74	37	50.0	22	29.7
Spain	58	23	39.7	20	34.5	51	29	56.9	24	47.1	66	41	62.1	28	42.4	51	23	45.1	17	33.3
Other	418	263	62.9	189	45.2	522	348	66.7	227	43.5	630	436	69.2	309	49.0	754	545	72.3	430	57.0
North/South America	955	462	48.4	302	31.6	862	417	48.4	276	32.0	989	484	48.9	322	32.6	828	407	49.2	312	37.7
Canada	275	160	58.2	123	44.7	273	173	63.4	119	43.6	277	182	65.7	130	46.9	246	159	64.6	135	54.9
Mexico	142	49	34.5	29	20.4	128	45	35.2	26	20.3	158	59	37.3	32	20.3	130	50	38.5	35	26.9
Argentina	56	37	66.1	28	50.0	49	22	44.9	17	34.7	67	43	64.2	27	40.3	67	41	61.2	32	47.8
Brazil	157	45	28.7	26	16.6	137	39	28.5	28	20.4	207	53	25.6	37	17.9	135	34	25.2	26	19.3
Chile	42	14	33.3	11	26.2	38	14	36.8	7	18.4	36	12	33.3	8	22.2	28	12	42.9	7	25.0
Colombia	48	28	58.3	9	18.8	45	15	33.3	10	22.2	42	20	47.6	13	31.0	39	20	51.3	18	46.2
Peru	32	20	62.5	12	37.5	26	16	61.5	10	38.5	30	21	70.0	14	46.7	27	19	70.4	12	44.4
Other	203	109	53.7	64	31.5	166	93	56.0	59	35.5	172	94	54.7	61	35.5	156	72	46.2	47	30.1

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-42.
Foreign doctoral recipients from U.S. universities who plan to stay in the United States, by field and region/country of origin: 1990–97

Region /country of origin	1990					1991					1992					1993				
	Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%
Natural sciences																				
East/South Asia	2,173	1,162	53.5	885	40.7	2,589	1,765	68.2	1,182	45.7	2,923	2,174	74.4	1,354	46.3	3,006	2,215	73.7	1,297	43.1
China	770	475	61.7	358	46.5	1,238	1,003	81.0	656	53.0	1,438	1,282	89.2	767	53.3	1,516	1,354	89.3	753	49.7
Taiwan	458	221	48.3	153	33.4	421	247	58.7	152	36.1	504	291	57.7	175	34.7	514	270	52.5	164	31.9
Japan	58	31	53.4	25	43.1	46	25	54.3	17	37.0	50	26	52.0	17	34.0	48	17	35.4	15	31.3
South Korea	407	168	41.3	134	32.9	422	187	44.3	132	31.3	418	192	45.9	127	30.4	402	195	48.5	125	31.1
India	319	220	69.0	180	56.4	304	225	74.0	174	57.2	365	307	84.1	220	60.3	382	315	82.5	200	52.4
Other	161	47	29.2	35	21.7	158	78	49.4	51	32.3	148	76	51.4	48	32.4	144	64	44.4	40	27.8
West Asia	350	141	40.3	93	26.6	328	171	52.1	100	30.5	378	213	56.3	115	30.4	369	206	55.8	100	27.1
Iran	84	48	57.1	31	36.9	83	58	69.9	33	39.8	59	45	76.3	21	35.6	82	59	72.0	24	29.3
Israel	35	15	42.9	13	37.1	33	22	66.7	16	48.5	32	18	56.3	15	46.9	43	26	60.5	16	37.2
Turkey	28	16	57.1	9	32.1	24	9	37.5	6	25.0	35	22	62.9	13	37.1	33	15	45.5	8	24.2
Other	203	62	30.5	40	19.7	188	82	43.6	45	23.9	252	128	50.8	66	26.2	211	106	50.2	52	24.6
Pacifica/Australasia	94	34	36.2	23	24.5	100	54	54.0	39	39.0	120	63	52.5	42	35.0	122	60	49.2	38	31.1
Australia	19	8	42.1	5	26.3	15	9	60.0	7	46.7	16	8	50.0	5	31.3	24	15	62.5	10	41.7
Indonesia	23	5	21.7	3	13.0	23	4	17.4	4	17.4	35	6	17.1	4	11.4	34	4	11.8	3	8.8
New Zealand	10	5	50.0	5	50.0	11	4	36.4	3	27.3	7	3	42.9	3	42.9	17	6	35.3	5	29.4
Other	42	16	38.1	10	23.8	51	37	72.5	25	49.0	62	46	74.2	30	48.4	47	35	74.5	20	42.6
Africa	218	62	28.4	33	15.1	218	85	39.0	36	16.5	247	107	43.3	52	21.1	224	106	47.3	47	21.0
Egypt	62	11	17.7	5	8.1	42	12	28.6	5	11.9	44	16	36.4	8	18.2	30	16	53.3	7	23.3
Nigeria	26	13	50.0	6	23.1	31	20	64.5	9	29.0	22	20	90.9	11	50.0	18	13	72.2	3	16.7
South Africa	6	1	16.7	0	0.0	10	5	50.0	5	50.0	19	8	42.1	7	36.8	18	8	44.4	5	27.8
Other Africa	124	37	29.8	22	17.7	135	48	35.6	17	12.6	162	63	38.9	26	16.0	158	69	43.7	32	20.3
Europe	422	203	48.1	159	37.7	542	301	55.5	227	41.9	510	294	57.6	207	40.6	612	343	56.0	241	39.4
Greece	50	27	54.0	22	44.0	69	42	60.9	32	46.4	66	36	54.5	24	36.4	77	46	59.7	30	39.0
United Kingdom	54	40	74.1	31	57.4	75	54	72.0	45	60.0	70	48	68.6	37	52.9	95	69	72.6	55	57.9
Germany	76	35	46.1	25	32.9	82	45	54.9	37	45.1	78	42	53.8	30	38.5	100	49	49.0	32	32.0
Italy	34	11	32.4	9	26.5	45	23	51.1	17	37.8	43	19	44.2	13	30.2	44	16	36.4	13	29.5
France	27	9	33.3	5	18.5	37	16	43.2	9	24.3	40	16	40.0	11	27.5	49	15	30.6	11	22.4
Spain	18	4	22.2	4	22.2	37	15	40.5	9	24.3	16	12	75.0	8	50.0	30	20	66.7	15	50.0
Other	163	77	47.2	63	38.7	197	106	53.8	78	39.6	197	121	61.4	84	42.6	217	128	59.0	85	39.2
North/South America	419	157	37.5	118	28.2	514	245	47.7	189	36.8	503	232	46.1	153	30.4	470	225	47.9	165	35.1
Canada	130	61	46.9	49	37.7	154	93	60.4	76	49.4	163	91	55.8	72	44.2	140	87	62.1	73	52.1
Mexico	65	19	29.2	12	18.5	80	35	43.8	26	32.5	69	25	36.2	16	23.2	84	31	36.9	19	22.6
Argentina	42	17	40.5	13	31.0	34	21	61.8	18	52.9	45	18	40.0	12	26.7	31	16	51.6	13	41.9
Brazil	44	10	22.7	8	18.2	66	14	21.2	11	16.7	79	19	24.1	9	11.4	75	16	21.3	10	13.3
Chile	22	9	40.9	6	27.3	33	16	48.5	12	36.4	24	18	75.0	13	54.2	34	17	50.0	12	35.3
Colombia	27	12	44.4	10	37.0	26	10	38.5	6	23.1	22	10	45.5	3	13.6	21	6	28.6	5	23.8
Peru	11	4	36.4	4	36.4	18	9	50.0	6	33.3	12	8	66.7	6	50.0	12	8	66.7	7	58.3
Other	78	25	32.1	16	20.5	103	47	45.6	34	33.0	89	43	48.3	22	24.7	73	44	60.3	26	35.6

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-42.
Foreign doctoral recipients from U.S. universities who plan to stay in the United States, by field and region/country of origin: 1990–97

Region /country of origin	1994					1995					1996					1997				
	Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%
Natural sciences																				
East/South Asia	3,342	2,560	76.6	1,466	43.9	3,427	2,702	78.8	1,517	44.3	3,585	2,832	79.0	1,847	51.5	2,921	2,224	76.1	1,620	55.5
China	1,671	1,558	93.2	836	50.0	1,807	1,672	92.5	883	48.9	1,969	1,813	92.1	1,164	59.1	1,486	1,237	83.2	895	60.2
Taiwan	509	266	52.3	154	30.3	502	290	57.8	140	27.9	462	259	56.1	155	33.5	463	307	66.3	219	47.3
Japan	59	34	57.6	23	39.0	51	25	49.0	19	37.3	54	28	51.9	21	38.9	37	26	70.3	20	54.1
South Korea	473	242	51.2	152	32.1	414	220	53.1	147	35.5	430	208	48.4	146	34.0	328	181	55.2	145	44.2
India	474	389	82.1	251	53.0	499	417	83.6	281	56.3	520	454	87.3	316	60.8	484	403	83.3	287	59.3
Other	156	71	45.5	50	32.1	154	78	50.6	47	30.5	150	70	46.7	45	30.0	123	70	56.9	54	43.9
West Asia	395	205	51.9	112	28.4	411	227	55.2	124	30.2	365	216	59.2	126	34.5	237	140	59.1	100	42.2
Iran	60	39	65.0	16	26.7	73	58	79.5	24	32.9	68	55	80.9	29	42.6	41	30	73.2	21	51.2
Israel	52	36	69.2	25	48.1	36	19	52.8	15	41.7	41	32	78.0	25	61.0	20	17	85.0	16	80.0
Turkey	63	23	36.5	15	23.8	64	40	62.5	24	37.5	48	26	54.2	16	33.3	33	14	42.4	8	24.2
Other	220	107	48.6	56	25.5	238	110	46.2	61	25.6	208	103	49.5	56	26.9	143	79	55.2	55	38.5
Pacifica/Australasia	123	75	61.0	45	36.6	107	52	48.6	31	29.0	138	82	59.4	45	32.6	95	49	51.6	36	37.9
Australia	31	20	64.5	16	51.6	33	17	51.5	11	33.3	27	15	55.6	10	37.0	24	13	54.2	13	54.2
Indonesia	33	9	27.3	6	18.2	25	6	24.0	3	12.0	39	16	41.0	7	17.9	20	4	20.0	2	10.0
New Zealand	9	6	66.7	5	55.6	13	6	46.2	5	38.5	21	16	76.2	13	61.9	10	6	60.0	5	50.0
Other	50	40	80.0	18	36.0	36	23	63.9	12	33.3	51	35	68.6	15	29.4	41	26	63.4	16	39.0
Africa	267	119	44.6	51	19.1	187	106	56.7	36	19.3	185	88	47.6	39	21.1	153	76	49.7	46	30.1
Egypt	32	13	40.6	5	15.6	21	12	57.1	2	9.5	19	8	42.1	4	21.1	20	12	60.0	8	40.0
Nigeria	27	26	96.3	11	40.7	16	16	100.0	5	31.3	11	6	54.5	3	27.3	8	5	62.5	2	25.0
South Africa	20	13	65.0	9	45.0	11	7	63.6	5	45.5	21	8	38.1	7	33.3	8	1	12.5	1	12.5
Other Africa	188	67	35.6	26	13.8	139	71	51.1	24	17.3	134	66	49.3	25	18.7	117	58	49.6	35	29.9
Europe	661	392	59.3	288	43.6	707	425	60.1	299	42.3	751	502	66.8	358	47.7	796	533	67.0	414	52.0
Greece	84	36	42.9	26	31.0	87	43	49.4	30	34.5	64	34	53.1	20	31.3	49	32	65.3	29	59.2
United Kingdom	74	51	68.9	37	50.0	68	51	75.0	39	57.4	59	44	74.6	32	54.2	52	38	73.1	29	55.8
Germany	115	69	60.0	53	46.1	129	72	55.8	51	39.5	114	70	61.4	52	45.6	116	64	55.2	48	41.4
Italy	41	18	43.9	9	22.0	49	20	40.8	13	26.5	39	21	53.8	15	38.5	47	22	46.8	18	38.3
France	53	28	52.8	19	35.8	47	21	44.7	16	34.0	32	12	37.5	8	25.0	45	27	60.0	15	33.3
Spain	35	15	42.9	13	37.1	33	19	57.6	16	48.5	37	25	67.6	19	51.4	26	12	46.2	7	26.9
Other	259	175	67.6	131	50.6	294	199	67.7	134	45.6	406	296	72.9	212	52.2	501	368	73.5	292	58.3
North/South America	515	265	51.5	184	35.7	483	246	50.9	166	34.4	521	258	49.5	176	33.8	448	221	49.3	175	39.1
Canada	153	99	64.7	75	49.0	130	91	70.0	65	50.0	145	96	66.2	73	50.3	128	92	71.9	81	63.3
Mexico	84	30	35.7	21	25.0	86	31	36.0	17	19.8	94	34	36.2	17	18.1	71	27	38.0	19	26.8
Argentina	35	21	60.0	16	45.7	29	11	37.9	7	24.1	45	31	68.9	21	46.7	34	19	55.9	17	50.0
Brazil	82	26	31.7	15	18.3	77	27	35.1	22	28.6	108	23	21.3	16	14.8	77	17	22.1	14	18.2
Chile	23	9	39.1	7	30.4	23	12	52.2	6	26.1	19	9	47.4	7	36.8	18	7	38.9	4	22.2
Colombia	28	15	53.6	6	21.4	21	10	47.6	6	28.6	20	11	55.0	8	40.0	29	15	51.7	13	44.8
Peru	10	7	70.0	5	50.0	12	8	66.7	6	50.0	11	6	54.5	4	36.4	7	5	71.4	4	57.1
Other	100	58	58.0	39	39.0	105	56	53.3	37	35.2	79	48	60.8	30	38.0	84	39	46.4	23	27.4

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-42.
Foreign doctoral recipients from U.S. universities who plan to stay in the United States, by field and region/country of origin: 1990–97

Region /country of origin	1990					1991					1992					1993				
	Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%
Social sciences																				
East/South Asia	552	166	30.1	117	21.2	649	254	39.1	156	24.0	688	269	39.1	146	21.2	748	318	42.5	162	21.7
China	63	36	57.1	24	38.1	88	63	71.6	31	35.2	114	95	83.3	45	39.5	179	141	78.8	61	34.1
Taiwan	78	22	28.2	12	15.4	105	40	38.1	25	23.8	99	29	29.3	11	11.1	107	25	23.4	13	12.1
Japan	72	24	33.3	19	26.4	50	18	36.0	12	24.0	57	19	33.3	8	14.0	61	20	32.8	11	18.0
South Korea	204	36	17.6	26	12.7	251	55	21.9	33	13.1	268	50	18.7	28	10.4	232	38	16.4	13	5.6
India	76	36	47.4	29	38.2	91	57	62.6	43	47.3	90	61	67.8	43	47.8	102	76	74.5	53	52.0
Other	59	12	20.3	7	11.9	64	21	32.8	12	18.8	60	15	25.0	11	18.3	67	18	26.9	11	16.4
West Asia	162	57	35.2	42	25.9	172	58	33.7	26	15.1	183	79	43.2	35	19.1	156	71	45.5	32	20.5
Iran	35	16	45.7	9	25.7	21	16	76.2	5	23.8	30	19	63.3	6	20.0	26	18	69.2	5	19.2
Israel	22	8	36.4	7	31.8	29	12	41.4	8	27.6	29	15	51.7	8	27.6	23	11	47.8	9	39.1
Turkey	19	12	63.2	10	52.6	12	5	41.7	3	25.0	16	6	37.5	3	18.8	29	16	55.2	7	24.1
Other	86	21	24.4	16	18.6	110	25	22.7	10	9.1	108	39	36.1	18	16.7	78	26	33.3	11	14.1
Pacifica/Australasia	54	15	27.8	11	20.4	68	19	27.9	11	16.2	52	15	28.8	10	19.2	62	30	48.4	19	30.6
Australia	23	11	47.8	8	34.8	13	4	30.8	2	15.4	13	5	38.5	5	38.5	17	13	76.5	10	58.8
Indonesia	16	0	0.0	0	0.0	24	1	4.2	1	4.2	19	3	15.8	1	5.3	15	2	13.3	1	6.7
New Zealand	4	0	0.0	0	0.0	10	6	60.0	4	40.0	8	2	25.0	1	12.5	7	2	28.6	1	14.3
Other	11	4	36.4	3	27.3	21	8	38.1	4	19.0	12	5	41.7	3	25.0	23	13	56.5	7	30.4
Africa	131	44	33.6	26	19.8	127	56	44.1	29	22.8	122	57	46.7	21	17.2	125	58	46.4	19	15.2
Egypt	15	1	6.7	0	0.0	13	4	30.8	2	15.4	11	1	9.1	0	.	10	3	30.0	1	10.0
Nigeria	33	16	48.5	10	30.3	32	15	46.9	6	18.8	34	23	67.6	7	20.6	24	19	79.2	4	16.7
South Africa	13	6	46.2	3	23.1	11	5	45.5	3	27.3	14	6	42.9	3	21.4	12	3	25.0	1	8.3
Other Africa	70	21	30.0	13	18.6	71	32	45.1	18	25.4	63	27	42.9	11	17.5	79	33	41.8	13	16.5
Europe	175	88	50.3	65	37.1	229	126	55.0	97	42.4	238	149	62.6	102	42.9	247	124	50.2	85	34.4
Greece	18	10	55.6	6	33.3	29	12	41.4	8	27.6	24	15	62.5	8	33.3	29	18	62.1	11	37.9
United Kingdom	35	23	65.7	15	42.9	44	27	61.4	15	34.1	52	39	75.0	27	51.9	44	28	63.6	19	43.2
Germany	32	19	59.4	17	53.1	28	18	64.3	14	50.0	28	15	53.6	7	25.0	41	23	56.1	16	39.0
Italy	15	6	40.0	3	20.0	29	12	41.4	11	37.9	20	14	70.0	10	50.0	22	7	31.8	5	22.7
France	11	4	36.4	3	27.3	11	6	54.5	6	54.5	12	5	41.7	5	41.7	12	3	25.0	2	16.7
Spain	14	6	42.9	6	42.9	18	10	55.6	9	50.0	23	12	52.2	10	43.5	25	5	20.0	4	16.0
Other	50	20	40.0	15	30.0	70	41	58.6	34	48.6	79	49	62.0	35	44.3	74	40	54.1	28	37.8
North/South America	199	80	40.2	62	31.2	225	97	43.1	72	32.0	246	119	48.4	69	28.0	251	107	42.6	72	28.7
Canada	81	38	46.9	34	42.0	88	37	42.0	27	30.7	95	53	55.8	40	42.1	103	51	49.5	40	38.8
Mexico	14	5	35.7	2	14.3	26	13	50.0	10	38.5	30	9	30.0	2	6.7	28	9	32.1	5	17.9
Argentina	11	5	45.5	5	45.5	16	9	56.3	5	31.3	27	12	44.4	5	18.5	12	4	33.3	1	8.3
Brazil	23	2	8.7	1	4.3	18	6	33.3	5	27.8	23	9	39.1	5	21.7	30	10	33.3	6	20.0
Chile	17	5	29.4	3	17.6	13	3	23.1	3	23.1	14	5	35.7	3	21.4	13	3	23.1	2	15.4
Colombia	5	4	80.0	2	40.0	12	6	50.0	4	33.3	6	4	66.7	2	33.3	6	2	33.3	2	33.3
Peru	5	3	60.0	1	20.0	10	7	70.0	5	50.0	14	9	64.3	6	42.9	12	6	50.0	2	16.7
Other	43	18	41.9	14	32.6	42	16	38.1	13	31.0	37	18	48.6	6	16.2	47	22	46.8	14	29.8

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-42.
Foreign doctoral recipients from U.S. universities who plan to stay in the United States, by field and region/country of origin: 1990–97

Region /country of origin	1994					1995					1996					1997				
	Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%
Social sciences																				
East/South Asia	823	397	48.2	198	24.1	820	376	45.9	190	23.2	810	369	45.6	211	26.0	672	305	45.4	196	29.2
China	212	189	89.2	81	38.2	177	150	84.7	69	39.0	192	155	80.7	89	46.4	137	102	74.5	70	51.1
Taiwan	118	21	17.8	9	7.6	122	30	24.6	9	7.4	116	27	23.3	6	5.2	117	37	31.6	16	13.7
Japan	77	33	42.9	22	28.6	74	32	43.2	25	33.8	79	35	44.3	19	24.1	72	28	38.9	22	30.6
South Korea	241	51	21.2	26	10.8	242	48	19.8	17	7.0	221	41	18.6	22	10.0	193	43	22.3	28	14.5
India	111	80	72.1	50	45.0	135	97	71.9	59	43.7	131	91	69.5	61	46.6	105	79	75.2	53	50.5
Other	64	23	35.9	10	15.6	70	19	27.1	11	15.7	71	20	28.2	14	19.7	48	16	33.3	7	14.6
West Asia	181	71	39.2	30	16.6	166	78	47.0	40	24.1	149	57	38.3	36	24.2	113	40	35.4	23	20.4
Iran	21	14	66.7	3	14.3	15	13	86.7	5	33.3	13	11	84.6	4	30.8	7	5	71.4	4	57.1
Israel	38	17	44.7	9	23.7	29	15	51.7	7	24.1	22	10	45.5	8	36.4	20	12	60.0	9	45.0
Turkey	17	5	29.4	2	11.8	29	11	37.9	9	31.0	27	11	40.7	9	33.3	22	5	22.7	2	9.1
Other	105	35	33.3	16	15.2	93	39	41.9	19	20.4	87	25	28.7	15	17.2	64	18	28.1	8	12.5
Pacifica/Australasia	57	19	33.3	12	21.1	80	26	32.5	12	15.0	59	19	32.2	10	16.9	51	21	41.2	13	25.5
Australia	14	7	50.0	7	50.0	21	7	33.3	4	19.0	10	6	60.0	4	40.0	15	7	46.7	7	46.7
Indonesia	22	2	9.1	1	4.5	29	3	10.3	1	3.4	15	0	0.0	0	0.0	19	1	5.3	0	0.0
New Zealand	5	2	40.0	2	40.0	10	7	70.0	4	40.0	9	3	33.3	2	22.2	5	4	80.0	4	80.0
Other	16	8	50.0	2	12.5	20	9	45.0	3	15.0	25	10	40.0	4	16.0	12	9	75.0	2	16.7
Africa	146	66	45.2	15	10.3	113	57	50.4	16	14.2	118	43	36.4	13	11.0	67	29	43.3	18	26.9
Egypt	9	3	33.3	2	22.2	9	4	44.4	1	11.1	11	4	36.4	1	9.1	4	3	75.0	2	50.0
Nigeria	27	20	74.1	2	7.4	22	19	86.4	3	13.6	18	10	55.6	1	5.6	6	3	50.0	2	33.3
South Africa	14	6	42.9	3	21.4	10	3	30.0	3	30.0	12	5	41.7	2	16.7	6	2	33.3	1	16.7
Other Africa	96	37	38.5	8	8.3	72	31	43.1	9	12.5	77	24	31.2	9	11.7	51	21	41.2	13	25.5
Europe	230	127	55.2	84	36.5	249	150	60.2	103	41.4	275	148	53.8	98	35.6	222	135	60.8	100	45.0
Greece	24	8	33.3	5	20.8	26	13	50.0	7	26.9	22	13	59.1	9	40.9	18	12	66.7	10	55.6
United Kingdom	42	27	64.3	15	35.7	46	33	71.7	26	56.5	50	35	70.0	24	48.0	27	17	63.0	14	51.9
Germany	52	36	69.2	29	55.8	42	29	69.0	22	52.4	41	23	56.1	15	36.6	34	18	52.9	14	41.2
Italy	31	19	61.3	10	32.3	23	12	52.2	7	30.4	30	10	33.3	6	20.0	26	15	57.7	12	46.2
France	11	7	63.6	4	36.4	12	5	41.7	2	16.7	11	5	45.5	2	18.2	17	7	41.2	4	23.5
Spain	14	6	42.9	6	42.9	12	8	66.7	7	58.3	21	10	47.6	5	23.8	16	8	50.0	7	43.8
Other	56	24	42.9	15	26.8	88	50	56.8	32	36.4	100	52	52.0	37	37.0	107	72	67.3	51	47.7
North/South America	239	103	43.1	67	28.0	209	101	48.3	68	32.5	253	124	49.0	82	32.4	205	91	44.4	63	30.7
Canada	86	40	46.5	30	34.9	102	55	53.9	38	37.3	87	55	63.2	36	41.4	73	36	49.3	28	38.4
Mexico	28	8	28.6	4	14.3	16	5	31.3	3	18.8	27	10	37.0	7	25.9	33	9	27.3	5	15.2
Argentina	14	10	71.4	7	50.0	13	7	53.8	6	46.2	14	5	35.7	2	14.3	18	9	50.0	5	27.8
Brazil	26	8	30.8	6	23.1	14	6	42.9	3	21.4	32	11	34.4	9	28.1	18	6	33.3	4	22.2
Chile	11	2	18.2	1	9.1	7	0	0.0	0	0.0	9	2	22.2	1	11.1	9	5	55.6	3	33.3
Colombia	8	6	75.0	3	37.5	14	2	14.3	1	7.1	15	6	40.0	2	13.3	6	2	33.3	2	33.3
Peru	12	4	33.3	3	25.0	9	3	33.3	2	22.2	14	11	78.6	8	57.1	12	8	66.7	5	41.7
Other	54	25	46.3	13	24.1	34	23	67.6	15	44.1	55	24	43.6	17	30.9	36	16	44.4	11	30.6

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-42.
Foreign doctoral recipients from U.S. universities who plan to stay in the United States, by field and region/country of origin: 1990–97

Region /country of origin	1990					1991					1992					1993				
	Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.		Total Ph.D. recipients	Plan to stay in U.S.		Firm plans to stay in U.S.	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%
Engineering																				
East/South Asia	1,580	746	47.2	495	31.3	1,986	1,136	57.2	642	32.3	2,106	1,289	61.2	644	30.6	2,181	1,303	59.7	598	27.4
China	333	181	54.4	100	30.0	483	368	76.2	178	36.9	516	448	86.8	185	35.9	545	489	89.7	197	36.1
Taiwan	476	208	43.7	134	28.2	597	294	49.2	163	27.3	637	320	50.2	143	22.4	592	235	39.7	105	17.7
Japan	17	5	29.4	4	23.5	29	7	24.1	6	20.7	25	6	24.0	3	12.0	23	6	26.1	1	4.3
South Korea	360	103	28.6	66	18.3	434	148	34.1	78	18.0	437	131	30.0	65	14.9	484	161	33.3	63	13.0
India	314	211	67.2	162	51.6	357	272	76.2	191	53.5	405	335	82.7	222	54.8	448	368	82.1	209	46.7
Other	80	38	47.5	29	36.3	86	47	54.7	26	30.2	86	49	57.0	26	30.2	89	44	49.4	23	25.8
West Asia	426	209	49.1	122	28.6	411	210	51.1	99	24.1	458	262	57.2	117	25.5	441	227	51.5	88	20.0
Iran	139	75	54.0	40	28.8	123	80	65.0	34	27.6	110	83	75.5	37	33.6	95	65	68.4	26	27.4
Israel	22	10	45.5	7	31.8	27	7	25.9	2	7.4	26	13	50.0	5	19.2	23	11	47.8	3	13.0
Turkey	59	38	64.4	24	40.7	64	28	43.8	17	26.6	81	38	46.9	20	24.7	74	29	39.2	14	18.9
Other	206	86	41.7	51	24.8	197	95	48.2	46	23.4	241	128	53.1	55	22.8	249	122	49.0	45	18.1
Pacifica/Australasia	25	15	60.0	11	44.0	45	21	46.7	12	26.7	48	22	45.8	16	33.3	43	21	48.8	13	30.2
Australia	3	2	66.7	2	66.7	7	3	42.9	3	42.9	11	9	81.8	6	54.5	6	4	66.7	3	50.0
Indonesia	14	7	50.0	6	42.9	19	8	42.1	6	31.6	24	7	29.2	6	25.0	29	12	41.4	8	27.6
New Zealand	2	2	100.0	1	50.0	2	1	50.0	1	50.0	1	1	100.0	1	100.0	8	5	62.5	2	25.0
Other	6	4	66.7	2	33.3	17	9	52.9	2	11.8	12	5	41.7	3	25.0	121	60	49.6	23	19.0
Africa	187	55	29.4	36	19.3	155	59	38.1	23	14.8	138	65	47.1	37	26.8	48	19	39.6	8	16.7
Egypt	82	16	19.5	9	11.0	57	14	24.6	6	10.5	46	15	32.6	8	17.4	12	8	66.7	2	16.7
Nigeria	23	12	52.2	8	34.8	20	14	70.0	6	30.0	11	10	90.9	5	45.5	6	3	50.0	2	33.3
South Africa	12	7	58.3	6	50.0	9	2	22.2	1	11.1	6	2	33.3	2	33.3	55	30	54.5	11	20.0
Other Africa	70	20	28.6	13	18.6	69	29	42.0	10	14.5	75	38	50.7	22	29.3	244	144	59.0	89	36.5
Europe	205	92	44.9	64	31.2	200	97	48.5	61	30.5	202	107	53.0	68	33.7	244	144	59.0	89	36.5
Greece	57	28	49.1	20	35.1	70	36	51.4	22	31.4	59	31	52.5	17	28.8	68	37	54.4	27	39.7
United Kingdom	15	10	66.7	7	46.7	15	10	66.7	6	40.0	17	14	82.4	11	64.7	18	16	88.9	12	66.7
Germany	15	5	33.3	4	26.7	8	4	50.0	0	.	18	10	55.6	7	38.9	23	14	60.9	7	30.4
Italy	14	6	42.9	3	21.4	12	2	16.7	2	16.7	10	4	40.0	2	20.0	10	7	70.0	5	50.0
France	27	12	44.4	8	29.6	19	6	31.6	6	31.6	25	10	40.0	4	16.0	32	11	34.4	4	12.5
Spain	8	1	12.5	1	12.5	4	1	25.0	1	25.0	6	3	50.0	2	33.3	8	2	25.0	2	25.0
Other	69	30	43.5	21	30.4	72	38	52.8	24	33.3	67	35	52.2	25	37.3	85	57	67.1	32	37.6
North/South America	168	75	44.6	56	33.3	170	96	56.5	67	39.4	160	84	52.5	55	34.4	179	83	46.4	45	25.1
Canada	41	22	53.7	16	39.0	54	32	59.3	24	44.4	46	27	58.7	20	43.5	42	26	61.9	18	42.9
Mexico	25	10	40.0	7	28.0	22	10	45.5	9	40.9	16	5	31.3	4	25.0	27	14	51.9	6	22.2
Argentina	12	6	50.0	4	33.3	12	9	75.0	6	50.0	14	9	64.3	5	35.7	10	6	60.0	3	30.0
Brazil	31	5	16.1	4	12.9	34	15	44.1	9	26.5	31	9	29.0	4	12.9	46	8	17.4	3	6.5
Chile	11	4	36.4	3	27.3	8	2	25.0	2	25.0	10	2	20.0	2	20.0	5	4	80.0	1	20.0
Colombia	8	5	62.5	4	50.0	11	8	72.7	3	27.3	9	6	66.7	4	44.4	8	3	37.5	3	37.5
Peru	6	3	50.0	3	50.0	7	7	100.0	4	57.1	5	5	100.0	3	60.0	10	7	70.0	3	30.0
Other	34	20	58.8	15	44.1	22	13	59.1	10	45.5	29	21	72.4	13	44.8	31	15	48.4	8	25.8

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-42.
Foreign doctoral recipients from U.S. universities who plan to stay in the United States, by field and region/country of origin: 1990–97

Region /country of origin	1994 Total Ph.D. recipients	1994 Plan to stay in U.S. No.	1994 Plan to stay in U.S. %	1994 Firm plans to stay in U.S. No.	1994 Firm plans to stay in U.S. %	1995 Total Ph.D. recipients	1995 Plan to stay in U.S. No.	1995 Plan to stay in U.S. %	1995 Firm plans to stay in U.S. No.	1995 Firm plans to stay in U.S. %	1996 Total Ph.D. recipients	1996 Plan to stay in U.S. No.	1996 Plan to stay in U.S. %	1996 Firm plans to stay in U.S. No.	1996 Firm plans to stay in U.S. %	1997 Total Ph.D. recipients	1997 Plan to stay in U.S. No.	1997 Plan to stay in U.S. %	1997 Firm plans to stay in U.S. No.	1997 Firm plans to stay in U.S. %
Engineering																				
East/South Asia	2,367	1,501	63.4	664	28.1	2,441	1,678	68.7	778	31.9	2,484	1,759	70.8	1,072	43.2	2,025	1,362	67.3	938	46.3
China	657	604	91.9	226	34.4	779	726	93.2	295	37.9	809	729	90.1	436	53.9	628	504	80.3	336	53.5
Taiwan	670	306	45.7	133	19.9	616	295	47.9	126	20.5	575	310	53.9	159	27.7	420	232	55.2	131	31.2
Japan	46	12	26.1	6	13.0	30	6	20.0	4	13.3	32	8	25.0	4	12.5	37	8	21.6	6	16.2
South Korea	429	143	33.3	52	12.1	344	120	34.9	46	13.4	326	119	36.5	69	21.2	292	108	37.0	71	24.3
India	480	402	83.8	235	49.0	572	489	85.5	292	51.0	625	539	86.2	376	60.2	584	486	83.2	374	64.0
Other	85	34	40.0	12	14.1	100	42	42.0	15	15.0	117	54	46.2	28	23.9	64	24	37.5	20	31.3
West Asia	428	225	52.6	93	21.7	389	244	62.7	108	27.8	369	236	64.0	122	33.1	305	181	59.3	120	39.3
Iran	92	61	66.3	18	19.6	85	67	78.8	29	34.1	68	53	77.9	25	36.8	58	37	63.8	27	46.6
Israel	16	7	43.8	4	25.0	15	4	26.7	1	6.7	17	9	52.9	6	35.3	9	4	44.4	3	33.3
Turkey	64	20	31.3	10	15.6	73	45	61.6	24	32.9	73	51	69.9	27	37.0	86	59	68.6	40	46.5
Other	256	137	53.5	61	23.8	216	128	59.3	54	25.0	211	123	58.3	64	30.3	152	81	53.3	50	32.9
Pacifica/Australasia	50	23	46.0	12	24.0	44	19	43.2	10	22.7	39	20	51.3	11	28.2	45	19	42.2	14	31.1
Australia	11	6	54.5	3	27.3	7	5	71.4	4	57.1	6	5	83.3	3	50.0	8	2	25.0	2	25.0
Indonesia	28	9	32.1	5	17.9	29	9	31.0	2	6.9	15	2	13.3	1	6.7	21	7	33.3	5	23.8
New Zealand	1	1	100.0	0	0.0	3	2	66.7	2	66.7	2	1	50.0	0	0.0	6	3	50.0	2	33.3
Other	10	7	70.0	4	40.0	5	3	60.0	2	40.0	16	12	75.0	7	43.8	10	7	70.0	5	50.0
Africa	168	86	51.2	30	17.9	122	62	50.8	24	19.7	143	86	60.1	49	34.3	103	58	56.3	47	45.6
Egypt	63	31	49.2	13	20.6	48	16	33.3	6	12.5	59	31	52.5	21	35.6	44	17	38.6	12	27.3
Nigeria	6	5	83.3	2	33.3	14	13	92.9	4	28.6	11	11	100.0	5	45.5	7	7	100.0	5	71.4
South Africa	8	2	25.0	1	12.5	7	2	28.6	1	14.3	13	9	69.2	7	53.8	9	5	55.6	5	55.6
Other Africa	91	48	52.7	14	15.4	53	31	58.5	13	24.5	60	35	58.3	16	26.7	43	29	67.4	25	58.1
Europe	257	149	58.0	94	36.6	297	201	67.7	111	37.4	239	157	65.7	112	46.9	237	157	66.2	126	53.2
Greece	58	31	53.4	23	39.7	61	42	68.9	20	32.8	47	29	61.7	22	46.8	30	20	66.7	15	50.0
United Kingdom	15	12	80.0	7	46.7	20	18	90.0	12	60.0	10	7	70.0	5	50.0	12	10	83.3	7	58.3
Germany	29	19	65.5	11	37.9	37	23	62.2	10	27.0	16	10	62.5	8	50.0	27	19	70.4	15	55.6
Italy	11	5	45.5	2	18.2	9	5	55.6	2	22.2	8	3	37.5	1	12.5	11	5	45.5	2	18.2
France	32	16	50.0	7	21.9	24	12	50.0	5	20.8	26	14	53.8	12	46.2	12	3	25.0	3	25.0
Spain	9	2	22.2	1	11.1	6	2	33.3	1	16.7	8	6	75.0	4	50.0	9	3	33.3	3	33.3
Other	103	64	62.1	43	41.7	140	99	70.7	61	43.6	124	88	71.0	60	48.4	146	105	71.9	87	59.6
North/South America	201	94	46.8	51	25.4	170	70	41.2	42	24.7	215	102	47.4	64	29.8	175	95	54.3	74	42.3
Canada	36	21	58.3	18	50.0	41	27	65.9	16	39.0	45	31	68.9	21	46.7	45	31	68.9	26	57.8
Mexico	30	11	36.7	4	13.3	26	9	34.6	6	23.1	37	15	40.5	8	21.6	26	14	53.8	11	42.3
Argentina	7	6	85.7	5	71.4	7	4	57.1	4	57.1	8	7	87.5	4	50.0	15	13	86.7	10	66.7
Brazil	49	11	22.4	5	10.2	46	6	13.0	3	6.5	67	19	28.4	12	17.9	40	11	27.5	8	20.0
Chile	8	3	37.5	3	37.5	8	2	25.0	1	12.5	8	1	12.5	0	0.0	1	0	0.0	0	0.0
Colombia	12	7	58.3	0	0.0	10	3	30.0	3	30.0	7	3	42.9	3	42.9	4	3	75.0	3	75.0
Peru	10	9	90.0	4	40.0	5	5	100.0	2	40.0	5	4	80.0	2	40.0	8	6	75.0	3	37.5
Other	49	26	53.1	12	24.5	27	14	51.9	7	25.9	38	22	57.9	14	36.8	36	17	47.2	13	36.1

NOTES: Data include foreign doctoral recipients with either permanent or temporary visas. Doctoral recipients who "plan to stay" think that they will locate in the United States; those with "firm plans" have a postdoctoral research appointment or academic, industrial, or other firm offers of employment in the United States.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Earned Doctorates, unpublished tabulations, 1999.

See page 4-34 in Volume 1.

Appendix table 4-43.
Foreign science and engineering doctoral recipients from major countries of origin and their plans to stay in the United States: 1985–97

Year	Total S&E doctoral recipients	Foreign S&E doctoral recipients[a]				
		Total	Plans to stay		Firm plans	
			Number	Percent	Number	Percent
1985	18,113	2,401	1,201	50.0	963	40.1
1986	19,437	2,613	1,322	50.6	1,111	42.5
1987	19,894	3,018	1,479	49.0	1,257	41.7
1988	20,933	3,383	1,729	51.1	1,444	42.7
1989	21,731	3,795	1,873	49.4	1,575	41.5
1990	22,867	5,002	2,449	49.0	1,778	35.5
1991	24,019	6,167	3,690	59.8	2,397	38.9
1992	24,673	6,625	4,274	64.5	2,541	38.4
1993	25,441	7,014	4,480	63.9	2,516	35.9
1994	26,202	7,590	5,108	67.3	2,805	37.0
1995	26,515	7,842	5,533	70.6	3,000	38.3
1996	27,230	8,026	5,781	72.0	3,713	46.3
1997	26,847	7,014	4,815	68.6	3,483	49.7

[a]Foreign doctoral recipients from selected countries of Asia, Europe, and North America. Asia includes China, India, Japan, South Korea, and Taiwan. Europe includes all Scandinavian, Western, and Eastern European countries. North America includes Canada and Mexico.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Earned Doctorates, special tabulations.

See figure 4-35 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 4-44.
Foreign doctoral recipients in science and engineering in 1992/93 who were working in the United States, by field and country: 1994–97

Country of origin and degree field	Foreign doctoral recipients[a]	Percent in the United States			
		1994	1995	1996	1997
S&E fields total	16,391	48	51	52	53
Taiwan	2,149	33	34	36	36
Korea	2,056	13	11	9	9
Japan	214	17	20	21	21
China (PRC)	4,010	82	88	90	92
India	1,549	77	80	82	83
Iran	228	52	54	56	55
Australia & New Zealand	104	19	22	28	28
Egypt	180	30	29	32	33
Israel	140	31	34	36	36
South Africa	70	35	39	41	39
United Kingdom	184	46	50	51	56
France	145	22	26	28	28
Germany	204	30	40	39	38
Greece	280	42	42	44	46
Brazil	251	14	14	15	15
Mexico	213	25	25	25	27
Canada	455	40	45	47	48
All other	3,959	36	39	41	40
Physical sciences total[b]	4,821	55	59	60	61
Taiwan	489	35	36	36	36
South Korea	437	12	11	9	9
Japan	48	14	19	22	22
China (PRC)	1,698	82	89	90	94
India	423	72	77	80	81
Iran	46	54	60	67	67
Australia & New Zealand	34	30	34	41	37
Egypt	20	34	31	34	34
Israel	49	36	37	41	43
South Africa	22	45	50	55	50
United Kingdom	67	48	55	59	59
France	57	14	11	15	17
Germany	94	33	41	41	36
Greece	98	38	44	46	48
Brazil	56	19	15	15	15
Mexico	49	34	34	29	32
Canada	137	35	44	48	50
All other	997	41	46	46	43
Life sciences total	3,765	48	51	53	54
Taiwan	421	36	38	40	41
South Korea	350	25	21	18	17
Japan	45	29	34	37	44
China (PRC)	1,074	82	85	88	92
India	237	70	75	82	79
Iran	44	54	51	51	47
Australia & New Zealand	25	11	13	17	20
Egypt	54	27	29	31	35
Israel	16	22	29	27	25
South Africa	17	S	27	27	27
United Kingdom	44	28	31	31	50
France	23	25	35	32	28
Germany	39	27	39	30	32
Greece	30	53	42	46	53
Brazil	86	7	9	12	13
Mexico	85	18	19	22	22
Canada	123	40	41	45	45
All other	1,052	29	32	35	35

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 4-44.
Foreign doctoral recipients in science and engineering in 1992/93 who were working in the United States, by field and country: 1994–97

Country of origin and degree field	Foreign doctoral recipients[a]	Percent in the United States			
		1994	1995	1996	1997
Social sciences total[c]	2,278	29	31	32	32
Taiwan	163	14	12	12	12
South Korea	416	6	5	6	5
Japan	78	9	8	8	5
China (PRC)	255	62	67	67	70
India	149	56	56	58	58
Iran	20	39	40	40	41
Australia & New Zealand	32	11	13	17	20
Egypt	18	18	18	24	18
Israel	37	22	29	27	25
South Africa	20	24	30	31	31
United Kingdom	50	42	42	43	43
France	15	25	35	32	28
Germany	38	19	25	32	29
Greece	35	47	35	32	36
Brazil	35	10	14	14	14
Mexico	41	18	19	22	22
Canada	124	38	41	40	41
All other	752	27	29	31	30
Engineering total	5,199	50	53	53	54
Taiwan	1,076	33	36	37	37
South Korea	853	11	10	7	8
Japan	43	24	27	27	27
China (PRC)	983	89	94	96	97
India	740	85	89	89	90
Iran	118	52	55	56	55
Australia & New Zealand	13	30	34	41	37
Egypt	88	34	31	34	34
Israel	38	36	37	41	43
South Africa	11	45	50	55	50
United Kingdom	23	86	92	86	87
France	50	28	35	39	42
Germany	33	37	56	55	59
Greece	117	40	43	46	46
Brazil	74	21	19	21	17
Mexico	38	40	34	31	34
Canada	71	56	61	57	61
All other	980	45	48	50	50

S = suppressed

[a]Foreign doctoral recipients on temporary visas; does not include non-U.S. citizens with permanent resident visas.

[b]Physical sciences include earth, atmospheric, and oceanographic sciences, mathematics, and computer sciences.

[c]Social sciences include psychology, sociology, and other social sciences.

NOTES: Australia and New Zealand, Egypt, Israel, and South Africa are shown with separate estimates for each of the four major discipline groups. However, to preserve confidentiality, for each of these countries, physical sciences was combined with engineering and life sciences was combined with social sciences in estimating the percentages shown above.

SOURCE: Finn, Michael, *Stay Rates of Foreign Doctorate Recipients from U.S. Universities, 1997* (Oak Ridge, TN: Oak Ridge Institute for Science and Education, 2000).

See page 4-36 in Volume 1.

Appendix table 4-45.
Postdoctoral appointments in science and engineering, by citizenship status: 1988–97

Field	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
All postdoctoral appointments										
Total, all surveyed fields[a]	26,083	27,878	29,515	30,800	32,682	34,263	36,301	35,379	37,019	37,928
Total, science and engineering fields	19,687	20,864	21,770	22,808	23,825	24,599	25,727	25,995	26,518	26,806
Total sciences	18,002	18,952	19,831	20,565	21,474	22,165	23,137	23,367	23,847	23,868
Total engineering	1,685	1,912	1,939	2,243	2,351	2,434	2,590	2,628	2,671	2,938
U.S. citizen										
Total, all surveyed fields[a]	14,392	14,826	15,090	15,097	15,764	16,684	17,939	18,002	18,371	18,640
Total, science and engineering fields	10,423	10,654	10,651	10,775	11,154	11,591	12,433	12,778	12,910	12,585
Total sciences	9,838	10,003	10,043	10,130	10,393	10,750	11,429	11,791	11,854	11,511
Total engineering	585	651	608	645	761	841	1,004	987	1,056	1,074
Non-U.S. citizen										
Total, all surveyed fields[a]	11,691	13,052	14,425	15,703	16,918	17,579	18,362	17,377	18,648	19,288
Total, science and engineering fields	9,264	10,210	11,119	12,033	12,671	13,008	13,294	13,217	13,608	14,221
Total sciences	8,164	8,949	9,788	10,435	11,081	11,415	11,708	11,576	11,993	12,357
Total engineering	1,100	1,261	1,331	1,598	1,590	1,593	1,586	1,641	1,615	1,864

[a]Survey includes all science, engineering, and health fields.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Graduate Students and Postdoctorates in Science and Engineering, Fall 1997*, NSF 99-325, Project Officer, Joan Burrelli (Arlington, VA: 1999).

See page 4-37 in Volume 1.

Appendix table 4-46.
Science and engineering faculty in U.S. higher education, by teaching field and region of origin: 1997

Region of origin	Total S&E	Physical sciences	Life sciences	Math & computer sciences	Social sciences	Engineering
			Number			
Total S&E faculty	224,707	37,020	53,055	44,375	65,509	24,748
U.S. origin	179,698	29,598	45,502	32,976	55,870	15,753
Foreign origin	45,009	7,422	7,553	11,399	9,639	8,995
Asia	23,559	3,541	3,250	6,315	4,630	5,823
Europe	11,822	2,738	2,377	2,825	2,338	1,544
North America	2,307	209	596	544	878	80
Central & South America	3,164	370	655	714	880	545
Africa	3,060	309	468	743	662	878
Abroad, not specified	1,097	255	207	258	251	125
			Percent			
Total S&E faculty	100.0	100.0	100.0	100.0	100.0	100.0
U.S. origin	80.0	80.0	85.8	74.3	85.3	63.7
Foreign origin	20.0	20.0	14.2	25.7	14.7	36.3
Asia	10.5	9.6	6.1	14.2	7.1	23.5
Europe	5.3	7.4	4.5	6.4	3.6	6.2
North America	1.0	0.6	1.1	1.2	1.3	0.3
Central & South America	1.4	1.0	1.2	1.6	1.3	2.2
Africa	1.4	0.8	0.9	1.7	1.0	3.5
Abroad, not specified	0.5	0.7	0.4	0.6	0.4	0.5

NOTES: Data include scientists and engineers whose first job is in science and engineering postsecondary teaching at four-year colleges and universities in the United States. Data exclude scientists and engineers who teach in science and engineering fields in two-year or community colleges, or who teach as a secondary job.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), database on scientists and engineers (SESTAT), unpublished tabulations.

See figure 4-36 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 4-47.
Foreign-born female science and engineering faculty in U.S. higher education, by teaching field and region of origin: 1997

Region of origin	Total S&E	Physical sciences	Life sciences	Math & computer sciences	Social sciences	Engineering
Total foreign-born female S&E faculty	6,447	1,156	2,043	1,182	1,845	221
Asia	3,104	612	826	730	876	60
Europe	1,791	322	591	304	530	44
North America	283	24	113	7	135	4
Central & South America	630	38	394	24	126	48
Africa	439	160	119	117	12	31
Abroad, not specified	200	0	0	0	166	34

NOTES: Data include scientists and engineers whose first job is in science and engineering postsecondary teaching at four-year colleges and universities in the United States. Data exclude scientists and engineers who teach in science and engineering fields in two-year or community colleges, or who teach as a secondary job.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS) database on scientists and engineers (SESTAT), unpublished tabulations.

See page 4-37 in Volume 1.

Appendix table 4-48.
Major places of origin for foreign-born science and engineering faculty in U.S. higher education, by field and sex: 1997

Place of origin	Total S&E	Physical sciences	Life sciences	Math & computer sciences	Social sciences	Engineering
Total S&E faculty	224,707	37,020	53,055	44,375	65,509	24,748
			Total			
Total S&E faculty from major places of origin	21,545	3,665	3,340	5,261	4,495	4,784
India	6,876	688	1014	2,086	1,491	1,597
China	4,830	939	591	1,745	642	913
United Kingdom	3,426	942	848	318	607	711
Taiwan	1,820	122	177	431	351	739
Germany	1,309	422	227	137	463	60
South Korea	1,218	336	189	96	451	146
Greece	1,044	196	190	163	353	142
Japan	1,022	20	104	285	137	476
			Female			
Total S&E faculty from major places of origin	2,561	343	888	431	865	34
India	832	115	320	289	94	14
China	246	66	85	71	17	7
United Kingdom	405	15	238	23	126	3
Taiwan	215	17	113	20	58	7
South Korea	256	23	14	4	215	0
Germany	278	9	118	24	127	0
Greece	329	98	0	0	228	3
Japan	32	0	13	7	12	0

NOTES: Data include scientists and engineers whose first job is in science and engineering postsecondary teaching at four-year colleges and universities in the United States. Data exclude scientists and engineers who teach in science and engineering fields in two-year or community colleges, or who teach as a secondary job.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS) database on scientists and engineers (SESTAT), unpublished tabulations.

See text table 4-11 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 5-1.
Number and percent of related children under 18 in a household who are below the poverty level, by race/ethnicity: 1970–96

	Number below poverty level (in thousands)				Percent below poverty level			
Year	All	White	Black	Hispanic	All	White	Black	Hispanic
1970	10,235	6,138	3,992	NA	14.9	10.5	41.5	NA
1975	10,882	6,748	3,884	1,619	16.8	12.5	41.4	33.1
1980	11,114	6,817	3,906	1,718	17.0	13.4	42.1	30.0
1985	12,483	7,838	4,057	2,512	20.1	15.6	43.1	39.6
1990	12,715	7,696	4,412	2,750	19.9	15.1	44.2	37.7
1994	14,610	8,826	4,787	3,956	21.2	16.3	43.3	41.1
1995	13,999	8,474	4,644	3,938	20.2	15.5	41.5	39.3
1996	13,764	8,488	4,411	4,090	19.8	15.5	39.5	39.9

NA = Not available

SOURCE: National Center for Education Statistics (NCES). 1999. *Digest of Education Statistics, 1998.* NCES 1999-036. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

See figure 5-1 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 5-2.
Percentage of 15-to 24-year-olds (grades 10–12) who dropped out of school: 1976–97

Year	Total	Race/ethnicity			Family income[a]		
		White	Black	Hispanic	Low	Middle	High
1976	5.9	5.6	7.4	7.3	15.4	6.8	2.1
1980	6.1	5.2	8.2	11.7	15.8	6.4	2.5
1986	4.7	3.7	5.4	11.9	10.9	5.1	1.6
1990	4.0	3.3	5.0	7.9	9.5	4.3	1.1
1994	5.3	4.2	6.6	10.0	13.0	5.2	2.1
1995	5.7	4.5	6.4	12.4	13.3	5.7	2.0
1996	5.0	4.1	6.7	9.0	11.1	5.1	2.1
1997	4.6	3.6	5.0	9.5	12.3	4.1	1.8

[a]Low income is the bottom 20 percent of all family incomes; high income is the top 20 percent of all family incomes; and middle income is the 60 percent in between.

SOURCE: National Center for Education Statistics (NCES). 1999. *The Condition of Education, 1999.* NCES 1999-022; 1999. *Dropout Rates in the United States, 1997.* NCES 1999-082. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

See figure 5-2 in Volume 1. *Science & Engineering Indicators - 2000*

Appendix table 5-3.
Estimates of resident population, for selected age groups: 1970–97
(thousands)

Year	Total all ages	3 and 4 years	5 and 6 years	7 to 13 years	14 to 17 years	18 and 19 years
1970	203,984	6,962	7,703	28,969	15,911	7,410
1975	215,465	6,912	7,014	26,904	17,125	8,418
1980	227,225	6,366	6,291	24,800	16,143	8,718
1985	237,924	7,134	6,916	22,976	14,888	7,637
1990	249,440	7,355	7,238	24,754	13,319	7,700
1995	262,761	8,006	7,886	26,256	14,770	7,122
1996	265,179	7,905	8,063	26,487	15,149	7,320
1997	267,636	7,785	8,065	26,883	15,429	7,468

SOURCE: National Center for Education Statistics (NCES). 1999. *Digest of Education Statistics, 1998.* NCES 1999-036. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

See figure 5-2 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 5-4.
Family characteristics of 6-to 12-year-olds and 15-to 18-year olds: 1972–97

Selected family characteristic	1972	1977	1982	1987	1992	1997
6-to 12-year-olds						
Mother's education level						
Less than high school diploma	34.3	29.5	23.6	20.4	18.0	15.8
High school diploma or GED	47.6	47.4	48.0	45.9	38.8	34.8
Some college	10.8	13.4	16.5	18.9	26.1	28.8
Bachelor's degree or higher	7.2	9.8	12.0	14.8	17.2	20.5
Percentage of young adults whose mothers were employed	38.5	45.5	52.1	58.1	61.2	66.4
Percentage of young adults whose fathers were employed	93.1	91.0	88.9	90.3	89.1	91.2
Family type						
Two-parent household	86.8	81.2	77.1	74.9	72.8	71.4
Father as head of household	1.0	1.2	1.8	2.4	3.0	4.2
Mother as head of household	12.3	17.6	21.1	22.7	24.1	24.4
Number of other children in household						
0 to 1	28.8	46.4	50.1	52.3	53.5	54.5
2 to 3	46.7	40.8	41.0	40.8	39.8	39.5
4 or more	24.4	12.8	8.9	7.0	6.7	6.1
15-to 18-year-olds						
Mother's education level						
Less than high school diploma	38.4	32.5	28.1	22.6	18.7	17.0
High school diploma or GED	44.5	46.5	47.0	46.6	40.2	37.1
Some college	10.0	11.9	14.4	17.8	25.3	26.9
Bachelor's degree or higher	7.1	9.1	10.6	12.9	15.7	19.1
Percentage of young adults whose mothers were employed	48.6	53.0	59.0	65.3	69.4	73.4
Percentage of young adults whose fathers were employed	91.8	88.6	86.7	88.7	88.2	89.3
Family type						
Two-parent household	84.3	80.1	75.7	73.6	72.5	71.2
Father as head of household	2.0	2.6	2.9	3.6	3.9	5.0
Mother as head of household	13.7	17.3	21.4	22.8	23.6	23.8
Number of other children in household						
0 to 1	39.8	45.6	50.9	59.8	61.9	62.6
2 to 3	39.4	38.6	39.1	34.1	32.1	31.9
4 or more	20.8	15.9	10.0	6.1	6.1	5.5

SOURCE: National Center for Education Statistics (NCES). 1999. *The Condition of Education, 1999.* NCES 1999-022. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

See page 5-10 in Volume 1.

Appendix table 5-5.
Charter schools in operation, by state: 1992-98

	Number of charter schools starting in the year						Total schools closed as of Sept. 1998[a]	New schools as of Sept. 1998	Total schools operating Sept. 1998
	1992/93	93/94	94/95	95/96	96/97	97/98			
Total	2	34	65	154	178	284	31	331	1,022
Minnesota	2	5	7	3	3	8	2	12	38
California		28	37	30	21	19	6	19	148
Colorado		1	13	10	8	19	1	10	60
Michigan			2	41	33	36	3	24	133
New Mexico			4	0	1	0	0	0	5
Wisconsin			2	3	6	7	0	12	30
Arizona				47	58	45	14	23	159
Georgia				3	9	9	1	7	27
Hawaii				2	0	0	0	0	2
Massachusetts				15	7	3	1	10	34
Alaska					2	13	0	2	17
Delaware					2	1	0	1	4
District of Columbia					2	1	1	16	18
Florida					5	28	1	43	75
Illinois					1	7	0	6	14
Louisiana					3	3	0	4	10
Texas					17	21	0	33	71
Connecticut						12	0	4	16
Kansas						1	0	14	15
New Jersey						13	0	20	33
North Carolina						34	1	26	59
Pennsylvania						6	0	25	31
Rhode Island						1	0	1	2
South Carolina						2	0	3	5
Mississippi								1	1
Nevada								1	1
Ohio								14	14

[a]The column "Total schools closed as of Sept. 1998" reflects the cumulative number of charter schools closed since 1992.

SOURCE: California State University (CSU). 1998. *Charter Schools: National Concept, California Experience.* Proceedings of a roundtable discussion sponsored by the California Education Policy Seminar and the California State University Institute for Education Reform. Sacramento, CA. October 1.

See figure 5-3 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 5-6.
Percentage and standard error of 9-year-old students at the indicated level of NAEP science achievement, by gender, race/ethnicity, and region: 1977–96

Student gender, race/ ethnicity, and region	1977	1982	1986	1990	1992	1994	1996	*	‡	L	Q
Level 200											
Total	68.0 (1.1)	70.7 (1.9)	72.0 (1.1)	76.4 (0.9)	78.0 (1.2)	77.4 (1.0)	76.1 (1.2)	+		+	
Male	69.5 (1.2)	69.7 (2.0)	74.1 (1.4)	76.3 (1.2)	80.4 (1.4)	77.6 (0.9)	76.8 (1.8)	+		+	
Female	66.5 (1.1)	71.8 (2.2)	70.0 (1.3)	76.4 (1.1)	75.7 (1.2)	77.2 (1.4)	75.5 (1.0)	+		+	
White	76.8 (0.7)	78.4 (2.0)	78.9 (1.0)	84.4 (0.7)	85.5 (0.9)	85.6 (1.0)	83.8 (1.2)	+		+	
Black	27.2 (1.5)	38.9 (2.7)	46.2 (2.3)	46.4 (3.1)	51.3 (3.5)	51.6 (2.3)	52.2 (3.4)	+		+	
Hispanic	42.0 (3.1)	40.2 (6.1)	50.1 (3.7)	56.3 (3.7)	55.5 (4.3)	49.9 (3.1)	57.8 (3.1)	+		+	
Other	62.0 (6.9)	NA	67.4 (4.1)	76.3 (7.0)	73.2 (3.7)	65.3 (5.6)	70.1 (4.9)				
Northeast	72.6 (1.6)	71.5 (3.5)	75.6 (2.5)	78.2 (2.3)	80.6 (2.2)	80.0 (2.7)	79.1 (1.8)	+		+	
Southeast	55.0 (2.4)	63.0 (3.6)	67.3 (3.0)	68.4 (2.4)	71.4 (2.4)	74.5 (2.7)	71.6 (3.1)	+		+	
Central	72.5 (2.1)	75.4 (3.7)	75.2 (2.1)	81.9 (1.3)	83.7 (1.4)	81.9 (2.2)	79.1 (2.2)			+	
West	68.5 (2.3)	71.4 (3.8)	69.9 (3.0)	76.8 (2.1)	75.9 (2.7)	73.6 (2.1)	74.9 (1.6)				
Level 250											
Total	25.7 (0.7)	24.3 (1.8)	27.5 (1.4)	31.1 (0.8)	32.8 (1.0)	33.7 (1.2)	32.2 (1.3)	+		+	
Male	27.4 (0.9)	25.6 (2.6)	29.9 (2.0)	33.1 (1.1)	37.2 (1.7)	35.3 (1.4)	33.9 (1.9)	+		+	
Female	24.0 (0.9)	23.0 (2.0)	25.1 (1.4)	29.1 (1.0)	28.6 (1.1)	32.2 (1.5)	30.7 (1.9)	+		+	
White	30.8 (0.7)	29.4 (2.1)	32.7 (1.5)	37.5 (1.1)	39.4 (1.1)	40.8 (1.5)	39.6 (1.5)	+		+	
Black	3.5 (0.6)	3.9 (1.3)	8.3 (1.5)	8.5 (1.1)	9.2 (1.4)	11.1 (1.4)	10.6 (2.0)	+		+	
Hispanic	8.8 (1.7)	4.2 (2.7)	10.7 (2.4)	11.6 (2.1)	11.7 (1.8)	10.8 (2.5)	13.1 (3.1)				
Other	20.5 (4.9)	NA	27.1 (5.8)	30.1 (6.0)	30.4 (4.7)	22.1 (4.3)	25.8 (4.9)				
Northeast	28.9 (1.1)	25.8 (3.1)	30.5 (2.9)	33.4 (2.9)	35.9 (2.7)	36.8 (2.3)	35.0 (2.6)			+	
Southeast	17.2 (1.5)	20.2 (3.6)	23.3 (3.0)	24.9 (1.4)	26.5 (1.8)	30.4 (2.3)	27.9 (3.0)	+		+	
Central	29.2 (1.6)	27.5 (3.6)	30.1 (2.3)	34.4 (1.8)	38.7 (2.3)	38.1 (2.6)	35.9 (2.7)			+	
West	25.3 (1.2)	23.1 (4.6)	26.2 (2.6)	31.7 (1.7)	29.8 (2.2)	30.1 (2.7)	30.7 (2.6)				

NA = Data are unavailable for this assessment year; NAEP = National Assessment of Educational Progress

NOTES: Standard errors of the estimated percentages appear in parentheses.

* Indicates that the percentage in 1996 is significantly larger (+) or smaller (-) than that in 1977.

‡ Indicates that the percentage in 1996 is significantly larger (+) or smaller (-) than that in 1994.

L Indicates that the positive (+) or negative (-) linear trend is significant; Q Indicates that the positive (+) or negative (-) quadratic trend is significant.

SOURCE: National Center for Education Statistics (NCES). 1997. *NAEP 1996 Trends in Academic Progress*. NCES 97-985. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

See figures 5-4 and 5-6 and text table 5-3 in Volume 1.

Appendix table 5-7.
Percentage and standard errors of 13-year-old students at the indicated level of NAEP science achievement, by sex, race/ethnicity, and region: 1977–96

Student gender, race/ethnicity, and region	1977	1982	1986	1990	1992	1994	1996	*	‡	L	Q
Level 200											
Total	86.0 (0.7)	89.8 (0.8)	91.6 (1.0)	92.3 (0.7)	93.1 (0.5)	92.4 (0.6)	92.0 (0.8)	+		+	-
Male	87.2 (0.8)	91.9 (0.8)	92.9 (1.0)	92.7 (0.8)	93.1 (0.8)	92.2 (0.8)	93.2 (0.9)	+		+	-
Female	84.7 (0.8)	87.9 (1.0)	90.3 (1.2)	92.0 (0.8)	93.1 (0.7)	92.6 (0.6)	90.9 (1.2)	+		+	-
White	92.2 (0.5)	94.4 (0.6)	96.1 (0.8)	96.9 (0.4)	97.9 (0.4)	97.6 (0.4)	97.0 (0.5)	+		+	-
Black	57.3 (2.4)	68.6 (2.4)	73.6 (3.0)	77.6 (3.6)	73.8 (2.8)	73.5 (3.2)	75.9 (2.7)	+		+	-
Hispanic	62.2 (2.4)	75.5 (3.3)	76.7 (3.2)	80.2 (2.9)	86.2 (2.6)	81.2 (2.5)	81.0 (2.8)	+		+	-
Other	80.9 (2.9)	94.2 (2.4)	93.6 (3.8)	88.1 (4.9)	94.5 (1.9)	92.6 (1.9)	90.1 (1.6)	+			
Northeast ..	90.7 (1.4)	91.5 (1.1)	93.5 (1.2)	92.6 (1.8)	91.6 (1.5)	95.4 (1.0)	91.4 (1.7)				
Southeast ..	78.1 (1.7)	83.6 (2.2)	89.8 (1.7)	91.0 (1.2)	90.7 (1.5)	90.6 (1.3)	90.4 (1.4)	+		+	-
Central	89.9 (1.1)	92.0 (1.3)	91.9 (3.5)	94.6 (1.8)	95.4 (0.8)	94.0 (2.0)	95.8 (1.2)	+		+	
West	83.5 (1.5)	91.3 (1.4)	91.3 (1.6)	91.2 (1.3)	94.1 (1.0)	90.4 (1.3)	90.8 (1.2)	+		+	-
Level 250											
Total	48.8 (1.1)	50.9 (1.6)	52.5 (1.6)	56.5 (1.0)	61.3 (1.1)	59.5 (1.1)	57.6 (1.1)	+		+	
Male	52.3 (1.3)	56.2 (1.8)	57.3 (2.1)	59.8 (1.3)	62.9 (1.4)	62.0 (1.3)	61.7 (1.4)	+		+	
Female	45.4 (1.2)	46.0 (1.6)	47.7 (1.7)	53.3 (1.4)	59.6 (1.4)	57.1 (1.4)	53.8 (1.5)	+		+	
White	56.5 (0.9)	58.3 (1.4)	61.0 (1.7)	66.5 (1.2)	71.1 (1.3)	70.5 (1.1)	68.5 (1.2)	+		+	
Black	14.9 (1.7)	17.1 (1.9)	19.6 (2.8)	24.3 (3.3)	26.2 (2.8)	22.4 (4.3)	25.5 (2.2)	+		+	
Hispanic	18.1 (1.8)	24.1 (5.1)	24.9 (4.3)	30.0 (2.8)	36.5 (2.9)	31.6 (3.3)	30.9 (3.3)	+		+	
Other	35.6 (4.9)	64.8 (7.1)	52.6 (6.6)	47.1 (10.2)	62.0 (3.9)	58.9 (4.7)	50.2 (4.5)				
Northeast ..	56.1 (2.0)	55.1 (2.7)	59.0 (4.0)	58.1(2.7)	60.4 (2.8)	66.3 (2.0)	56.6 (3.9)				
Southeast ..	37.5 (1.6)	40.1 (2.3)	48.6 (3.3)	52.7(2.7)	57.5 (2.5)	54.6 (3.2)	51.8 (2.6)	+		+	
Central	54.8 (2.0)	54.1 (3.5)	49.5 (6.3)	62.7(3.1)	66.2 (2.2)	64.1 (3.7)	68.6 (1.9)	+		+	
West	44.5 (2.4)	53.0 (3.3)	53.3 (2.8)	53.2(2.2)	60.4 (2.2)	54.6 (2.1)	54.7 (1.6)	+		+	

NAEP = National Assessment of Educational Progress

NOTE: Standard errors of the estimated percentages appear in parentheses.

* Indicates that the percentage in 1996 is significantly larger (+) or smaller (-) than that in 1977.

‡ Indicates that the percentage in 1996 is significantly larger (+) or smaller (-) than that in 1994.

L Indicates that the positive (+) or negative (-) linear trend is significant; Q Indicates that the positive (+) or negative (-) quadratic trend is significant.

SOURCE: National Center for Education Statistics (NCES). 1997. *NAEP 1996 Trends in Academic Progress.* NCES 97-985. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

See figures 5-4 and 5-6 and text table 5-3 in Volume 1.

Appendix table 5-8.
Percentage and standard errors of 17-year-old students at the indicated level of NAEP science achievement, by sex, race/ethnicity, and region: 1977–96

Student gender, race/ethnicity, and region	1977	1982	1986	1990	1992	1994	1996	*	‡	L	Q
Level 250											
Total	81.6 (0.7)	76.6 (1.0)	80.7 (1.3)	81.2 (0.9)	83.3 (1.2)	83.1 (1.2)	83.8 (0.9)			+	+
Male	85.2 (0.7)	81.2 (1.2)	82.4 (1.4)	82.5 (1.2)	85.0 (1.4)	84.9 (1.3)	83.8 (1.1)				
Female	78.0 (1.0)	72.2 (1.3)	79.1 (1.7)	79.9 (1.4)	81.6 (1.4)	81.6 (1.6)	83.7 (1.2)	+		+	+
White	88.2 (0.4)	84.9 (0.9)	87.8 (1.4)	89.6 (0.8)	90.5 (1.0)	91.5 (0.9)	91.2 (0.7)	+		+	
Black	40.5 (1.5)	35.0 (2.1)	52.2 (3.2)	51.4 (3.7)	55.7 (3.7)	58.1 (3.7)	59.8 (3.2)	+		+	
Hispanic	61.5 (1.7)	48.0 (2.7)	60.0 (7.2)	59.5 (5.0)	68.3 (6.6)	58.6 (7.4)	67.6 (4.5)				
Other	78.7 (2.9)	65.4 (5.8)	71.0 (7.0)	79.2 (3.8)	78.4 (4.4)	82.7 (5.0)	79.5 (6.0)				
Northeast ..	85.4 (1.6)	77.5 (1.9)	80.3 (3.9)	82.1 (2.8)	85.8 (2.3)	85.5 (2.9)	83.9 (2.4)				
Southeast ..	72.2 (1.5)	71.2 (2.3)	76.9 (1.9)	76.8 (2.2)	76.1 (2.0)	80.2 (2.4)	78.9 (1.9)			+	
Central	85.1 (1.1)	81.1 (2.3)	85.7 (1.8)	86.9 (2.0)	90.3 (2.2)	85.4 (2.9)	91.1 (1.6)	+		+	
West	79.9 (1.2)	74.8 (2.5)	78.8 (3.0)	79.0 (1.9)	81.7 (3.0)	81.7 (3.0)	81.2 (2.1)				
Level 300											
Total	41.7 (0.9)	37.3 (0.9)	41.3 (1.4)	43.3 (1.3)	46.6 (1.5)	47.5 (1.3)	48.4 (1.3)	+		+	+
Male	48.8 (1.1)	45.2 (1.2)	48.8 (2.1)	48.2 (1.6)	50.9 (2.0)	52.9 (1.8)	53.1 (1.5)	+		+	
Female	34.8 (1.0)	29.9 (1.2)	34.1 (1.5)	38.7 (1.7)	42.0 (1.7)	42.4 (1.8)	43.9 (1.7)	+		+	+
White	47.5 (0.7)	43.9 (1.1)	48.7 (1.7)	51.2 (1.5)	55.4 (1.7)	57.5 (1.6)	58.5 (1.6)	+		+	+
Black	7.7 (1.0)	6.5 (1.1)	12.5 (2.2)	15.7 (4.0)	14.1 (2.5)	15.4 (2.3)	17.7 (2.7)	+		+	
Hispanic	18.5 (2.1)	11.1 (2.0)	14.8 (2.9)	21.1 (3.3)	23.0 (3.8)	21.7 (4.1)	23.9 (2.5)	+			
Other	36.6 (3.8)	25.2 (4.8)	35.0 (8.1)	45.2 (6.5)	42.9 (6.1)	44.4 (8.0)	46.8 (7.5)				
Northeast ..	47.9 (1.8)	38.3 (1.9)	46.6 (4.0)	45.7 (2.7)	52.0 (2.5)	52.0 (3.6)	48.4 (4.0)				
Southeast ..	31.6 (1.8)	32.2 (2.2)	37.0 (2.0)	37.5 (2.7)	36.9 (2.8)	40.9 (2.5)	41.2 (2.9)	+		+	
Central	45.0 (1.3)	42.1 (2.2)	45.0 (2.5)	51.7 (3.1)	56.4 (2.6)	51.1 (2.7)	59.0 (3.2)	+		+	
West	38.6 (1.4)	35.0 (2.2)	36.3 (3.5)	38.7 (2.5)	42.2 (3.4)	46.2 (3.5)	45.2 (2.3)			+	

NAEP = National Assessment of Educational Progress

NOTES: Standard errors of the estimated percentages appear in parentheses. When no value appears (xx), statistical tests involving this value should be interpreted with caution; standard error estimates may not be accurately determined and/or the sampling distribution of the statistic does not match statistical test assumptions (see source for additional detail).

*Indicates that the percentage in 1996 is significantly larger (+) or smaller (-) than that in 1977.

‡ Indicates that the percentage in 1996 is significantly larger (+) or smaller (-) than that in 1994.

L Indicates that the positive (+) or negative (-) linear trend is significant; Q Indicates that the positive (+) or negative (-) quadratic trend is significant.

SOURCE: National Center for Education Statistics (NCES). 1997. *NAEP 1996 Trends in Academic Progress.* NCES 97-985. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

See figures 5-4 and 5-6 and text table 5-3 in Volume 1.

Appendix table 5-9.
Percentage and standard errors of 9-year-old students at the indicated level of NAEP mathematics achievement, by gender race/ethnicity, and region: 1978–96

Student gender, race/ethnicity, and region	1978	1982	1986	1990	1992	1994	1996	*	‡	L	Q
Level 200											
Total	70.4 (0.9)	71.4 (1.2)	74.1 (1.2)	81.5 (1.0)	81.4 (0.8)	82.0 (0.7)	81.5 (0.8)	+		+	
Male	68.9 (1.0)	68.8 (1.3)	74.0 (1.4)	80.6 (1.0)	81.9 (1.0)	82.3 (0.9)	82.5 (1.1)	+		+	
Female	72.0 (1.1)	74.0 (1.3)	74.3 (1.3)	82.3 (1.3)	80.9 (1.1)	81.7 (0.9)	80.7 (0.9)	+		+	
White	76.3 (1.0)	76.8 (1.2)	79.6 (1.3)	86.9 (0.9)	86.9 (0.7)	87.0 (0.8)	86.6 (0.8)	+		+	
Black	42.0 (1.4)	46.1 (2.4)	53.4 (2.5)	60.0 (2.8)	59.8 (2.8)	65.9 (2.6)	65.3 (2.4)	+		+	
Hispanic	54.2 (2.8)	55.7 (2.3)	57.6 (2.9)	68.4 (3.0)	65.0 (2.9)	63.5 (3.1)	67.1 (2.1)	+		+	
Other	80.3 (3.6)	85.2 (3.4)	70.4 (8.0)	87.0 (5.4)	87.8 (3.1)	79.6 (3.9)	82.7 (3.4)				
Northeast ..	78.7 (2.3)	78.0 (2.1)	77.9 (3.2)	85.9 (2.2)	85.5 (1.8)	87.0 (1.9)	85.4 (1.7)			+	
Southeast ..	60.3 (1.8)	62.5 (2.3)	70.6 (2.7)	75.1 (2.8)	72.9 (2.0)	80.7 (1.0)	78.1 (1.7)	+		+	
Central	75.9 (1.7)	73.8 (2.7)	77.6 (2.5)	83.7 (1.3)	85.3 (1.4)	85.0 (1.5)	83.9 (1.9)	+		+	
West	65.6 (1.7)	71.9 (2.2)	70.5 (2.9)	81.4 (1.8)	81.6 (2.1)	76.4 (1.6)	79.5 (1.4)	+		+	
Level 250											
Total	19.6 (0.7)	18.8 (1.0)	20.7 (0.9)	27.7 (0.9)	27.8 (0.9)	29.1 (1.1)	29.7 (1.0)	+		+	
Male	19.2 (0.6)	18.1 (1.1)	20.9 (1.1)	27.5 (1.0)	29.4 (1.2)	31.5 (1.6)	32.7 (1.7)	+		+	+
Female	19.9 (1.0)	19.6 (1.1)	20.6 (1.3)	27.9 (1.3)	26.3 (1.5)	28.3 (1.3)	26.7 (1.1)	+		+	
White	22.9 (0.9)	21.8 (1.1)	24.6 (1.0)	32.7 (1.0)	32.4 (1.0)	35.3 (1.3)	35.7 (1.4)	+		+	
Black	4.1 (0.6)	4.4 (0.8)	5.6 (0.9)	9.4 (1.7)	9.6 (1.4)	11.1 (1.7)	10.0 (1.2)	+		+	
Hispanic	9.2 (2.5)	7.8 (1.7)	7.3 (2.8)	11.3 (3.5)	11.7 (2.5)	9.7 (1.8)	13.8 (2.3)				
Other	25.1 (3.6)	38.3 (4.7)	25.1 (6.4)	31.7 (3.6)	38.7 (5.2)	31.2 (5.5)	30.5 (4.4)				
Northeast ..	25.9 (1.6)	23.8 (1.4)	24.8 (2.7)	34.4 (2.1)	32.4 (2.1)	37.2 (2.8)	35.6 (2.6)	+		+	
Southeast ..	13.4 (0.8)	13.6 (1.7)	17.2 (2.4)	24.0 (2.0)	20.3 (1.6)	27.3 (2.4)	25.8 (2.2)	+		+	
Central	23.2 (1.4)	19.9 (2.5)	24.7 (1.8)	27.5 (1.8)	31.4 (1.9)	30.3 (2.6)	31.6 (2.7)	+		+	
West	14.9 (1.1)	18.6 (1.4)	16.3 (2.2)	25.6 (1.6)	27.1 (2.5)	26.0 (1.2)	26.9 (1.6)	+		+	

NAEP = National Assessment of Educational Progress

NOTES: Standard errors of the estimated percentages appear in parentheses. When no value appears (xx), statistical tests involving this value should be interpreted with caution; standard error estimates may not be accurately determined and/or the sampling distribution of the statistic does not match statistical test assumptions (see source for additional detail).

*Indicates that the percentage in 1996 is significantly larger (+) or smaller (-) than that in 1978.

‡ Indicates that the percentage in 1996 is significantly larger (+) or smaller (-) than that in 1994.

L Indicates that the positive (+) or negative (-) linear trend is significant; Q Indicates that the positive (+) or negative (-) quadratic trend is significant.

SOURCE: National Center for Education Statistics (NCES). 1997. *NAEP 1996 Trends in Academic Progress.* NCES 97-985. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

See figures 5-5 and 5-7 and text table 5-4 in Volume 1.

Appendix table 5-10.
Percentage and standard errors of 13-year-old students at the indicated level of NAEP mathematics achievement, by gender, race/ethnicity, and region: 1978-96

Student gender, race/ethnicity, and region	1978	1982	1986	1990	1992	1994	1996	*	‡	L	Q
Level 200											
Total	94.6 (0.5)	97.7 (0.4)	98.6 (0.2)	98.5 (0.2)	98.7 (0.3)	98.5 (0.3)	98.8 (0.2)	+		+	-
Male	93.9 (0.5)	97.5 (0.6)	98.5 (0.3)	98.2 (0.3)	98.8 (0.4)	98.3 (0.4)	98.7 (0.3)	+		+	-
Female	95.2 (0.5)	98.0 (0.3)	98.6 (0.3)	98.9 (0.2)	98.6 (0.2)	98.7 (0.3)	98.8 (0.3)	+		+	-
White	97.6 (0.3)	99.1 (0.1)	99.3 (0.3)	99.4 (0.1)	99.6 (0.2)	99.3 (0.2)	99.6 (0.2)	+		+	-
Black	79.7 (1.5)	90.2 (1.6)	95.4 (0.9)	95.4 (1.1)	95.0 (1.4)	95.6 (1.6)	96.2 (1.3)	+		+	-
Hispanic	86.4 (0.9)	95.9 (0.9)	96.9 (1.4)	96.8 (1.1)	98.1 (0.7)	97.1 (1.3)	96.2 (0.8)	+		+	-
Other	97.3 (1.5)	99.1 (0.6)	99.6 (x.x)	98.3 (1.0)	99.0 (x.x)	99.3 (x.x)	98.7 (x.x)				
Northeast	96.5 (0.9)	99.0 (0.3)	99.2 (0.2)	99.1 (0.6)	98.6 (0.7)	99.5 (0.3)	98.9 (0.5)				
Southeast	90.1 (1.6)	95.6 (1.0)	98.3 (0.6)	97.8 (0.6)	98.0 (0.7)	98.2 (0.5)	98.4 (0.7)	+		+	-
Central	96.8 (0.4)	98.6 (0.5)	98.4 (1.0)	99.0 (0.3)	99.3 (0.4)	98.7 (0.9)	99.2 (0.3)	+		+	
West	94.0 (0.9)	97.6 (0.9)	98.3 (0.5)	98.3 (0.5)	98.8 (0.4)	98.0 (0.5)	98.6 (0.4)	+		+	-
Level 250											
Total	64.9 (1.2)	71.4 (1.2)	73.3 (1.6)	74.7 (1.0)	77.9 (1.1)	78.1 (1.1)	78.6 (0.9)	+		+	
Male	63.9 (1.3)	71.3 (1.4)	73.8 (1.8)	75.1 (1.8)	78.1 (1.6)	78.9 (1.5)	79.8 (1.4)	+		+	
Female	65.9 (1.2)	71.4 (1.3)	72.7 (1.9)	74.4 (1.3)	77.7 (1.1)	77.3 (1.0)	77.4 (1.1)	+		+	
White	72.9 (0.9)	78.3 (0.9)	78.9 (1.7)	82.0 (1.0)	84.9 (1.1)	85.5 (0.9)	86.4 (1.0)	+		+	
Black	28.7 (2.1)	37.9 (2.5)	49.0 (3.7)	48.7 (3.6)	51.0 (2.7)	51.0 (3.9)	53.7 (2.6)	+		+	
Hispanic	36.0 (2.9)	52.2 (2.5)	56.0 (5.0)	56.7 (3.3)	63.3 (2.7)	59.2 (2.2)	58.3 (2.3)	+		+	-
Other	68.6 (4.3)	75.3 (5.9)	85.7 (4.7)	76.5 (5.0)	82.9 (3.2)	84.8 (3.0)	81.1 (3.5)				
Northeast	73.4 (2.4)	79.4 (1.5)	80.5 (2.2)	78.2 (2.3)	78.4 (2.5)	86.7 (1.4)	79.5 (3.1)				
Southeast	53.5 (3.6)	60.3 (2.0)	68.6 (2.3)	70.1 (2.4)	74.8 (2.7)	73.9 (3.1)	75.3 (2.1)	+		+	
Central	70.4 (1.9)	75.9 (2.4)	70.7 (6.3)	77.9 (2.8)	80.6 (1.8)	78.9 (3.4)	85.0 (1.9)	+		+	
West	60.5 (2.4)	69.0 (3.0)	73.9 (2.2)	72.9 (1.8)	77.7 (2.0)	74.7 (1.8)	75.7 (1.7)	+		+	-

NAEP = National Assessment of Educational Progress

NOTES: Standard errors of the estimated percentages appear in parentheses. When no value appears (xx), statistical tests involving this value should be interpreted with caution; standard error estimates may not be accurately determined and/or the sampling distribution of the statistic does not match statistical test assumptions (see source for additional detail).

*Indicates that the percentage in 1996 is significantly larger (+) or smaller (-) than that in 1978

‡ Indicates that the percentage in 1996 is significantly larger (+) or smaller (-) than that in 1994

L Indicates that the positive (+) or negative (-) linear trend is significan; Q Indicates that the positive (+) or negative (-) quadratic trend is significant

SOURCE: National Center for Education Statistics (NCES). 1997. *NAEP 1996 Trends in Academic Progress.* NCES 97-985. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

See figures 5-5 and 5-7 and text table 5-4 in Volume 1.

Appendix table 5-11.
Percentage and standard errors of 17-year-old students at the indicated level of NAEP mathematics achievement, by gender, race/ethnicity, and region: 1978–96

Student gender, race/ethnicity, and region	1978	1982	1986	1990	1992	1994	1996	*	‡	L	Q
Level 250											
Total	92.0 (0.5)	93.0 (0.5)	95.6 (0.5)	96.0 (0.5)	96.6 (0.5)	96.5 (0.5)	96.8 (0.4)	+		+	-
Male	93.0 (0.5)	93.9 (0.6)	96.1 (0.6)	95.8 (0.8)	96.9 (0.6)	97.3 (0.6)	97.0 (0.7)	+		+	
Female	91.0 (0.6)	92.1 (0.6)	95.1 (0.7)	96.2 (0.8)	96.3 (0.8)	96.0 (0.6)	96.7 (0.6)	+		+	
White	95.6 (0.3)	96.2 (0.3)	98.0 (0.4)	97.6 (0.3)	98.3 (0.4)	98.4 (0.4)	98.7 (0.4)	+		+	
Black	70.7 (1.7)	76.4 (1.5)	85.6 (2.5)	92.4 (2.2)	89.6 (2.5)	90.6 (1.8)	90.6 (1.3)	+		+	-
Hispanic	78.3 (2.3)	81.4 (1.9)	89.3 (2.5)	85.8 (4.2)	94.1 (2.2)	91.8 (3.6)	92.2 (2.2)	+		+	
Other	94.5 (2.6)	97.2 (1.7)	91.9 (2.7)	97.9 (x.x)	96.5 (1.7)	97.0 (x.x)	97.4 (1.2)				
Northeast	93.8 (0.6)	95.2 (0.9)	96.6 (0.9)	94.5 (1.7)	97.3 (0.7)	97.3 (0.8)	97.5 (1.0)	+		+	
Southeast	87.6 (1.3)	89.2 (1.7)	94.1 (1.0)	96.2 (0.7)	95.6 (1.7)	95.6 (0.7)	95.7 (0.7)	+		+	
Central	94.9 (0.8)	94.8 (0.5)	96.8 (0.9)	97.8 (0.6)	97.9 (0.7)	97.3 (0.8)	99.0 (0.6)	+		+	
West	90.5 (1.1)	91.8 (1.0)	94.8 (1.1)	95.5 (1.0)	95.8 (1.2)	96.1 (1.4)	95.4 (0.9)	+		+	
Level 300											
Total	51.5 (1.1)	48.5 (1.3)	51.7 (1.4)	56.1 (1.4)	59.1 (1.3)	58.6 (1.4)	60.1 (1.7)	+		+	
Male	55.1 (1.2)	51.9 (1.5)	54.6 (1.8)	57.6 (1.4)	60.5 (1.8)	60.2 (2.1)	62.7 (1.8)	+		+	
Female	48.2 (1.3)	45.3 (1.4)	48.9 (1.7)	54.7 (1.8)	57.7 (1.6)	57.2 (1.4)	57.6 (2.2)	+		+	
White	57.6 (1.1)	54.7 (1.4)	59.1 (1.7)	63.2 (1.6)	66.4 (1.4)	67.0 (1.4)	68.7 (2.2)	+		+	
Black	16.8 (1.6)	17.1 (1.5)	20.8 (2.8)	32.8 (4.5)	29.8 (3.9)	29.8 (3.4)	31.2 (2.5)	+		+	
Hispanic	23.4 (2.7)	21.6 (2.2)	26.5 (4.5)	30.1 (3.1)	39.2 (4.9)	38.3 (5.5)	40.1 (3.5)	+		+	
Other	64.7 (4.9)	62.0 (6.8)	54.9 (8.2)	61.6 (7.0)	69.8 (4.8)	66.4 (6.6)	63.5 (7.2)				
Northeast	59.2 (2.1)	55.6 (2.5)	58.9 (2.9)	55.7 (3.2)	64.8 (2.8)	66.6 (3.8)	61.3 (4.7)				
Southeast	42.4 (1.9)	41.7 (2.6)	45.5 (2.0)	49.4 (2.8)	51.6 (2.8)	51.3 (2.5)	53.1 (3.0)	+		+	
Central	57.1 (2.3)	52.0 (2.3)	53.9 (2.6)	65.3 (3.3)	68.5 (3.0)	60.2 (3.2)	69.6 (3.5)	+		+	
West	45.3 (2.3)	43.3 (2.7)	48.3 (4.1)	53.8 (2.6)	53.1 (3.3)	57.1 (2.6)	56.6 (3.3)			+	

NAEP = National Assessment of Educational Progress

NOTES: Standard errors of the estimated percentages appear in parentheses. When no value appears (xx), statistical tests involving this value should be interpreted with caution; standard error estimates may not be accurately determined and/or the sampling distribution of the statistic does not match statistical test assumptions (see source for additional details).

*Indicates that the percentage in 1996 is significantly larger (+) or smaller (-) than that in 1978.

‡ Indicates that the percentage in 1996 is significantly larger (+) or smaller (-) than that in 1994.

L Indicates that the positive (+) or negative (-) linear trend is significant; Q Indicates that the positive (+) or negative (-) quadratic trend is significant.

SOURCE: National Center for Education Statistics (NCES). 1997. *NAEP 1996 Trends in Academic Progress.* NCES 97-985. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

See figures 5-5 and 5-7 and text table 5-4 in Volume 1.

Appendix table 5-12.
Trends in differences in average scale scores by race/ethnicity and gender

Race/ethnicity and gender	Science			Mathematics		
	1969-70	1996	Trends	1973	1996	Trends
White vs. black students (white minus black)						
Age 17	54*	47	I	40*	27	IQ
Age 13	49*	40	IQ	46*	29	IQ
Age 9	57*	37	IQ	35*	25	I
White vs. Hispanic[a] students (white minus Hispanic)						
Age 17	35	38		33*	21	I
Age 13	43*	34		35*	26	IQ
Age 9	38	32		23	22	
Male vs. female students (male minus female)						
Age 17	17*	8	I	8	5	I
Age 13	4	9	q	-2*	4	L
Age 9	5	3		-3*	4	L

L = Positive Linear Trend; Q = Positive Quadratic Trend; I = Negative Linear Trend; q = Negative Quadratic Trend

[a]For Hispanic students, the data cover assessments from 1977 to 1996.

*Differences in scores show significant change when compared to 1996, at a 5 percent combined significance level per set of comparisons.

SOURCES: National Center for Education Statistics (NCES). 1997. *NAEP 1996 Trends in Academic Progress.* NCES 97-985; 1998. *NAEP Facts: Long-Term Trends in Student Mathematics Performance* 3 No. 2. August; 1998. *NAEP Facts: Long-Term Trends in Student Science Performance* 3 No. 3. September. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

See page 5-17 in Volume 1.

Appendix table 5-13.
Overall mean and average percentage correct on grade 4 TIMSS science assessment, by country and content area: 1994–95

Country	Mean		Percentage correct: All science content areas		Earth sciences		Life sciences		Physical sciences		Environmental issues/ nature of science	
All countries	524.0	(0.7)	59.0	(0.1)	57.0	(0.1)	64.0	(0.1)	57.0	(0.2)	51.0	(0.2)
(Australia)	562.0	(2.9)	66.0	(0.5)	61.0	(0.6)	72.0	(0.5)	63.0	(0.7)	63.0	(0.8)
(Austria)	565.0	(3.3)	66.0	(0.7)	62.0	(0.8)	72.0	(0.7)	64.0	(0.8)	54.0	(1.0)
Canada	549.0	(3.0)	64.0	(0.6)	62.0	(0.6)	68.0	(0.6)	61.0	(0.7)	56.0	(0.7)
Cyprus	475.0	(3.3)	51.0	(0.5)	48.0	(0.7)	55.0	(0.5)	50.0	(0.7)	42.0	(1.0)
Czech Republic	557.0	(3.1)	65.0	(0.5)	64.0	(0.6)	71.0	(0.5)	62.0	(0.7)	56.0	(0.9)
(England and Wales)	551.0	(3.3)	63.0	(0.6)	61.0	(0.6)	68.0	(0.6)	60.0	(0.8)	56.0	(1.0)
Greece	497.0	(4.1)	54.0	(0.8)	52.0	(0.9)	61.0	(0.9)	49.0	(0.9)	43.0	(1.2)
Hong Kong	533.0	(3.7)	62.0	(0.7)	61.0	(0.6)	68.0	(0.7)	60.0	(0.8)	50.0	(1.1)
(Hungary)	532.0	(3.4)	62.0	(0.6)	62.0	(0.7)	66.0	(0.6)	59.0	(0.8)	50.0	(0.9)
Iceland	505.0	(3.3)	55.0	(0.7)	55.0	(0.7)	60.0	(0.8)	52.0	(0.7)	47.0	(1.2)
Iran	416.0	(3.9)	40.0	(0.7)	38.0	(0.7)	44.0	(0.7)	40.0	(0.9)	26.0	(0.9)
Ireland	539.0	(3.3)	61.0	(0.6)	60.0	(0.8)	66.0	(0.6)	57.0	(0.7)	55.0	(0.9)
(Israel)	505.0	(3.6)	57.0	(0.8)	51.0	(0.8)	61.0	(0.9)	55.0	(0.9)	51.0	(1.3)
Japan	574.0	(1.8)	70.0	(0.3)	66.0	(0.4)	73.0	(0.3)	70.0	(0.4)	62.0	(0.6)
Kuwait	401.0	(3.1)	39.0	(0.5)	36.0	(0.6)	45.0	(0.6)	37.0	(0.5)	25.0	(0.7)
(Latvia (LSS))	512.0	(4.9)	56.0	(0.8)	57.0	(1.0)	60.0	(0.8)	54.0	(0.9)	46.0	(1.2)
(Netherlands)	557.0	(3.1)	67.0	(0.5)	61.0	(0.6)	73.0	(0.5)	65.0	(0.6)	61.0	(0.9)
New Zealand	531.0	(4.9)	60.0	(0.9)	57.0	(0.9)	66.0	(0.9)	57.0	(1.1)	54.0	(1.2)
Norway	530.0	(3.6)	60.0	(0.6)	60.0	(0.6)	67.0	(0.7)	55.0	(0.7)	53.0	(0.9)
Portugal	480.0	(4.0)	50.0	(0.7)	50.0	(0.8)	54.0	(0.8)	49.0	(0.9)	39.0	(1.0)
Scotland	536.0	(4.2)	60.0	(0.8)	58.0	(0.9)	65.0	(0.8)	57.0	(0.8)	53.0	(1.2)
Singapore	547.0	(5.0)	64.0	(0.8)	58.0	(0.8)	70.0	(0.8)	64.0	(0.8)	53.0	(1.1)
(Slovenia)	546.0	(3.3)	64.0	(0.7)	64.0	(0.7)	68.0	(0.7)	61.0	(0.8)	54.0	(0.8)
South Korea	597.0	(1.9)	74.0	(0.4)	72.0	(0.5)	76.0	(0.4)	75.0	(0.5)	70.0	(0.8)
(Thailand)	473.0	(4.9)	49.0	(0.9)	48.0	(0.9)	52.0	(0.8)	46.0	(1.0)	48.0	(1.4)
United States	565.0	(3.1)	66.0	(0.5)	64.0	(0.7)	71.0	(0.6)	60.0	(0.6)	65.0	(0.8)

TIMSS = Third International Mathematics and Science Study

NOTE: Standard errors are shown in parentheses. Countries not meeting sampling or other guidelines are shown in parentheses.

SOURCES: Mullis, I., M. Martin, A. Beaton, E. Gonzalez, D. Kelly, and T. Smith, 1997. *Mathematics Achievement in the Primary School Years: IEA's Third International Mathematics and Science Study (TIMSS).* Chestnut Hill, MA: Boston College, TIMSS International Study Center.

See figure 5-8 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 5-14.
Overall mean and average percentage correct on grade 4 TIMSS mathematics assessment, by country and content area: 1994–95

Country	Mean		Percentage correct: All mathematics content areas		Whole numbers		Fractions and proportionality		Measurement, estimation, and probability		Data representation, analysis, and probability		Geometry		Patterns, relations, and functions	
All countries	529.0	(5.1)	59.0	(0.2)	67.0	(0.2)	49.0	(0.2)	56.0	(0.2)	62.0	(0.2)	64.0	(0.2)	60.0	(0.2)
(Australia)	546.0	(3.1)	63.0	(0.6)	67.0	(0.6)	51.0	(0.7)	60.0	(0.7)	67.0	(0.8)	74.0	(0.7)	64.0	(0.9)
(Austria)	559.0	(3.1)	65.0	(0.7)	74.0	(0.8)	51.0	(0.8)	69.0	(0.8)	66.0	(1.1)	67.0	(0.8)	64.0	(1.1)
Canada	532.0	(3.3)	60.0	(1.0)	68.0	(0.9)	48.0	(1.0)	54.0	(1.1)	68.0	(1.4)	72.0	(1.4)	62.0	(1.5)
Cyprus	502.0	(3.1)	54.0	(0.6)	65.0	(0.7)	48.0	(0.7)	48.0	(0.8)	52.0	(0.9)	53.0	(0.9)	55.0	(1.1)
Czech Republic	567.0	(3.3)	66.0	(0.6)	75.0	(0.6)	53.0	(0.8)	68.0	(0.7)	67.0	(0.9)	71.0	(0.7)	67.0	(0.9)
(England and Wales)	513.0	(3.2)	57.0	(0.7)	58.0	(0.7)	45.0	(0.8)	52.0	(0.7)	64.0	(0.9)	74.0	(0.8)	55.0	(1.0)
Greece	492.0	(4.4)	51.0	(0.9)	62.0	(1.0)	42.0	(1.1)	48.0	(1.0)	50.0	(1.2)	53.0	(1.2)	47.0	(1.2)
Hong Kong	587.0	(4.3)	73.0	(0.9)	79.0	(0.9)	66.0	(1.0)	69.0	(0.9)	76.0	(1.0)	74.0	(0.8)	73.0	(1.2)
(Hungary)	548.0	(3.7)	64.0	(0.8)	76.0	(0.7)	49.0	(0.9)	64.0	(0.9)	60.0	(1.0)	66.0	(0.8)	69.0	(1.1)
Iceland	474.0	(2.7)	50.0	(0.8)	56.0	(0.9)	36.0	(1.0)	44.0	(0.9)	58.0	(1.2)	63.0	(1.0)	48.0	(1.4)
Iran	429.0	(4.0)	38.0	(0.9)	51.0	(1.2)	32.0	(1.0)	36.0	(0.9)	23.0	(0.9)	42.0	(0.9)	40.0	(1.4)
Ireland	550.0	(3.4)	63.0	(0.8)	70.0	(0.8)	58.0	(1.0)	56.0	(0.9)	69.0	(0.9)	66.0	(0.8)	64.0	(1.0)
(Israel)	531.0	(3.5)	59.0	(1.0)	71.0	(1.0)	48.0	(1.1)	54.0	(1.0)	64.0	(1.2)	62.0	(1.0)	60.0	(1.5)
Japan	597.0	(2.1)	74.0	(0.4)	82.0	(0.4)	65.0	(0.6)	72.0	(0.5)	79.0	(0.5)	72.0	(0.6)	76.0	(0.6)
(Kuwait)	400.0	(2.8)	32.0	(0.5)	36.0	(0.5)	25.0	(0.5)	35.0	(0.6)	26.0	(0.6)	36.0	(0.6)	33.0	(1.0)
(Latvia (LSS))	525.0	(4.8)	59.0	(1.0)	68.0	(0.9)	44.0	(1.3)	60.0	(1.0)	54.0	(1.3)	67.0	(1.0)	65.0	(1.2)
(Netherlands)	577.0	(3.4)	69.0	(0.7)	75.0	(0.8)	60.0	(0.9)	70.0	(0.8)	75.0	(0.9)	71.0	(0.8)	65.0	(1.1)
New Zealand	499.0	(4.3)	53.0	(1.0)	57.0	(1.0)	41.0	(1.1)	49.0	(1.1)	61.0	(1.3)	66.0	(1.1)	52.0	(1.2)
Norway	502.0	(3.0)	53.0	(0.7)	61.0	(0.8)	38.0	(0.7)	56.0	(0.7)	59.0	(0.9)	58.0	(0.9)	50.0	(1.2)
Portugal	475.0	(3.5)	48.0	(0.7)	57.0	(0.8)	38.0	(0.7)	49.0	(0.8)	43.0	(1.1)	52.0	(1.0)	47.0	(1.1)
Scotland	520.0	(3.9)	58.0	(0.8)	61.0	(0.8)	46.0	(1.0)	53.0	(0.9)	66.0	(1.0)	72.0	(0.8)	57.0	(1.0)
Singapore	625.0	(5.3)	76.0	(0.8)	83.0	(0.7)	74.0	(1.0)	67.0	(1.0)	81.0	(0.8)	72.0	(0.8)	76.0	(0.9)
(Slovenia)	552.0	(3.2)	64.0	(0.6)	74.0	(0.6)	50.0	(0.9)	64.0	(0.9)	64.0	(1.0)	72.0	(0.8)	68.0	(0.8)
South Korea	611.0	(2.1)	76.0	(0.4)	88.0	(0.3)	65.0	(0.5)	72.0	(0.5)	80.0	(0.6)	72.0	(0.6)	83.0	(0.7)
(Thailand)	490.0	(4.7)	50.0	(1.1)	58.0	(1.3)	44.0	(1.0)	44.0	(1.0)	56.0	(1.5)	53.0	(1.2)	50.0	(1.3)
United States	545.0	(3.0)	63.0	(0.6)	71.0	(0.7)	51.0	(0.8)	53.0	(0.6)	73.0	(0.9)	71.0	(0.7)	66.0	(0.9)

TIMSS = Third International Mathematics and Science Study

NOTE: Standard errors are shown in parentheses. Countries not meeting sampling or other guidelines are shown in parentheses.

SOURCES: Mullis, I., M. Martin, A. Beaton, E. Gonzalez, D. Kelly, and T. Smith, 1997. *Mathematics Achievement in the Primary School Years: IEA's Third International Mathematics and Science Study (TIMSS).* Chestnut Hill, MA: Boston College, TIMSS International Study Center.

See figure 5-8 in Volume 1.

Appendix table 5-15.
Overall mean and average percentage correct on grade 8 TIMSS science assessment, by country and content area: 1994–95

Country	Mean		Percentage correct: All science content areas		Earth sciences		Life sciences		Physics		Chemistry		Environmental issues/nature of science	
All countries	516.0	NR	56.0	(0.1)	55.0	(0.1)	59.0	(0.1)	55.0	(0.1)	51.0	(0.2)	53.0	(0.2)
(Australia)	545.0	(3.9)	60.0	(0.7)	57.0	(0.8)	63.0	(0.8)	60.0	(0.7)	54.0	(0.9)	62.0	(1.0)
(Austria)	558.0	(3.7)	61.0	(0.7)	62.0	(0.8)	65.0	(0.7)	62.0	(0.7)	58.0	(1.1)	55.0	(0.9)
(Belgium (Flemish))	550.0	(4.2)	60.0	(1.1)	62.0	(1.2)	64.0	(1.1)	61.0	(1.1)	51.0	(1.3)	58.0	(1.5)
(Belgium (French))	471.0	(2.8)	50.0	(0.7)	50.0	(0.9)	55.0	(0.9)	51.0	(0.7)	41.0	(0.8)	46.0	(1.0)
(Bulgaria)	565.0	(5.3)	62.0	(1.0)	58.0	(1.2)	64.0	(1.0)	60.0	(1.0)	65.0	(1.7)	59.0	(1.5)
Canada	531.0	(2.6)	59.0	(0.5)	58.0	(0.6)	62.0	(0.6)	59.0	(0.4)	52.0	(0.7)	61.0	(0.7)
(Colombia)	411.0	(4.1)	39.0	(0.8)	37.0	(0.8)	44.0	(0.9)	37.0	(0.8)	32.0	(1.0)	40.0	(1.1)
Cyprus	463.0	(1.9)	47.0	(0.4)	46.0	(0.6)	49.0	(0.5)	46.0	(0.4)	45.0	(0.6)	46.0	(0.8)
Czech Republic	574.0	(4.3)	64.0	(0.8)	63.0	(1.2)	69.0	(0.8)	64.0	(0.7)	60.0	(1.2)	59.0	(1.1)
(Denmark)	478.0	(3.1)	51.0	(0.6)	49.0	(0.7)	56.0	(0.7)	53.0	(0.7)	41.0	(0.8)	47.0	(1.0)
(England and Wales)	552.0	(3.3)	61.0	(0.6)	59.0	(0.8)	64.0	(0.8)	62.0	(0.6)	55.0	(0.8)	65.0	(1.0)
France	498.0	(2.5)	54.0	(0.6)	55.0	(0.8)	56.0	(0.8)	54.0	(0.5)	47.0	(0.9)	53.0	(0.9)
(Germany)	531.0	(4.8)	58.0	(1.0)	57.0	(1.0)	63.0	(1.1)	57.0	(1.0)	54.0	(1.3)	51.0	(1.3)
(Greece)	497.0	(2.2)	52.0	(0.5)	49.0	(0.6)	54.0	(0.6)	53.0	(0.5)	51.0	(0.5)	51.0	(1.0)
Hong Kong	522.0	(4.7)	58.0	(1.0)	54.0	(1.0)	61.0	(1.0)	58.0	(0.9)	55.0	(1.0)	55.0	(1.3)
Hungary	554.0	(2.8)	61.0	(0.6)	60.0	(0.8)	65.0	(0.7)	60.0	(0.6)	60.0	(0.8)	53.0	(0.8)
Iceland	494.0	(4.0)	52.0	(0.9)	50.0	(1.2)	58.0	(1.0)	53.0	(0.9)	42.0	(0.8)	49.0	(1.0)
Iran	470.0	(2.4)	47.0	(0.6)	45.0	(0.6)	49.0	(0.6)	48.0	(0.7)	52.0	(0.8)	39.0	(1.1)
Ireland	538.0	(4.5)	58.0	(0.9)	61.0	(1.0)	60.0	(1.1)	56.0	(0.8)	54.0	(1.0)	60.0	(1.1)
(Israel)	524.0	(5.7)	57.0	(1.1)	55.0	(1.1)	61.0	(1.1)	57.0	(1.1)	53.0	(1.5)	52.0	(1.6)
Japan	571.0	(1.6)	65.0	(0.3)	61.0	(0.4)	71.0	(0.4)	67.0	(0.3)	61.0	(0.5)	60.0	(0.7)
(Kuwait)	430.0	(3.7)	43.0	(0.9)	43.0	(1.0)	45.0	(1.1)	43.0	(0.7)	40.0	(1.5)	39.0	(1.3)
(Latvia (LSS))	485.0	(2.7)	50.0	(0.6)	48.0	(0.8)	53.0	(0.7)	51.0	(0.7)	48.0	(0.8)	47.0	(1.0)
(Lithuania)	476.0	(3.4)	49.0	(0.7)	46.0	(0.9)	52.0	(0.9)	51.0	(0.7)	48.0	(0.9)	40.0	(1.0)
(Netherlands)	560.0	(5.0)	62.0	(1.0)	61.0	(1.4)	67.0	(1.4)	63.0	(0.9)	52.0	(0.9)	65.0	(1.6)
New Zealand	525.0	(4.4)	58.0	(0.8)	56.0	(0.9)	60.0	(1.0)	58.0	(0.7)	53.0	(1.1)	59.0	(1.2)
Norway	527.0	(1.9)	58.0	(0.4)	61.0	(0.6)	61.0	(0.5)	57.0	(0.4)	49.0	(0.6)	55.0	(0.8)
Portugal	480.0	(2.3)	50.0	(0.6)	50.0	(0.7)	53.0	(0.6)	48.0	(0.5)	50.0	(0.9)	45.0	(0.8)
(Romania)	486.0	(4.7)	50.0	(0.8)	49.0	(1.0)	55.0	(1.0)	49.0	(0.8)	46.0	(1.0)	42.0	(1.0)
Russian Federation	538.0	(4.0)	58.0	(0.8)	58.0	(0.8)	62.0	(0.7)	57.0	(0.9)	57.0	(1.3)	50.0	(0.8)
(Scotland)	517.0	(5.1)	55.0	(1.0)	52.0	(1.0)	57.0	(1.1)	57.0	(0.8)	51.0	(1.3)	57.0	(1.4)
Singapore	607.0	(5.5)	70.0	(1.0)	65.0	(1.1)	72.0	(1.0)	69.0	(0.8)	69.0	(1.2)	74.0	(1.1)
Slovak Republic	544.0	(3.2)	59.0	(0.6)	60.0	(0.7)	60.0	(0.6)	61.0	(0.6)	57.0	(0.8)	53.0	(0.9)
(Slovenia)	560.0	(2.5)	62.0	(0.5)	64.0	(0.7)	65.0	(0.6)	61.0	(0.6)	56.0	(0.9)	59.0	(0.9)
(South Africa)	326.0	(6.6)	27.0	(1.3)	26.0	(1.1)	27.0	(1.3)	27.0	(1.4)	26.0	(1.4)	26.0	(1.3)
South Korea	565.0	(1.9)	66.0	(0.3)	63.0	(0.5)	70.0	(0.4)	65.0	(0.5)	63.0	(0.6)	64.0	(0.8)
Spain	517.0	(1.7)	56.0	(0.4)	57.0	(0.5)	58.0	(0.5)	55.0	(0.4)	51.0	(0.7)	53.0	(0.6)
Sweden	535.0	(3.0)	59.0	(0.6)	62.0	(0.7)	63.0	(0.7)	57.0	(0.5)	56.0	(0.7)	52.0	(0.8)
Switzerland	522.0	(2.5)	56.0	(0.5)	58.0	(0.6)	59.0	(0.6)	58.0	(0.5)	50.0	(0.7)	51.0	(0.8)
(Thailand)	525.0	(3.7)	57.0	(0.9)	56.0	(1.0)	66.0	(0.9)	54.0	(0.7)	43.0	(1.2)	62.0	(1.1)
United States	534.0	(4.7)	58.0	(1.0)	58.0	(1.0)	63.0	(1.1)	56.0	(0.8)	53.0	(1.2)	61.0	(1.0)

NR = not reported; TIMSS = Third International Mathematics and Science Study

NOTE: Standard errors are shown in parentheses. Countries not meeting sampling or other guidelines are shown in parentheses.

SOURCE: Beaton, A., M. Martin, I. Mullis, E. Gonzalez, T. Smith, and D. Kelly. 1996. *Science Achievement in the Middle School Years: IEA's Third International Mathematics and Science Study (TIMSS).* Chestnut Hill, MA: Boston College, TIMSS International Study Center.

See figure 5-9 in Volume 1.

Appendix table 5-16.
Overall mean and average percentage correct on grade 8 TIMSS mathematics assessment, by country and content area: 1994–95

Country	Mean		Percentage correct: All mathematics content areas		Fractions and number sense		Geometry		Algebra		Data representation, analysis, and probability		Measurement		Proportionality	
All countries	513.0	NR	55.0	(0.1)	58.0	(0.1)	56.0	(0.1)	52.0	(0.2)	62.0	(0.1)	51.0	(0.1)	45.0	(0.2)
(Australia)	530.0	(4.0)	58.0	(0.9)	61.0	(0.9)	57.0	(1.0)	55.0	(1.0)	67.0	(0.8)	54.0	(1.0)	47.0	(0.9)
(Austria)	539.0	(3.0)	62.0	(0.8)	66.0	(0.8)	57.0	(1.0)	59.0	(0.8)	68.0	(0.8)	62.0	(1.0)	49.0	(0.9)
(Belgium (Flemish))	565.0	(5.7)	66.0	(1.4)	71.0	(1.2)	64.0	(1.5)	63.0	(1.7)	73.0	(1.3)	60.0	(1.3)	53.0	(1.8)
(Belgium (French))	526.0	(3.4)	59.0	(0.9)	62.0	(1.0)	58.0	(1.0)	53.0	(1.1)	68.0	(1.0)	56.0	(1.0)	48.0	(0.9)
(Bulgaria)	540.0	(6.3)	60.0	(1.2)	60.0	(1.4)	65.0	(1.3)	62.0	(1.5)	62.0	(1.1)	54.0	(1.6)	47.0	(1.5)
Canada	527.0	(2.4)	59.0	(0.5)	64.0	(0.6)	58.0	(0.6)	54.0	(0.7)	69.0	(0.5)	51.0	(0.7)	48.0	(0.7)
(Colombia)	385.0	(3.4)	29.0	(0.8)	31.0	(0.9)	29.0	(0.9)	28.0	(0.9)	37.0	(1.0)	25.0	(1.5)	23.0	(0.9)
Cyprus	474.0	(1.9)	48.0	(0.5)	50.0	(0.6)	47.0	(0.6)	48.0	(0.7)	53.0	(0.6)	44.0	(0.9)	40.0	(0.7)
Czech Republic	564.0	(4.9)	66.0	(1.1)	69.0	(1.1)	66.0	(1.1)	65.0	(1.3)	68.0	(0.9)	62.0	(1.2)	52.0	(1.3)
(Denmark)	502.0	(2.8)	52.0	(0.7)	53.0	(0.9)	54.0	(0.9)	45.0	(0.7)	67.0	(0.9)	49.0	(1.0)	41.0	(0.8)
(England and Wales)	506.0	(2.6)	53.0	(0.7)	54.0	(0.8)	54.0	(1.0)	49.0	(0.9)	66.0	(0.7)	50.0	(0.9)	41.0	(1.1)
France	538.0	(2.9)	61.0	(0.8)	64.0	(0.8)	66.0	(0.8)	54.0	(1.0)	71.0	(0.8)	57.0	(0.9)	49.0	(0.9)
(Germany)	509.0	(4.5)	54.0	(1.1)	58.0	(1.1)	51.0	(1.4)	48.0	(1.3)	64.0	(1.2)	51.0	(1.1)	42.0	(1.3)
(Greece)	484.0	(3.1)	49.0	(0.7)	53.0	(0.8)	51.0	(0.7)	46.0	(0.8)	56.0	(0.8)	43.0	(0.9)	39.0	(1.1)
Hong Kong	588.0	(6.5)	70.0	(1.4)	72.0	(1.4)	73.0	(1.5)	70.0	(1.5)	72.0	(1.3)	65.0	(1.7)	62.0	(1.4)
Hungary	537.0	(3.2)	62.0	(0.7)	65.0	(0.8)	60.0	(0.8)	63.0	(0.9)	66.0	(0.7)	56.0	(0.8)	47.0	(0.9)
Iceland	487.0	(4.5)	50.0	(1.1)	54.0	(1.2)	51.0	(1.4)	40.0	(1.3)	63.0	(1.1)	45.0	(1.4)	38.0	(1.4)
Iran	428.0	(2.2)	38.0	(0.6)	39.0	(0.6)	43.0	(0.8)	37.0	(0.8)	41.0	(0.6)	29.0	(1.2)	36.0	(0.8)
Ireland	527.0	(5.1)	59.0	(1.2)	65.0	(1.2)	51.0	(1.3)	53.0	(1.3)	69.0	(1.1)	53.0	(1.3)	51.0	(1.2)
(Israel)	522.0	(6.2)	57.0	(1.3)	60.0	(1.4)	57.0	(1.4)	61.0	(1.6)	63.0	(1.3)	48.0	(1.6)	43.0	(1.6)
Japan	605.0	(1.9)	73.0	(0.4)	75.0	(0.4)	80.0	(0.4)	72.0	(0.6)	78.0	(0.4)	67.0	(0.5)	61.0	(0.5)
(Kuwait)	392.0	(2.5)	30.0	(0.7)	27.0	(0.8)	38.0	(1.0)	30.0	(1.0)	38.0	(1.0)	23.0	(1.0)	21.0	(0.7)
(Latvia (LSS))	493.0	(3.1)	51.0	(0.8)	53.0	(0.9)	57.0	(0.8)	51.0	(0.9)	56.0	(0.8)	47.0	(0.9)	39.0	(0.9)
(Lithuania)	477.0	(3.5)	48.0	(0.9)	51.0	(1.0)	53.0	(1.1)	47.0	(1.2)	52.0	(1.0)	43.0	(0.9)	35.0	(0.9)
(Netherlands)	541.0	(6.7)	60.0	(1.6)	62.0	(1.6)	59.0	(1.8)	53.0	(1.6)	72.0	(1.7)	57.0	(1.6)	51.0	(1.9)
New Zealand	508.0	(4.5)	54.0	(1.0)	57.0	(1.1)	54.0	(1.1)	49.0	(1.1)	66.0	(1.0)	48.0	(1.2)	42.0	(1.0)
Norway	503.0	(2.2)	54.0	(0.5)	58.0	(0.6)	51.0	(0.6)	45.0	(0.7)	66.0	(0.6)	51.0	(0.6)	40.0	(0.6)
Portugal	454.0	(2.5)	43.0	(0.7)	44.0	(0.7)	44.0	(0.8)	40.0	(0.8)	54.0	(0.7)	39.0	(0.7)	32.0	(0.8)
(Romania)	482.0	(4.0)	49.0	(1.0)	48.0	(1.0)	52.0	(0.9)	52.0	(1.3)	49.0	(1.0)	48.0	(1.1)	42.0	(1.2)
Russian Federation	535.0	(5.3)	60.0	(1.3)	62.0	(1.2)	63.0	(1.4)	63.0	(1.5)	60.0	(1.2)	56.0	(1.5)	48.0	(1.5)
(Scotland)	498.0	(5.5)	52.0	(1.3)	53.0	(1.3)	52.0	(1.4)	46.0	(1.5)	65.0	(1.3)	48.0	(1.6)	40.0	(1.4)
Singapore	643.0	(4.9)	79.0	(0.9)	84.0	(0.8)	76.0	(1.0)	76.0	(1.1)	79.0	(0.8)	77.0	(1.0)	75.0	(1.0)
Slovak Republic	547.0	(3.3)	62.0	(0.8)	66.0	(0.8)	63.0	(0.8)	62.0	(0.9)	62.0	(0.7)	60.0	(0.9)	49.0	(1.0)
(Slovenia)	541.0	(3.1)	61.0	(0.7)	63.0	(0.7)	60.0	(0.9)	61.0	(0.8)	66.0	(0.7)	59.0	(0.9)	49.0	(0.8)
(South Africa)	354.0	(4.4)	24.0	(1.1)	26.0	(1.4)	24.0	(1.0)	23.0	(1.1)	26.0	(1.2)	18.0	(1.1)	21.0	(0.9)
South Korea	607.0	(2.4)	72.0	(0.5)	74.0	(0.5)	75.0	(0.6)	69.0	(0.6)	78.0	(0.6)	66.0	(0.7)	62.0	(0.6)
Spain	487.0	(2.0)	51.0	(0.5)	52.0	(0.5)	49.0	(0.6)	54.0	(0.8)	60.0	(0.7)	44.0	(0.7)	40.0	(0.8)
Sweden	519.0	(3.0)	56.0	(0.7)	62.0	(0.8)	48.0	(0.7)	44.0	(0.9)	70.0	(0.7)	56.0	(0.9)	44.0	(0.9)
Switzerland	545.0	(2.8)	62.0	(0.6)	67.0	(0.7)	60.0	(0.8)	53.0	(0.7)	72.0	(0.7)	61.0	(0.8)	52.0	(0.7)
(Thailand)	522.0	(5.7)	57.0	(1.4)	60.0	(1.5)	62.0	(1.3)	53.0	(1.7)	63.0	(1.1)	50.0	(1.4)	51.0	(1.5)
United States	500.0	(4.6)	53.0	(1.1)	59.0	(1.1)	48.0	(1.2)	51.0	(1.2)	65.0	(1.1)	40.0	(1.1)	42.0	(1.1)

NR = not reported; TIMSS = Third International Mathematics and Science Study

NOTE: Standard errors are shown in parentheses. Countries not meeting sampling or other guidelines are shown in parentheses.

SOURCE: Beaton, A., I. Mullis, M. Martin, E. Gonzalez, D. Kelly, and T. Smith. 1996. *Mathematics Achievement in the Primary School Years: IEA's Third International Mathematics and Science Study (TIMSS).* Chestnut Hill, MA: Boston College, TIMSS International Study Center.

See figure 5-9 in Volume 1.

Appendix table 5-17.
Mean and standard errors on final year of secondary school TIMSS mathematics and science general knowledge assessment, by country: 1994–95

Country	Mathematics	Science
(Australia)	522 (9.3)	527 (9.8)
(Austria)	518 (5.3)	520 (5.6)
(Canada)	519 (2.8)	532 (2.6)
(Cyprus)	446 (2.5)	448 (3.0)
Czech Republic	466 (12.3)	487 (8.8)
(Denmark)	547 (3.3)	509 (3.6)
(France)	523 (5.1)	487 (5.1)
(Germany)	495 (5.9)	497 (5.1)
Hungary	483 (3.2)	471 (3.0)
(Iceland)	534 (2.0)	549 (1.5)
(Italy)	476 (5.5)	475 (5.3)
(Lithuania)	469 (6.1)	461 (5.7)
(Netherlands)	560 (4.7)	558 (5.3)
New Zealand	522 (4.5)	529 (5.2)
(Norway)	528 (4.1)	544 (4.1)
(Russian Federation)	471 (6.2)	481 (5.7)
(Slovenia)	512 (8.3)	517 (8.2)
(South Africa)	356 (8.3)	349 (10.5)
Sweden	552 (4.3)	559 (4.4)
Switzerland	540 (5.8)	523 (5.3)
(United States)	461 (3.2)	480 (3.3)

NOTE: Standard errors are shown in parentheses. Countries not meeting sampling or other guidelines are shown in parentheses.

SOURCE: Mullis, I., M. Martin, A. Beaton, E. Gonzalez, D. Kelly, and T. Smith. 1998. *Mathematics and Science Achievement in the Final Year of Secondary School: IEA's Third International Mathematics Study (TIMSS).* Chestnut Hill, MA: Boston College, TIMSS International Study Center.

See figure 5-10 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 5-18.
Mean and standard errors on final year of secondary school TIMSS advanced mathematics and physics assessment, by country: 1994–95

Country	Advanced mathematics	Physics
Australia	525 (11.6)[a]	518 (6.2)[a]
Austria	436 (7.2)[a]	435 (6.4)[a]
Canada	509 (4.3)	485 (3.3)[a]
Cyprus	518 (4.3)[a]	494 (5.8)[a]
Czech Republic	469 (11.2)	451 (6.2)
Denmark	522 (3.4)[a]	534 (4.2)[a]
France	557 (3.9)	466 (3.8)
Germany	465 (5.6)[a]	522 (11.9)[a]
Greece	513 (6.0)	486 (5.6)
Italy	474 (9.6)[a]	NP
Latvia (LSS)	NP	488 (21.5)[a]
Lithuania	516 (2.6)[a]	NP
Norway	NP	581 (6.5)
Russian Federation	542 (9.2)[a]	545 (11.6)[a]
Slovenia	475 (9.2)[a]	523 (15.5)[a]
Sweden	512 (4.4)	573 (3.9)
Switzerland	533 (5.0)	488 (3.5)
United States	442 (5.9)[a]	423 (3.3)[a]

NP = Country was not assessed in this subject.

NOTE: Standard errors are shown in parentheses.

[a]Country did not satisfy one or more guidelines for sample participation rates or student sampling procedures.

SOURCE: Mullis, I., M. Martin, A. Beaton, E. Gonzalez, D. Kelly, and T. Smith. 1998. *Mathematics and Science Achievement in the Final Year of Secondary School: IEA's Third International Mathematics Study (TIMSS).* Chestnut Hill, MA: Boston College, TIMSS International Study Center.

See figures 5-11 and 5-12 in Volume 1.

Appendix table 5-19.
Percentage of students scoring in the top 10 percent on the TIMSS science and mathematics assessments, by country and grade: 1994–95

Country	Science				Mathematics			
	Grade 4		Grade 8		Grade 4		Grade 8	
Australia	14.0	(0.7)	16.0	(0.9)	12.0	(0.7)	11.0	(0.9)
Austria	10.0	(0.9)	16.0	(0.9)	11.0	(1.1)	11.0	(0.7)
Belgium (Flemish)		NP	10.0	(0.8)		NP	17.0	(1.2)
Belgium (French)		NP	1.0	(0.2)		NP	6.0	(0.6)
Bulgaria		NP	21.0	(1.4)		NP	16.0	(1.9)
Canada	9.0	(0.7)	9.0	(0.6)	7.0	(0.8)	7.0	(0.7)
Colombia		NP	0.0	(0.1)		NP	0.0	0.0
Cyprus	1.0	(0.1)	1.0	(0.2)	4.0	(0.5)	2.0	(0.3)
Czech Republic	11.0	(1.0)	19.0	(1.6)	15.0	(1.3)	18.0	(1.9)
Denmark		NP	2.0	(0.3)		NP	4.0	(0.5)
England and Wales	13.0	(1.0)	17.0	(0.9)	7.0	(0.7)	7.0	(0.6)
France		NP	1.0	(0.2)		NP	7.0	(0.8)
Germany		NP	11.0	(1.0)		NP	6.0	(0.7)
Greece	1.0	(0.2)	4.0	(0.4)	3.0	(0.5)	3.0	(0.4)
Hong Kong	4.0	(0.7)	7.0	(0.8)	18.0	(1.5)	27.0	(2.1)
Hungary	5.0	(0.6)	14.0	(0.8)	11.0	(1.1)	11.0	(0.8)
Iceland	3.0	(0.4)	2.0	(0.5)	1.0	(0.3)	1.0	(0.3)
Iran	0.0	(0.1)	1.0	(0.1)	0.0	(0.1)	0.0	0.0
Ireland	7.0	(0.6)	12.0	(0.9)	10.0	(0.7)	9.0	(1.0)
Israel	3.0	(0.5)	11.0	(1.2)	6.0	(0.7)	6.0	(0.9)
Japan	11.0	(0.6)	18.0	(0.6)	23.0	(0.9)	32.0	(0.8)
Kuwait	0.0	(0.1)	0.0	0.0	0.0	(0.1)	0.0	0.0
Latvia (LSS)	4.0	(1.2)	2.0	(0.3)	6.0	(1.3)	3.0	(0.5)
Lithuania		NP	1.0	(0.3)		NP	1.0	(0.3)
Netherlands	5.0	(0.6)	12.0	(1.1)	13.0	(1.1)	10.0	(1.6)
New Zealand	9.0	(0.9)	11.0	(0.9)	3.0	(0.7)	6.0	(0.8)
Norway	6.0	(0.6)	7.0	(0.5)	2.0	(0.3)	4.0	(0.4)
Portugal	1.0	(0.2)	1.0	(0.1)	1.0	(0.2)	0.0	(0.1)
Romania		NP	5.0	(0.6)		NP	3.0	(0.4)
Russian Federation		NP	11.0	(0.8)		NP	10.0	(0.7)
Scotland	9.0	(0.8)	9.0	(1.1)	6.0	(0.8)	5.0	(0.9)
Singapore	11.0	(1.5)	31.0	(2.3)	39.0	(2.3)	45.0	(2.5)
Slovak Republic		NP	12.0	(0.9)		NP	12.0	(1.0)
Slovenia	6.0	(0.7)	14.0	(0.9)	11.0	(0.9)	11.0	(0.7)
South Africa		NP	1.0	(0.2)		NP	0.0	0.0
South Korea	17.0	(0.9)	18.0	(0.8)	26.0	(1.2)	34.0	(1.1)
Spain		NP	4.0	(0.3)		NP	2.0	(0.2)
Sweden		NP	9.0	(0.6)		NP	5.0	(0.5)
Switzerland		NP	7.0	(0.6)		NP	11.0	(0.7)
Thailand	0.0	(0.1)	4.0	(0.5)	1.0	(0.2)	7.0	(1.2)
United States	16.0	(0.9)	13.0	(0.8)	9.0	(0.8)	5.0	(0.6)

NP = did not participate in grade 4 assessment

NOTE: Standard errors are shown in parentheses.

SOURCES: Beaton, A., M. Martin, I. Mullis, E. Gonzalez, T. Smith, and D. Kelly. 1996. *Mathematics Achievement in the Middle School Years: IEA's Third International Mathematics and Science Study (TIMSS).* Chestnut Hill, MA: Boston College, TIMSS International Study Center; Mullis, I., M. Martin, A. Beaton, E. Gonzalez, D. Kelly, and T. Smith. 1997. *Mathematics Achievement in the Primary School Years: IEA's Third International Mathematics and Science Study (TIMSS).* Chestnut Hill, MA: Boston College, TIMSS International Study Center.

See page 5-21 in Volume 1.

Appendix table 5-20.
TIMSS achievement means by subject and grade for selected countries: 1994–95

Grade and country	Mathematics	Science
Grade 4		
First in the World	591 (9.1)	611 (9.0)
United States.	545 (3.0)	565 (3.1)
International	529 (0.7)	524 (0.7)
Highest scoring country	Singapore 625 (5.3)	South Korea 597 (1.9)
Grade 8		
First in the World	587 (11.8)	584 (8.7)
United States.	500 (4.6)	534 (4.7)
International	513 (0.8)	516 (0.7)
Highest scoring country	Singapore 643 (4.9)	Singapore 607 (5.5)
Final Year (General Knowledge)		
First in the World	545 (3.5)	547 (3.9)
United States.	461 (3.2)	480 (3.3)
International	500 (1.3)	500 (1.3)
Highest scoring country	Netherlands 560 (4.7)	Sweden 559 (4.4)
Final Year (Advanced)		
First in the World	490 (4.4)	445 (3.3)
United States.	442 (5.9)	423 (3.3)
International	501 (1.8)	501 (1.8)
Highest scoring country	France 557 (3.9)	Norway 581 (6.5)

NOTE: Data from Third International Mathematics and Science Study (1994-95). The First in the World Consortium includes 20 Illinois elementary and secondary districts, composed of some 37,780 students. See <<http://www.ncrel.org/fitw/homepage.htm>> for a list of participating districts.

SOURCE: North Central Regional Educational Laboratory. Available from <<http://www.ncrel.org/>>. Accessed March 1999.

Science & Engineering Indicators - 2000

Appendix table 5-21.
Percentage of high school graduates earning credits in science courses, by gender: 1982, 1987, 1990, and 1994

Year of graduation and gender	Any science	Survey science	Biology	AP/honors biology	Chemistry	AP chemistry	Physics	AP/honors physics
1982 graduates								
All	96.5 (0.3)	62.1 (1.2)	76.6 (0.8)	9.7 (0.5)	31.1 (0.8)	2.9 (0.4)	14.4 (0.5)	1.1 (0.1)
Male	96.3 (0.3)	63.6 (1.4)	74.5 (0.9)	9.0 (0.5)	32.2 (1.2)	3.5 (0.5)	19.1 (1.0)	1.5 (0.2)
Female	96.7 (0.3)	60.8 (1.3)	78.6 (1.1)	10.3 (0.8)	30.2 (0.7)	2.4 (0.5)	10.2 (0.4)	0.7 (0.1)
1987 graduates								
All	99.1 (0.2)	61.3 (3.1)	87.9 (1.0)	9.5 (0.8)	43.8 (1.1)	3.3 (0.4)	19.3 (0.9)	1.7 (0.3)
Male	98.8 (0.2)	61.8 (3.0)	86.3 (1.2)	9.4 (0.8)	44.3 (1.3)	3.9 (0.5)	24.1 (1.0)	2.5 (0.4)
Female	99.3 (0.1)	60.7 (3.3)	89.5 (0.8)	9.6 (0.9)	43.2 (1.2)	2.7 (0.3)	14.7 (0.9)	0.9 (0.2)
1990 graduates								
All	99.4 (0.1)	68.1 (1.8)	91.1 (1.0)	10.1 (1.0)	48.9 (1.3)	3.5 (0.5)	21.6 (0.8)	2.0 (0.4)
Male	99.1 (0.3)	69.6 (1.9)	89.6 (1.1)	9.3 (1.0)	47.7 (1.4)	4.1 (0.5)	25.4 (0.9)	2.5 (0.5)
Female	99.7 (0.1)	66.7 (1.9)	92.4 (0.9)	10.8 (1.2)	50.0 (1.3)	2.9 (0.5)	18.0 (0.9)	1.6 (0.3)
1994 graduates								
All	99.6 (0.1)	71.1 (1.9)	93.4 (1.0)	11.9 (0.9)	55.8 (1.0)	3.9 (0.5)	24.7 (0.9)	2.7 (0.3)
Male	99.5 (0.1)	72.5 (2.0)	92.1 (1.1)	10.9 (0.9)	52.9 (1.1)	4.1 (0.6)	27.2 (1.0)	3.5 (0.4)
Female	99.8 (0.1)	69.8 (2.0)	94.7 (0.9)	12.8 (1.1)	58.6 (1.2)	3.7 (0.5)	22.3 (0.9)	2.0 (0.3)

AP = advanced placement

NOTE: Standard errors are shown in parentheses.

SOURCE: National Center for Education Statistics (NCES). 1998. *The 1994 High School Transcript Study: Comparative Data on Credits Earned and Demographics for 1994, 1990, 1987, and 1982 High School Graduates.* Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

See text table 5-5 in Volume 1.

Appendix table 5-22.
Percentage of high school graduates earning credits in mathematics courses, by gender: 1982, 1987, 1990, and 1994

Year of graduation and gender	Any mathematics	Basic math	General math	Applied math	Algebra 2	Geometry	Calculus	AP calculus	Advanced math- other
1982 graduates									
All	98.6 (0.1)	6.2 (0.5)	29.5 (1.1)	8.8 (0.4)	35.6 (0.8)	45.8 (0.8)	4.7 (0.4)	1.5 (0.3)	13.2 (0.8)
Male	98.9 (0.2)	7.4 (0.5)	32.3 (1.2)	10.0 (0.6)	35.9 (1.1)	45.4 (0.8)	5.2 (0.5)	1.6 (0.3)	14.8 (1.1)
Female	98.4 (0.2)	5.1 (0.7)	26.9 (1.2)	7.7 (0.6)	35.3 (0.9)	46.2 (1.2)	4.2 (0.4)	1.4 (0.3)	11.7 (0.7)
1987 graduates									
All	99.8 (0.1)	8.5 (0.7)	21.1 (1.3)	14.4 (1.0)	46.1 (1.6)	59.8 (1.0)	6.0 (0.4)	3.3 (0.4)	20.5 (1.1)
Male	99.8 (0.1)	9.2 (0.8)	23.1 (1.5)	15.3 (1.2)	44.8 (1.8)	58.9 (1.2)	7.4 (0.5)	3.8 (0.5)	22.2 (1.3)
Female	99.7 (0.1)	7.8 (0.8)	19.1 (1.1)	13.6 (1.0)	47.5 (1.7)	60.5 (1.0)	4.6 (0.4)	2.7 (0.4)	19.0 (1.2)
1990 graduates									
All	99.9 0.0	8.0 (0.7)	19.6 (1.5)	16.1 (1.2)	49.6 (1.3)	63.2 (1.4)	6.5 (0.5)	4.1 (0.4)	20.3 (1.2)
Male	99.9 (0.1)	8.9 (0.8)	21.6 (1.7)	17.0 (1.3)	47.7 (1.4)	62.1 (1.6)	7.5 (0.6)	5.0 (0.6)	21.4 (1.4)
Female	99.9 (0.1)	7.1 (0.7)	17.8 (1.4)	15.2 (1.2)	51.5 (1.5)	64.3 (1.4)	5.6 (0.4)	3.4 (0.4)	19.3 (1.1)
1994 graduates									
All	99.9 0.0	4.8 (0.5)	16.2 (1.0)	13.7 (0.9)	57.8 (1.4)	70.1 (1.4)	9.3 (0.6)	7.0 (0.5)	24.9 (0.9)
Male	99.9 0.0	5.8 (0.5)	18.2 (1.1)	14.8 (1.1)	54.4 (1.4)	68.0 (1.3)	9.5 (0.6)	7.2 (0.6)	24.2 (1.0)
Female	99.9 (0.1)	4.0 (0.4)	14.2 (1.0)	12.7 (0.9)	61.0 (1.5)	72.3 (1.3)	9.2 (0.6)	6.8 (0.6)	25.6 (1.0)

AP = advanced placement

NOTE: Standard errors are shown in parentheses.

SOURCE: National Center for Education Statistics (NCES). 1998. *The 1994 High School Transcript Study: Comparative Data on Credits Earned and Demographics for 1994, 1990, 1987, and 1982 High School Graduates.* Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

See figure 5-13 and text table 5-6 in Volume 1.

Appendix table 5-23.
Percentage of high school graduates earning credits in science courses, by race/ethnicity: 1982, 1987, 1990, and 1994

Year of graduation and gender	Any science	Survey science	Biology	AP/honors biology	Chemistry	AP chemistry	Physics	AP/honors physics
1982 graduates								
White	96.9 (0.3)	61.6 (1.4)	78.6 (1.0)	10.9 (0.7)	34.4 (0.9)	3.3 (0.5)	16.5 (0.6)	1.2 (0.2)
Asian/Pacific Islander	95.9 (1.3)	40.9 (5.1)	83.7 (2.2)	17.5 (2.9)	52.8 (4.4)	5.8 (1.3)	34.8 (3.4)	3.4 (1.0)
Black	97.1 (0.5)	67.8 (1.8)	72.9 (1.9)	6.0 (1.3)	22.3 (1.5)	1.6 (0.6)	7.6 (0.8)	0.9 (0.4)
Hispanic	93.5 (1.1)	63.3 (1.6)	68.6 (2.1)	4.8 (0.7)	15.6 (1.0)	1.4 (0.4)	5.6 (0.6)	0.4 (0.1)
American Indian/ Alaskan Native	91.6 (4.9)	58.1 (7.7)	67.4 (6.9)	3.2 (1.8)	26.2 (7.0)	0.9 (0.9)	8.2 (3.1)	0.0 (0.0)
1987 graduates								
White	99.2 (0.2)	60.7 (3.6)	88.8 (1.1)	9.6 (0.9)	46.7 (1.2)	3.4 (0.4)	20.6 (1.0)	1.7 (0.3)
Asian/Pacific Islander	99.6 (0.3)	44.8 (5.2)	92.1 (1.3)	23.6 (4.4)	70.2 (3.7)	15.4 (2.5)	46.9 (4.2)	6.2 (1.4)
Black	99.1 (0.3)	71.8 (3.8)	84.6 (1.8)	5.2 (0.7)	28.4 (1.8)	1.1 (0.3)	9.7 (1.1)	0.4 (0.1)
Hispanic	99.1 (0.3)	66.9 (3.2)	85.5 (1.5)	7.6 (1.1)	29.1 (1.5)	2.2 (0.6)	9.9 (1.1)	0.8 (0.3)
American Indian/ Alaskan Native	99.1 (0.7)	67.3 (3.3)	90.9 (1.9)	13.0 (3.6)	26.4 (2.0)	0.6 (0.3)	8.4 (2.4)	1.4 (0.5)
1990 graduates								
White	99.4 (0.2)	67.6 (2.0)	91.3 (1.1)	10.5 (1.0)	51.4 (1.4)	3.7 (0.6)	23.1 (0.9)	2.1 (0.4)
Asian/Pacific Islander	99.6 (0.2)	56.7 (7.1)	90.4 (2.8)	13.4 (4.0)	63.6 (4.0)	7.7 (1.9)	38.4 (3.5)	5.9 (2.6)
Black	99.5 (0.2)	75.3 (3.1)	91.1 (2.2)	7.7 (1.9)	40.0 (2.2)	2.5 (0.9)	14.5 (1.9)	0.7 (0.3)
Hispanic	99.1 (0.3)	72.0 (3.5)	90.1 (1.4)	6.7 (1.3)	38.1 (2.9)	1.1 (0.4)	13.2 (1.3)	1.0 (0.4)
American Indian/ Alaskan Native	98.7 (1.2)	69.4 (5.8)	89.4 (4.7)	3.8 (2.0)	34.9 (4.6)	4.4 (2.6)	14.5 (3.8)	0.5 (0.5)
1994 graduates								
White	99.8 (0.1)	72.3 (2.3)	94.3 (1.1)	12.5 (1.1)	58.4 (1.1)	4.3 (0.6)	26.3 (1.1)	2.8 (0.4)
Asian/Pacific Islander	99.4 (0.4)	62.0 (4.6)	91.5 (1.5)	18.2 (3.1)	69.2 (4.9)	7.7 (1.5)	44.4 (3.6)	6.7 (1.5)
Black	99.8 (0.1)	71.7 (3.5)	91.8 (1.5)	7.7 (1.1)	43.7 (2.6)	2.1 (0.7)	14.9 (1.2)	1.8 (0.3)
Hispanic	99.3 (0.2)	69.7 (4.0)	93.7 (0.7)	11.0 (1.2)	45.9 (3.5)	2.5 (0.6)	16.1 (1.6)	1.9 (0.5)
American Indian/ Alaskan Native	99.7 (0.3)	79.0 (5.2)	91.8 (2.1)	6.2 (3.2)	41.3 (5.6)	0.6 (0.6)	10.3 (3.0)	0.3 (0.3)

AP = advanced placement

NOTE: Standard errors are shown in parentheses.

SOURCE: National Center for Education Statistics (NCES). 1998. *The 1994 High School Transcript Study: Comparative Data on Credits Earned and Demographics for 1994, 1990, 1987, and 1982 High School Graduates.* Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

See figure 5-14 and text table 5-5 in Volume 1.

Appendix table 5-24.
Percentage of high school graduates earning credits in mathematics courses, by race/ethnicity: 1982, 1987, 1990, and 1994

Year of graduation and gender	Any mathematics	Basic math	General math	Applied math	Algebra 2	Geometry	Calculus	AP calculus	Advanced math- other
1982 graduates									
White	98.8 (0.2)	4.5 (0.4)	25.0 (1.1)	7.8 (0.6)	39.5 (0.9)	51.3 (1.0)	5.5 (0.4)	1.8 (0.3)	14.9 (0.9)
Asian/Pacific Islander	100.0 (0.0)	4.9 (1.6)	17.0 (3.5)	9.6 (2.1)	55.8 (4.2)	64.9 (4.7)	12.8 (2.7)	5.5 (1.7)	24.9 (3.1)
Black	99.3 (0.3)	13.6 (2.1)	46.6 (3.1)	13.3 (1.5)	24.2 (2.0)	29.3 (1.8)	1.3 (0.4)	0.3 (0.1)	6.2 (0.8)
Hispanic	97.2 (0.5)	9.4 (1.2)	43.2 (2.1)	11.2 (1.2)	20.1 (1.4)	25.7 (1.4)	1.7 (0.3)	0.4 (0.1)	8.0 (0.9)
American Indian/ Alaskan Native	99.6 (0.5)	7.4 (4.2)	41.4 (5.2)	7.3 (3.3)	19.1 (4.5)	33.5 (7.2)	4.0 (2.2)	0.1 (0.1)	7.4 (2.9)
1987 graduates									
White	99.8 (0.1)	6.5 (0.6)	18.1 (1.3)	14.3 (1.3)	50.7 (1.6)	63.1 (1.2)	5.7 (0.4)	2.7 (0.3)	21.6 (1.2)
Asian/Pacific Islander	100.0 (0.0)	4.9 (1.3)	14.2 (3.1)	9.7 (1.3)	66.1 (4.7)	81.4 (2.5)	29.6 (4.1)	23.7 (4.7)	48.5 (5.0)
Black	99.8 (0.1)	17.1 (2.7)	37.9 (2.7)	18.4 (1.8)	30.0 (1.7)	42.3 (2.0)	2.2 (0.3)	1.4 (0.3)	9.8 (0.9)
Hispanic	99.9 (0.1)	21.0 (1.9)	29.3 (3.5)	15.6 (1.8)	27.6 (2.0)	39.7 (1.7)	3.6 (0.7)	2.6 (0.6)	11.1 (1.2)
American Indian/ Alaskan Native	99.3 (0.8)	7.2 (1.6)	37.2 (4.7)	29.9 (4.4)	23.8 (2.5)	43.5 (4.0)	0.4 (0.4)	0.4 (0.4)	10.2 (1.6)
1990 graduates									
White	99.9 (0.1)	5.8 (0.6)	17.5 (1.8)	15.0 (1.1)	53.1 (1.6)	65.5 (1.5)	6.9 (0.5)	4.2 (0.5)	22.2 (1.3)
Asian/Pacific Islander	99.9 (0.2)	8.4 (2.6)	14.7 (1.8)	13.0 (3.5)	60.9 (5.0)	70.7 (2.8)	18.5 (3.3)	15.6 (2.8)	36.3 (4.8)
Black	99.9 (0.1)	14.3 (1.9)	28.4 (2.3)	21.3 (2.7)	40.6 (2.8)	55.8 (2.6)	2.7 (0.5)	1.2 (0.3)	9.7 (1.4)
Hispanic	99.8 (0.1)	15.3 (2.7)	28.6 (3.0)	19.1 (3.7)	35.1 (2.6)	53.2 (2.8)	3.8 (0.7)	3.0 (0.6)	11.1 (1.1)
American Indian/ Alaskan Native	100.0 (0.0)	11.1 (3.0)	28.9 (7.0)	20.7 (4.6)	47.1 (5.4)	54.8 (3.1)	4.1 (2.7)	2.9 (2.5)	16.3 (4.0)
1994 graduates									
White	99.9 (0.0)	3.7 (0.4)	14.5 (1.1)	13.2 (1.1)	61.6 (1.5)	72.4 (1.4)	9.6 (0.7)	7.3 (0.7)	26.5 (1.1)
Asian/Pacific Islander	100.0 (0.0)	4.0 (1.0)	17.5 (2.8)	11.5 (3.2)	66.2 (5.0)	75.7 (3.8)	23.6 (3.2)	21.1 (2.9)	40.6 (4.3)
Black	100.0 (0.0)	7.3 (1.3)	27.1 (2.9)	17.5 (2.0)	43.9 (2.4)	58.1 (2.9)	3.8 (0.6)	2.0 (0.4)	13.5 (1.1)
Hispanic	99.9 (0.1)	8.4 (1.1)	16.2 (2.1)	16.4 (2.1)	49.6 (2.1)	68.8 (1.8)	6.0 (0.6)	4.6 (0.5)	17.4 (1.5)
American Indian/ Alaskan Native	100.0 (0.0)	5.4 (1.4)	19.1 (3.5)	13.8 (2.9)	42.2 (7.0)	60.0 (4.3)	3.8 (1.2)	2.2 (1.4)	11.9 (3.3)

AP = advanced placement

NOTE: Standard errors are shown in parentheses.

SOURCE: National Center for Education Statistics (NCES). 1998. *The 1994 High School Transcript Study: Comparative Data on Credits Earned and Demographics for 1994, 1990, 1987, and 1982 High School Graduates.* Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

See figure 5-15 and text table 5-6 in Volume 1.

Appendix table 5-25.
Percentage of public schools and instructional rooms having access to the Internet, by school characteristics: 1994, 1997, and 1998

School characteristic	Schools			Instructional rooms		
	1994	1997	1998	1994	1997	1998
All public schools	35	78	89	3	27	51
Instructional level[a]						
Elementary	30	75	88	3	24	51
Secondary	49	89	94	4	32	52
Metropolitan status						
City	40	74	92	4	20	47
Urban fringe	38	78	85	4	29	50
Town	29	84	90	3	34	55
Rural	35	79	92	3	30	57
Percent minority enrollment						
Less than 6 percent	38	84	91	6	37	57
6 to 20 percent	38	87	93	4	35	59
21 to 49 percent	38	73	82	4	22	52
50 percent or more	27	63	82	3	13	37
Percent of students eligible for free or reduced-price school lunch						
Less than 11 percent	40	88	87	4	36	62
11 to 30 percent	39	83	94	4	32	53
31 to 70 percent	33	78	91	3	27	52
71 percent or more	19	63	80	2	14	39

[a]Data for combined schools are included in the totals and in analyses by other school characteristics but are not shown separately.

SOURCES: National Center for Education Statistics (NCES). 1995. *Advanced Telecommunications in U.S. Public Schools, K-12.* NCES 95-731; 1996. *Advanced Telecommunications in U.S. Public Elementary and Secondary Schools, 1995.* NCES 96-854; 1997. *Advanced Telecommunications in U.S. Public Elementary and Secondary Schools, Fall 1996.* NCES 97-944; 1998. *Internet Access in Public Schools.* NCES 98-031. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement; and data from the Fast Response Survey System, "Survey on Internet Access in U.S. Public Schools, Fall 1998," FRSS 69, 1998.

See figure 5-18 in Volume 1.

Appendix table 5-26.
Teachers' computer use practice by subject and level for U.S. teachers in grades 4 to 12 (not including physical education): 1997–98

Subject and level taught	Have students use computers in the selected class	Students use computers in other classes, not this class	Use computers only to prepare for class or other activities	Do not use computers but have in the past	Never used computers in teaching or other activities	Total
All teachers	60%	11%	23%	4%	3%	100%
Elementary self-contained	73	15	9	2	2	100
Elementary other	64	14	14	4	5	100
Secondary						
English	65	10	20	4	1	100
Science	60	6	30	3	1	100
Social studies	50	6	32	8	4	100
Foreign language	38	17	38	0	8	100
Math	37	12	38	7	6	100
Mixed and other academic	72	15	11	1	1	100
Computer	94	4	1	0	0	100
Business	82	11	0	4	3	100
Vocational	73	6	20	1	0	100
Fine arts	36	17	39	4	4	100
Non-academic other	40	11	43	2	5	100

SOURCE: Ravitz, J., H.J. Becker, and Y. Wong. 1999. "Computer and Software Use by Teachers." *Teaching, Learning, and Computering 1998*, Report No. 3. November.

See page 5-31 in Volume 1.

Appendix table 6-1.
Total, federally funded, and non-federally funded academic R&D, by basic research, applied research, and development: 1953–98
(Percentages)

Year	Academic R&D				Federally supported academic R&D				Non-federally supported academic R&D			
	Total academic	Basic research	Applied research	Development	Total academic	Basic research	Applied research	Development	Total academic	Basic research	Applied research	Development
		Percent of total				Percent of federally supported				Percent of non-federally supported		
1953	100.0	45.1	49.0	5.9	54.7	54.7	39.6	5.7	45.3	33.6	60.3	6.1
1954	100.0	49.0	45.3	5.6	54.7	58.7	36.2	5.2	45.3	37.4	56.4	6.2
1955	100.0	52.5	41.4	6.1	55.8	61.0	33.0	6.0	44.2	41.7	52.0	6.3
1956	100.0	56.3	37.3	6.4	56.5	64.5	29.4	6.1	43.5	45.6	47.6	6.8
1957	100.0	60.2	33.8	6.0	55.8	68.9	26.1	5.0	44.2	49.1	43.6	7.3
1958	100.0	63.5	30.9	5.6	57.0	72.1	23.4	4.5	43.0	52.1	40.8	7.1
1959	100.0	66.2	28.5	5.3	60.7	73.8	21.8	4.4	39.3	54.4	38.8	6.7
1960	100.0	68.8	26.3	4.9	64.2	75.2	20.6	4.2	35.8	57.1	36.7	6.2
1961	100.0	71.7	23.8	4.5	66.8	77.5	18.6	3.9	33.2	59.9	34.3	5.8
1962	100.0	74.2	21.8	4.0	69.2	79.5	17.3	3.3	30.8	62.4	31.9	5.7
1963	100.0	77.1	19.5	3.4	71.2	82.2	15.2	2.6	28.8	64.7	30.0	5.3
1964	100.0	77.9	18.6	3.5	72.4	82.8	14.3	3.0	27.6	65.1	29.9	5.0
1965	100.0	76.5	19.0	4.4	73.2	80.8	15.0	4.1	26.8	64.8	29.9	5.3
1966	100.0	75.9	19.3	4.8	73.4	79.9	15.6	4.6	26.6	65.0	29.6	5.4
1967	100.0	76.3	19.1	4.6	73.2	79.7	15.9	4.4	26.8	67.2	27.7	5.1
1968	100.0	76.8	18.5	4.6	72.5	79.8	15.7	4.5	27.5	69.1	25.9	5.0
1969	100.0	76.9	18.3	4.8	71.2	79.3	15.8	4.9	28.8	71.0	24.4	4.6
1970	100.0	76.7	18.6	4.6	69.7	78.5	16.6	5.0	30.3	72.7	23.4	3.9
1971	100.0	76.7	19.5	3.8	68.6	78.7	17.4	3.9	31.4	72.4	24.0	3.6
1972	100.0	73.9	22.4	3.7	68.6	76.0	20.7	3.3	31.4	69.3	26.3	4.4
1973	100.0	71.2	24.5	4.2	68.0	74.1	22.4	3.5	32.0	65.1	29.1	5.8
1974	100.0	71.0	24.7	4.4	67.2	74.5	22.1	3.4	32.8	63.7	30.0	6.3
1975	100.0	69.5	26.2	4.4	67.2	73.7	22.9	3.4	32.8	60.8	32.9	6.3
1976	100.0	68.6	26.7	4.7	67.2	73.5	22.7	3.8	32.8	58.7	34.9	6.5
1977	100.0	68.3	25.9	5.8	66.6	73.1	21.6	5.3	33.4	58.7	34.4	6.9
1978	100.0	67.6	25.0	7.5	66.6	72.1	20.3	7.6	33.4	58.6	34.3	7.1
1979	100.0	67.0	24.8	8.2	67.3	70.7	20.6	8.7	32.7	59.4	33.5	7.1
1980	100.0	66.8	25.1	8.0	67.1	70.6	21.0	8.3	32.9	59.2	33.5	7.4
1981	100.0	66.9	25.1	8.0	65.9	71.3	20.4	8.3	34.1	58.2	34.3	7.5
1982	100.0	67.0	25.2	7.9	64.2	71.2	20.6	8.1	35.8	59.3	33.3	7.3
1983	100.0	66.9	25.6	7.5	63.1	70.8	21.5	7.7	36.9	60.2	32.7	7.2
1984	100.0	67.1	25.5	7.4	62.8	71.1	21.3	7.6	37.2	60.4	32.5	7.1
1985	100.0	68.1	24.5	7.3	62.0	72.1	20.3	7.6	38.0	61.7	31.4	6.9
1986	100.0	68.8	24.1	7.1	60.9	72.9	19.8	7.3	39.1	62.5	30.7	6.7
1987	100.0	67.5	25.1	7.4	60.7	71.1	21.1	7.7	39.3	61.9	31.3	6.9
1988	100.0	65.7	26.6	7.7	60.4	69.1	22.8	8.1	39.6	60.5	32.4	7.1
1989	100.0	65.4	26.8	7.8	59.6	68.9	22.8	8.3	40.4	60.1	32.7	7.2
1990	100.0	65.7	26.0	8.3	58.7	69.3	21.5	9.2	41.3	60.5	32.4	7.1
1991	100.0	66.3	25.3	8.4	58.6	69.6	20.9	9.5	41.4	61.5	31.6	6.9
1992	100.0	66.6	25.2	8.2	59.4	69.9	20.9	9.1	40.6	61.7	31.4	6.9
1993	100.0	66.7	25.0	8.3	60.1	70.3	20.5	9.1	39.9	61.3	31.7	7.0
1994	100.0	66.9	24.8	8.3	60.2	70.6	20.2	9.2	39.8	61.3	31.7	7.0
1995	100.0	67.3	24.8	7.9	60.1	71.2	20.3	8.6	39.9	61.4	31.7	7.0
1996	100.0	68.0	24.5	7.5	59.8	71.9	20.1	7.9	40.2	62.1	31.0	6.8
1997	100.0	68.6	24.1	7.3	59.4	72.3	19.9	7.8	40.6	63.1	30.2	6.6
1998	100.0	68.7	24.1	7.2	59.1	72.3	20.1	7.6	40.9	63.5	29.9	6.6

NOTE: Data for 1998 are preliminary, and data for all years are reported on a calendar year basis rather than an academic year basis. See appendix tables 2-3, 2-7, 2-11, and 2-15 for the data underlying these percentages.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figure 6-2 in Volume 1.

Appendix table 6-2.
Support for academic R&D, by sector: 1953–98

Year	Total	Source of support				
		Federal Government	State/local government	Industry	Academic institutions	All other sources
		Millions of current dollars				
1953	273	149	40	21	37	27
1954	301	165	45	24	40	29
1955	342	191	50	27	42	32
1956	391	221	57	32	46	36
1957	433	242	64	37	51	40
1958	491	280	72	39	56	45
1959	586	356	81	40	61	50
1960	705	453	90	40	67	55
1961	834	557	101	40	75	62
1962	993	687	112	41	84	70
1963	1,178	839	125	41	96	78
1964	1,375	995	138	41	114	88
1965	1,595	1,167	150	42	136	101
1966	1,818	1,335	160	45	165	114
1967	2,035	1,491	168	52	200	126
1968	2,187	1,586	185	58	221	139
1969	2,280	1,624	208	61	233	155
1970	2,418	1,686	237	66	259	171
1971	2,565	1,760	262	72	290	182
1972	2,757	1,890	282	79	312	195
1973	2,953	2,009	302	90	343	211
1974	3,216	2,160	320	104	393	239
1975	3,570	2,400	348	118	432	272
1976	3,899	2,619	369	131	480	300
1977	4,346	2,893	394	155	569	337
1978	4,996	3,329	443	182	679	364
1979	5,715	3,848	482	215	785	386
1980	6,455	4,335	519	264	920	419
1981	7,085	4,670	581	314	1,058	463
1982	7,603	4,879	621	363	1,207	534
1983	8,251	5,210	658	432	1,357	595
1984	9,154	5,748	721	518	1,514	654
1985	10,308	6,388	834	630	1,743	713
1986	11,540	7,028	969	745	2,019	780
1987	12,807	7,768	1,065	831	2,262	882
1988	14,219	8,592	1,165	934	2,527	1,003
1989	15,631	9,314	1,274	1,062	2,852	1,131
1990	16,935	9,935	1,399	1,167	3,186	1,249
1991	18,201	10,662	1,482	1,243	3,457	1,358
1992	19,383	11,523	1,524	1,321	3,568	1,448
1993	20,499	12,311	1,550	1,388	3,719	1,533
1994	21,626	13,009	1,611	1,448	3,960	1,598
1995	22,647	13,604	1,741	1,539	4,139	1,624
1996	23,720	14,180	1,839	1,655	4,375	1,672
1997	25,001	14,849	1,940	1,773	4,686	1,754
1998	26,343	15,558	2,070	1,896	4,979	1,840

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-2.
Support for academic R&D, by sector: 1953–98

Year	Total	Source of support				
		Federal Government	State/local government	Industry	Academic institutions	All other sources
	Millions of constant 1992 dollars[a]					
1953	1,350	738	196	102	181	134
1954	1,475	806	218	115	194	142
1955	1,649	921	241	130	203	154
1956	1,821	1,029	263	147	214	168
1957	1,952	1,089	289	165	230	180
1958	2,162	1,233	317	172	244	196
1959	2,553	1,549	351	172	266	216
1960	3,028	1,945	387	172	288	236
1961	3,541	2,364	427	170	316	263
1962	4,163	2,880	470	170	352	292
1963	4,884	3,476	518	168	398	323
1964	5,615	4,065	562	165	464	359
1965	6,388	4,675	599	166	545	403
1966	7,082	5,201	623	175	641	442
1967	7,682	5,627	634	194	753	474
1968	7,912	5,738	668	208	798	501
1969	7,878	5,610	719	209	805	536
1970	7,931	5,530	778	215	848	561
1971	8,001	5,488	817	225	903	568
1972	8,250	5,655	844	236	932	582
1973	8,365	5,690	854	254	972	596
1974	8,358	5,615	832	270	1,020	621
1975	8,481	5,702	827	280	1,025	646
1976	8,751	5,879	828	294	1,077	672
1977	9,163	6,098	831	326	1,199	709
1978	9,816	6,541	871	357	1,334	714
1979	10,347	6,967	872	388	1,421	698
1980	10,699	7,185	859	437	1,524	695
1981	10,733	7,074	880	476	1,602	701
1982	10,834	6,952	885	517	1,719	760
1983	11,278	7,121	899	590	1,854	813
1984	12,057	7,570	950	682	1,994	861
1985	13,126	8,134	1,061	802	2,220	908
1986	14,321	8,721	1,203	925	2,505	968
1987	15,419	9,352	1,282	1,000	2,723	1,061
1988	16,516	9,980	1,353	1,084	2,935	1,165
1989	17,422	10,381	1,419	1,183	3,178	1,261
1990	18,093	10,614	1,494	1,246	3,404	1,334
1991	18,702	10,956	1,522	1,277	3,552	1,395
1992	19,383	11,523	1,524	1,321	3,568	1,448
1993	19,972	11,994	1,510	1,352	3,623	1,493
1994	20,579	12,379	1,533	1,378	3,768	1,521
1995	21,065	12,654	1,619	1,431	3,850	1,511
1996	21,656	12,946	1,679	1,511	3,994	1,526
1997	22,408	13,309	1,739	1,589	4,200	1,572
1998	23,374	13,805	1,837	1,682	4,418	1,632

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-2.
Support for academic R&D, by sector: 1953–98

Year	Total	Source of support				
		Federal Government	State/local government	Industry	Academic institutions	All other sources
		Percentages				
1953	100.0	54.7	14.5	7.5	13.4	9.9
1954	100.0	54.7	14.8	7.8	13.1	9.6
1955	100.0	55.8	14.6	7.9	12.3	9.4
1956	100.0	56.5	14.5	8.1	11.8	9.2
1957	100.0	55.8	14.8	8.4	11.8	9.2
1958	100.0	57.0	14.7	7.9	11.3	9.1
1959	100.0	60.7	13.7	6.7	10.4	8.4
1960	100.0	64.2	12.8	5.7	9.5	7.8
1961	100.0	66.8	12.1	4.8	8.9	7.4
1962	100.0	69.2	11.3	4.1	8.5	7.0
1963	100.0	71.2	10.6	3.4	8.1	6.6
1964	100.0	72.4	10.0	2.9	8.3	6.4
1965	100.0	73.2	9.4	2.6	8.5	6.3
1966	100.0	73.4	8.8	2.5	9.0	6.2
1967	100.0	73.2	8.3	2.5	9.8	6.2
1968	100.0	72.5	8.4	2.6	10.1	6.3
1969	100.0	71.2	9.1	2.7	10.2	6.8
1970	100.0	69.7	9.8	2.7	10.7	7.1
1971	100.0	68.6	10.2	2.8	11.3	7.1
1972	100.0	68.6	10.2	2.9	11.3	7.1
1973	100.0	68.0	10.2	3.0	11.6	7.1
1974	100.0	67.2	10.0	3.2	12.2	7.4
1975	100.0	67.2	9.7	3.3	12.1	7.6
1976	100.0	67.2	9.5	3.4	12.3	7.7
1977	100.0	66.6	9.1	3.6	13.1	7.7
1978	100.0	66.6	8.9	3.6	13.6	7.3
1979	100.0	67.3	8.4	3.8	13.7	6.7
1980	100.0	67.1	8.0	4.1	14.2	6.5
1981	100.0	65.9	8.2	4.4	14.9	6.5
1982	100.0	64.2	8.2	4.8	15.9	7.0
1983	100.0	63.1	8.0	5.2	16.4	7.2
1984	100.0	62.8	7.9	5.7	16.5	7.1
1985	100.0	62.0	8.1	6.1	16.9	6.9
1986	100.0	60.9	8.4	6.5	17.5	6.8
1987	100.0	60.7	8.3	6.5	17.7	6.9
1988	100.0	60.4	8.2	6.6	17.8	7.1
1989	100.0	59.6	8.1	6.8	18.2	7.2
1990	100.0	58.7	8.3	6.9	18.8	7.4
1991	100.0	58.6	8.1	6.8	19.0	7.5
1992	100.0	59.4	7.9	6.8	18.4	7.5
1993	100.0	60.1	7.6	6.8	18.1	7.5
1994	100.0	60.2	7.4	6.7	18.3	7.4
1995	100.0	60.1	7.7	6.8	18.3	7.2
1996	100.0	59.8	7.8	7.0	18.4	7.0
1997	100.0	59.4	7.8	7.1	18.7	7.0
1998	100.0	59.1	7.9	7.2	18.9	7.0

NOTES: Data for 1998 are preliminary, and data for all years are reported on a calendar year basis rather than an academic year basis. Data in subsequent appendix tables are reported on an academic year basis and therefore differ from those reported in this table.

[a]See appendix table 2-1 for gross domestic product implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figure 6-3 in Volume 1.

Appendix table 6-3.
Sources of R&D funds at private and public institutions: 1977, 1987, and 1997

Year and institution type	Total	Source of funds				
		Federal Government	State/local government	Industry	Academic institutions	Other sources
		Millions of current dollars				
1977						
Private, total	1,448.9	1,120.4	33.9	57.2	92.6	144.9
Public, total	2,618.0	1,605.8	340.0	81.6	421.7	168.9
1987						
Private, total	4,251.9	3,163.5	96.9	295.8	365.8	330.0
Public, total	7,900.9	4,179.6	926.5	494.3	1,802.6	497.8
1997						
Private, total	7,957.2	5,750.0	167.4	555.0	806.8	678.0
Public, total	16,391.2	8,752.2	1,709.5	1,158.1	3,737.1	1,034.3
		Percentages				
1977						
Private, total	100.0	77.3	2.3	3.9	6.4	10.0
Public, total	100.0	61.3	13.0	3.1	16.1	6.5
1987						
Private, total	100.0	74.4	2.3	7.0	8.6	7.8
Public, total	100.0	52.9	11.7	6.3	22.8	6.3
1997						
Private, total	100.0	72.3	2.1	7.0	10.1	8.5
Public, total	100.0	53.4	10.4	7.1	22.8	6.3

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Academic Research and Development Expenditures: Fiscal Year 1997*, Detailed Statistical Tables, NSF 99-336 (Arlington, VA: 1999); and NSF, annual series.

See page 6-9 in Volume 1.

Appendix table 6-4.
R&D expenditures at the top 100 academic institutions, by source of funds: 1997
(Millions of current dollars)

Rank and academic institution	Institution type	Total	Source of funds				
			Federal Government	State/ local government	Industry	Academic institutions	All other sources
Total, all institutions		24,348	14,502	1,877	1,713	4,544	1,712
1 University of Michigan, all campuses	Public	483	296	3	31	101	52
2 Johns Hopkins University[a]	Private	421	331	1	13	28	47
3 University of Wisconsin-Madison	Public	420	234	37	15	88	47
4 Massachusetts Institute of Technology	Private	411	311	3	59	25	13
5 University of Washington–Seattle	Public	410	321	11	38	33	7
6 Johns Hopkins University Applied Physics Lab	Private	408	393	0	0	14	0
7 Stanford University	Private	395	332	2	24	17	20
8 University of California-San Diego	Public	378	275	14	19	36	34
9 University of California-Los Angeles	Public	375	239	9	20	57	50
10 Texas A&M University, all campuses	Public	367	145	84	32	101	5
Total, top 10 institutions		4,068	2,878	163	252	501	275
11 University of Minnesota, all campuses	Public	363	200	51	24	54	34
12 University of California-Berkeley	Public	357	186	50	17	77	26
13 Cornell University, all campuses	Private	351	206	37	8	70	31
14 Pennsylvania State University, all campuses	Public	340	185	12	57	86	0
15 University of California-San Francisco	Public	334	229	13	22	36	33
16 Harvard University	Private	300	223	*	12	37	29
17 University of Pennsylvania	Private	296	217	4	19	26	30
18 Ohio State University, all campuses	Public	289	123	48	37	60	22
19 University of Illinois at Urbana-Champaign	Public	286	156	37	12	68	14
20 University of Arizona	Public	285	152	7	15	101	10
Total, top 20 institutions		7,270	4,755	421	474	1,117	503
21 University of Florida	Public	271	94	66	24	78	9
22 University of Colorado, all campuses	Public	270	192	5	9	27	36
23 Washington University	Private	262	187	4	21	27	23
24 University of Southern California	Private	259	192	6	22	40	0
25 University of California-Davis	Public	255	124	17	9	84	21
26 Duke University	Private	252	156	6	48	18	24
27 Yale University	Private	246	189	1	17	15	24
28 Columbia University in the City of New York	Private	244	212	3	2	0	28
29 Georgia Institute of Technology, all campuses	Public	240	113	12	48	68	0
30 University of Texas at Austin	Public	239	152	18	30	34	5
Total, top 30 institutions		9,809	6,366	559	704	1,508	673
31 North Carolina State University at Raleigh	Public	229	69	78	27	54	1
32 University of Georgia	Public	225	54	42	10	118	*
33 University of North Carolina at Chapel Hill	Public	221	154	31	3	33	0
34 University of Maryland at College Park	Public	216	103	52	5	39	17
35 Purdue University, all campuses	Public	207	92	22	26	67	*
36 Louisiana State University, all campuses	Public	205	65	69	13	46	12
37 University of Alabama at Birmingham	Public	204	151	1	16	22	14
38 University of Pittsburgh, all campuses	Public	203	161	1	10	16	15
39 Northwestern University	Private	201	108	3	10	57	21
40 Baylor College of Medicine	Private	193	98	4	14	25	52
Total, top 40 institutions		11,913	7,421	861	840	1,985	805

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-4.
R&D expenditures at the top 100 academic institutions, by source of funds: 1997
(Millions of current dollars)

Rank and academic institution	Institution type	Total	Source of funds				
			Federal Government	State/ local government	Industry	Academic institutions	All other sources
41 Michigan State University	Public	190	83	33	7	58	10
42 University of Iowa	Public	184	109	6	16	41	14
43 Rutgers the State Univ of NJ, all campuses	Public	183	68	23	9	71	12
44 California Institute of Technology	Private	178	164	1	4	7	2
45 Virginia Polytechnic Institute and State University	Public	170	88	33	11	34	3
46 Indiana University, all campuses	Public	165	96	2	4	43	20
47 Emory University	Private	164	109	5	7	23	20
48 Case Western Reserve University	Private	162	121	6	6	14	15
49 Iowa State University	Public	155	53	47	8	42	5
50 University of Rochester	Private	155	118	9	14	5	9
Total, top 50 institutions		13,620	8,430	1,026	926	2,322	915
51 University of Tennessee Univ-Wide Adm Cent Off	Public	154	74	28	13	29	11
52 New York University	Private	153	94	1	9	20	29
53 University of Chicago	Private	151	122	*	2	10	17
54 University of Cincinnati, all campuses	Public	142	78	2	23	31	7
55 University of Connecticut, all campuses	Public	141	50	12	9	60	10
56 University of Texas Southwestern Med Ctr Dallas	Public	141	89	7	13	1	31
57 University of Illinois at Chicago	Public	139	71	3	7	49	10
58 SUNY at Stony Brook, all campuses	Public	137	87	3	7	33	7
59 University of Miami	Private	136	102	2	12	7	13
60 SUNY at Buffalo, all campuses	Public	136	78	5	14	14	24
Total, top 60 institutions		15,048	9,274	1,089	1,034	2,575	1,074
61 Carnegie Mellon University	Private	135	92	10	18	7	9
62 University of Maryland at Baltimore	Public	135	72	18	19	13	13
63 University of Missouri, Columbia	Public	132	36	18	8	64	6
64 Oregon State University	Public	131	80	28	*	15	8
65 University of Utah	Public	131	99	*	10	16	5
66 University of Texas MD Anderson Cancer Center	Public	130	50	0	0	48	32
67 Colorado State University	Public	129	79	21	6	22	*
68 University of Kentucky, all campuses	Public	125	62	7	11	42	2
69 Wayne State University	Public	124	54	11	11	37	12
70 Vanderbilt University	Private	123	99	*	3	12	9
Total, top 70 institutions		16,343	9,996	1,201	1,120	2,850	1,171
71 Boston University	Private	120	98	1	9	0	13
72 University of Hawaii at Manoa	Public	120	72	28	6	13	*
73 Georgetown University	Private	119	84	*	8	18	8
74 University of Nebraska at Lincoln	Public	117	41	39	5	31	2
75 University of New Mexico, all campuses	Public	116	77	2	3	30	4
76 Princeton University	Private	115	70	*	4	27	12
77 University of Oklahoma, all campuses	Public	114	46	15	7	34	13
78 University of Virginia, all campuses	Public	114	82	4	8	9	10
79 University of California-Irvine	Public	113	71	3	10	15	13
80 University of Medicine and Dentistry of New Jersey	Public	110	57	7	9	28	10
Total, top 80 institutions		17,503	10,696	1,301	1,188	3,057	1,256

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-4.
R&D expenditures at the top 100 academic institutions, by source of funds: 1997
(Millions of current dollars)

Rank and academic institution	Institution type	Total	Source of funds				
			Federal Govern-ment	State/ local government	Industry	Academic institutions	All other sources
81 Rockefeller University	Private	110	44	2	3	30	32
82 University of Kansas, all campuses	Public	109	47	10	8	38	6
83 University of South Florida	Public	100	31	8	4	50	7
84 Oregon Health Sciences University	Public	98	69	3	7	13	6
85 Washington State University	Public	98	45	3	3	36	10
86 Yeshiva University	Private	97	78	0	0	16	2
87 Florida State University	Public	96	53	2	1	36	5
88 University of Texas Hlth Sci Ctr Houston	Public	96	67	*	10	6	12
89 University of California-Santa Barbara	Public	95	74	2	3	9	6
90 Mount Sinai School of Medicine	Private	95	61	3	7	12	13
Total, top 90 institutions		18,495	11,264	1,334	1,234	3,303	1,355
91 Utah State University	Public	91	50	17	3	19	2
92 Tulane University	Private	86	50	2	13	18	4
93 University of Texas Hlth Sci Ctr San Antonio	Public	86	53	7	9	11	5
94 University of Massachusetts at Amherst	Public	86	41	7	6	26	7
95 Allegheny University of the Health Sciences	Private	86	48	9	9	15	5
96 Auburn University, all campuses	Public	85	27	*	5	49	4
97 Mississippi State University	Public	84	35	25	5	10	9
98 Clemson University	Public	84	28	16	5	30	5
99 Tufts University	Private	84	55	*	5	15	7
100 New Mexico State University, all campuses	Public	81	57	11	2	8	2
Total, top 100 institutions		19,349	11,709	1,428	1,297	3,503	1,404

* = less than $1 million

[a]These figures exclude the Applied Physics Laboratory (APL) at Johns Hopkins University, which is similar to a federally-funded research and development center and dominates the R&D performed at the university. APL is included as a separate entry in the table.

See figure 6-4 in Volume 1.

Appendix table 6-5.
Total, Federal, and non-Federal R&D expenditures at academic institutions, by field and source of funds: 1997

Field	Total R&D		Millions of dollars		Percentages	
	Millions of dollars	Percent	Federal	Non-Federal[a]	Federal	Non-Federal[a]
TOTAL SCIENCE & ENGINEERING	24,348.3	100.0	14,502.1	9,846.2	59.6	40.4
Total sciences	20,529.8	84.3	12,233.1	8,296.7	59.6	40.4
Physical sciences	2,363.6	9.7	1,704.9	658.7	72.1	27.9
Astronomy	287.8	1.2	185.2	102.6	64.4	35.6
Chemistry	814.9	3.3	557.6	257.3	68.4	31.6
Physics	1,051.8	4.3	816.1	235.7	77.6	22.4
Other	209.1	0.9	146.0	63.1	69.8	30.2
Mathematics	293.4	1.2	205.9	87.5	70.2	29.8
Computer sciences	718.7	3.0	513.6	205.1	71.5	28.5
Environmental sciences	1,538.8	6.3	1,034.0	504.8	67.2	32.8
Atmospheric sciences	235.7	1.0	186.2	49.6	79.0	21.0
Earth sciences	455.4	1.9	271.3	184.0	59.6	40.4
Oceanography	551.2	2.3	376.4	174.8	68.3	31.7
Other	296.6	1.2	200.1	96.4	67.5	32.5
Life sciences	13,607.9	55.9	7,881.1	5,726.8	57.9	42.1
Agricultural sciences	1,979.5	8.1	568.4	1,411.1	28.7	71.3
Biological sciences	4,227.3	17.4	2,718.1	1,509.2	64.3	35.7
Medical sciences	6,866.9	28.2	4,292.1	2,574.8	62.5	37.5
Other	534.2	2.2	302.5	231.7	56.6	43.4
Psychology	386.9	1.6	269.1	117.8	69.6	30.4
Social sciences	1,116.6	4.6	418.0	698.7	37.4	62.6
Economics	250.3	1.0	88.8	161.5	35.5	64.5
Political science	175.9	0.7	52.7	123.2	29.9	70.1
Sociology	252.6	1.0	120.0	132.5	47.5	52.5
Other	437.9	1.8	156.5	281.4	35.7	64.3
Other sciences	503.8	2.1	206.4	297.4	41.0	59.0
Total engineering	3,818.5	15.7	2,269.0	1,549.4	59.4	40.6
Aeronautical/astronautical	244.3	1.0	180.3	64.0	73.8	26.2
Bioengineering/biomedical	65.8	0.3	41.2	24.6	62.6	37.4
Chemical	317.4	1.3	167.5	149.9	52.8	47.2
Civil	452.8	1.9	196.7	256.1	43.4	56.6
Electrical/electronic	948.9	3.9	634.6	314.3	66.9	33.1
Mechanical	519.8	2.1	327.2	192.6	62.9	37.1
Materials	391.7	1.6	223.1	168.6	57.0	43.0
Other	877.8	3.6	498.3	379.4	56.8	43.2

[a]See appendix table 6-2 for detail on non-Federal sources.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Academic Research and Development Expenditures: Fiscal Year 1997*, Detailed Statistical Tables, NSF 99-336 (Arlington, VA: 1999); and NSF, special tabulations.

See page 6-10 in Volume 1.

Appendix table 6-6.
Percentage of academic R&D funds federally financed, by field: 1973–97

Field	1973	1976	1979	1982	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
TOTAL SCIENCE & ENGINEERING	68.8	67.4	67.1	65.1	62.6	61.4	60.4	60.9	60.0	59.2	58.2	58.9	59.9	60.2	60.1	60.0	59.6
Total sciences	68.5	67.4	66.8	64.8	62.8	61.7	60.7	61.3	60.4	59.5	58.6	59.3	60.1	60.3	60.2	60.0	59.6
Physical sciences	81.8	80.5	81.5	78.9	77.5	76.4	75.2	74.5	72.7	72.8	71.4	71.8	71.0	72.0	72.8	72.4	72.1
Astronomy	73.4	69.8	74.8	70.6	67.0	68.5	65.7	66.1	64.0	66.1	64.4	66.5	63.8	67.6	68.1	65.9	64.4
Chemistry	76.1	77.0	75.8	74.7	74.2	72.1	71.7	71.3	69.6	68.7	67.3	68.1	68.2	68.5	69.5	69.7	68.4
Physics	87.1	85.3	86.5	83.5	82.2	80.9	79.4	78.4	77.1	77.5	77.1	76.9	75.3	76.3	77.4	76.9	77.6
Other	79.7	77.2	82.7	81.2	75.1	75.8	75.1	74.7	69.5	71.8	66.4	67.7	70.3	70.8	70.8	69.8	69.8
Mathematics	77.5	77.4	77.6	74.5	75.9	75.5	74.4	75.4	73.3	72.6	74.1	74.0	74.6	72.9	73.1	72.4	70.2
Computer sciences	69.9	74.0	70.9	74.2	69.7	72.4	69.1	70.8	68.5	66.5	67.0	68.4	69.7	71.4	70.5	72.5	71.5
Environmental sciences	75.2	73.4	72.6	70.1	67.2	66.6	65.0	65.9	64.8	63.8	62.7	63.7	66.0	67.4	66.9	67.3	67.2
Atmospheric sciences	NA	NA	NA	79.9	79.8	81.2	82.0	81.2	77.9	75.7	74.1	72.1	76.3	79.5	78.9	78.7	79.0
Earth sciences	NA	NA	NA	64.9	60.7	58.3	56.2	59.3	57.7	57.7	56.7	57.7	58.4	58.9	59.0	59.2	59.6
Oceanography	NA	NA	NA	77.4	72.7	74.3	72.6	71.6	72.5	69.4	67.6	71.6	71.9	71.1	70.1	69.8	68.3
Other	75.2	73.4	72.6	53.5	53.9	50.3	48.9	49.8	48.1	51.0	52.9	51.6	58.6	66.7	65.4	66.5	67.5
Life sciences	66.3	65.7	64.1	62.4	60.4	59.3	58.8	59.6	59.3	58.3	57.2	58.0	58.9	58.7	58.3	58.1	57.9
Agricultural sciences	34.1	29.7	30.2	29.5	29.4	26.8	26.6	27.4	27.3	26.1	25.9	27.6	28.9	29.9	29.5	29.2	28.7
Biological sciences	71.6	73.5	72.6	71.4	67.9	67.4	66.2	66.8	65.8	64.5	63.7	64.7	65.3	65.5	64.7	64.4	64.3
Medical sciences	75.3	75.5	73.7	72.0	68.0	66.6	65.4	65.5	65.5	64.3	62.7	62.7	63.3	62.7	63.0	62.9	62.5
Other	70.3	72.6	70.1	64.0	60.0	61.3	59.8	61.7	61.0	59.1	60.0	58.2	59.3	58.9	56.7	58.1	56.6
Psychology	79.5	76.2	72.3	68.1	66.9	67.0	66.1	65.9	65.5	64.8	65.8	65.4	67.0	67.6	67.8	68.3	69.6
Social sciences	57.3	52.7	53.0	45.6	40.1	37.4	33.6	34.2	33.5	32.2	33.7	34.5	37.7	37.7	38.2	38.8	37.4
Economics	47.6	44.5	48.4	43.7	37.0	33.5	29.1	30.2	29.1	27.1	28.6	29.8	33.4	31.3	31.9	33.5	35.5
Political science	40.6	42.2	46.0	37.3	33.1	29.4	29.7	29.0	25.0	22.0	22.8	24.7	28.3	30.9	34.2	34.4	29.9
Sociology	65.8	62.1	63.4	58.5	53.5	51.2	46.2	44.1	45.2	45.5	46.3	50.0	49.7	49.4	48.7	52.0	47.5
Other	61.0	54.8	52.2	42.8	38.5	35.8	32.4	34.4	34.9	33.9	35.5	34.2	38.5	38.7	38.2	36.8	35.7
Other sciences	58.7	59.5	54.9	56.5	49.3	47.1	44.8	41.9	40.1	41.1	33.8	32.4	35.1	36.4	44.0	41.4	41.0
Total engineering	71.5	67.3	68.7	67.2	61.2	59.6	58.8	58.7	57.8	57.4	56.4	57.2	58.9	59.6	59.9	60.3	59.4
Aeronautical/astronautical	NA	NA	NA	79.1	76.4	77.0	74.1	76.3	77.5	77.7	76.4	76.7	75.2	75.7	75.9	73.0	73.8
Bioengineering/biomedical	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	62.6
Chemical	NA	NA	NA	62.0	55.6	55.4	51.7	52.6	52.1	50.6	48.4	48.4	52.2	54.1	54.3	55.0	52.8
Civil	NA	NA	NA	51.5	51.5	49.6	47.0	45.6	41.7	41.2	39.3	42.3	41.6	41.0	43.2	43.4	43.4
Electrical/electronic	NA	NA	NA	77.1	67.7	65.9	64.8	64.9	65.0	65.1	64.2	63.9	65.7	66.0	66.7	67.7	66.9
Mechanical	NA	NA	NA	68.3	64.6	64.9	64.9	63.5	62.4	61.0	59.7	59.7	64.2	65.5	65.4	64.9	62.9
Materials	NA	NA	NA	NA	NA	NA	NA	NA	NA	50.9	50.4	48.7	50.3	50.2	53.2	53.9	57.0
Other	71.5	67.3	68.7	65.3	57.3	54.6	55.0	54.9	53.6	54.6	54.8	57.5	58.9	60.3	58.6	59.8	56.8

NA = not available

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Academic Research and Development Expenditures: Fiscal Year 1997*, Detailed Statistical Tables, NSF 99-336 (Arlington, VA: 1999); and NSF, special tabulations.

See page 6-11 in Volume 1.

Appendix table 6-7.
Expenditures for academic R&D, by field: 1973–97

Field	1973	1976	1979	1982	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
								Millions of current dollars									
TOTAL SCIENCE & ENGINEERING	2,884	3,729	5,366	7,324	9,687	10,928	12,153	13,463	14,976	16,285	17,584	18,816	19,948	21,051	22,203	23,092	24,348
Total sciences	2,551	3,297	4,591	6,296	8,269	9,287	10,261	11,367	12,584	13,629	14,677	15,753	16,792	17,710	18,702	19,399	20,530
Physical sciences	328	379	602	824	1,148	1,287	1,398	1,554	1,647	1,807	1,939	2,055	2,130	2,172	2,250	2,256	2,364
Astronomy	24	26	48	73	96	102	108	127	137	170	211	238	259	269	306	277	288
Chemistry	114	140	206	308	422	470	514	565	606	648	671	705	740	759	771	801	815
Physics	167	183	292	367	551	631	673	740	786	842	881	921	940	951	981	984	1,052
Other	23	30	55	75	80	85	103	122	117	147	176	191	191	193	191	194	209
Mathematics	37	42	78	96	128	152	177	199	215	222	230	248	272	282	281	291	293
Computer sciences	36	45	98	164	281	321	372	408	473	515	554	555	608	648	687	697	719
Environmental sciences	209	289	453	558	705	776	839	894	1,003	1,068	1,117	1,240	1,317	1,407	1,444	1,504	1,539
Atmospheric sciences	NA	NA	NA	87	108	121	132	138	165	173	175	194	210	207	211	227	236
Earth sciences	NA	NA	NA	195	254	274	284	294	324	354	384	413	416	465	464	454	455
Oceanography	NA	NA	NA	198	258	280	299	333	359	377	390	428	459	455	477	537	551
Other	209	289	453	78	86	101	123	128	156	163	169	205	232	281	293	285	297
Life sciences	1,530	2,102	2,834	4,014	5,279	5,891	6,529	7,257	8,061	8,726	9,472	10,196	10,851	11,497	12,220	12,756	13,608
Agricultural sciences	277	413	599	864	999	1,089	1,121	1,176	1,282	1,349	1,458	1,512	1,559	1,666	1,819	1,916	1,979
Biological sciences	557	711	912	1,287	1,781	1,946	2,144	2,408	2,640	2,859	3,064	3,303	3,536	3,735	3,861	3,941	4,227
Medical sciences	646	897	1,247	1,739	2,318	2,615	3,000	3,377	3,819	4,154	4,546	4,964	5,324	5,639	6,071	6,396	6,867
Other	51	81	76	123	181	240	264	296	321	363	404	417	433	457	468	502	534
Psychology	74	78	100	130	158	170	187	213	234	253	283	328	350	357	368	374	387
Social sciences	231	262	293	354	383	462	502	552	633	703	750	815	896	954	1,021	1,102	1,117
Economics	48	65	83	95	118	136	149	163	187	201	209	222	231	243	250	272	250
Political science	26	28	45	60	59	69	81	87	103	115	125	142	151	163	175	182	176
Sociology	62	66	73	80	75	96	95	108	119	132	156	163	183	196	215	235	253
Other	96	102	92	119	131	162	177	194	224	255	260	288	331	352	381	413	438
Other sciences	106	101	133	156	186	228	256	290	318	336	332	315	368	392	430	420	504
Total engineering	333	432	776	1,028	1,418	1,641	1,892	2,096	2,392	2,657	2,907	3,063	3,156	3,341	3,500	3,693	3,818
Aeronautical/astronautical	NA	NA	NA	62	81	94	108	123	148	164	180	197	213	214	238	231	244
Bioengineering/biomedical	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	66
Chemical	NA	NA	NA	89	116	132	148	163	194	218	244	261	274	278	297	315	317
Civil	NA	NA	NA	116	153	178	191	224	245	284	315	339	371	399	425	449	453
Electrical/electronic	NA	NA	NA	218	337	395	451	509	595	663	679	704	698	743	817	886	949
Mechanical	NA	NA	NA	143	208	228	275	304	343	391	421	451	483	498	519	518	520
Materials	NA	NA	NA	NA	NA	NA	NA	NA	NA	274	304	294	299	309	329	350	392
Other	333	432	776	399	523	613	719	774	867	663	764	817	818	899	876	944	878

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-7.
Expenditures for academic R&D, by field: 1973–97

Field	1973	1976	1979	1982	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
	Millions of constant 1992 dollars[a]																
TOTAL SCIENCE & ENGINEERING	8,379	8,543	9,857	10,504	12,361	13,558	14,654	15,689	16,744	17,483	18,100	18,816	19,435	20,025	20,625	21,039	21,773
Total sciences	7,411	7,554	8,432	9,030	10,552	11,522	12,373	13,247	14,070	14,631	15,108	15,753	16,361	16,847	17,373	17,674	18,358
Physical sciences	954	869	1,106	1,182	1,465	1,596	1,686	1,811	1,842	1,940	1,996	2,055	2,076	2,066	2,090	2,055	2,114
Astronomy	70	60	89	105	123	126	131	148	154	183	217	238	252	256	285	253	257
Chemistry	330	321	379	442	538	583	619	659	678	695	690	705	721	722	717	730	729
Physics	485	419	537	527	703	782	812	862	879	904	907	921	916	904	911	896	941
Other	68	68	101	108	102	105	124	143	131	158	181	191	186	184	177	177	187
Mathematics	108	97	143	138	163	188	214	232	240	238	237	248	265	269	261	265	262
Computer sciences	104	102	179	235	358	399	449	476	528	553	571	555	592	617	638	635	643
Environmental sciences	608	661	832	800	900	963	1,012	1,042	1,122	1,146	1,150	1,240	1,283	1,339	1,342	1,370	1,376
Atmospheric sciences	NA	NA	NA	125	138	150	160	161	185	186	180	194	205	197	196	206	211
Earth sciences	NA	NA	NA	280	324	340	342	343	362	381	396	413	406	442	431	414	407
Oceanography	NA	NA	NA	284	329	347	361	388	401	405	401	428	447	433	443	490	493
Other	608	661	832	112	110	126	149	150	174	175	174	205	226	267	272	260	265
Life sciences	4,445	4,815	5,205	5,757	6,736	7,309	7,872	8,457	9,013	9,367	9,750	10,196	10,572	10,937	11,352	11,622	12,168
Agricultural sciences	804	946	1,099	1,240	1,275	1,352	1,351	1,371	1,433	1,449	1,501	1,512	1,519	1,585	1,690	1,746	1,770
Biological sciences	1,617	1,628	1,676	1,846	2,273	2,415	2,585	2,806	2,951	3,069	3,153	3,303	3,445	3,553	3,587	3,591	3,780
Medical sciences	1,876	2,056	2,290	2,494	2,958	3,245	3,617	3,936	4,269	4,460	4,680	4,964	5,187	5,364	5,640	5,828	6,140
Other	147	185	140	177	231	297	318	345	358	390	415	417	422	435	435	458	478
Psychology	214	178	183	187	202	211	226	248	261	271	291	328	341	340	342	341	346
Social sciences	671	601	539	507	489	574	606	643	708	755	772	815	873	907	948	1,004	998
Economics	138	150	153	137	151	168	180	190	209	215	215	222	225	231	232	248	224
Political science	74	65	82	86	76	85	98	101	116	124	129	142	147	155	163	166	157
Sociology	179	152	134	114	95	119	115	126	133	142	160	163	179	186	200	214	226
Other	280	234	169	170	167	201	213	226	250	274	268	288	322	335	354	377	392
Other sciences	307	230	245	223	238	283	309	337	356	361	341	315	359	373	400	382	451
Total engineering	968	989	1,425	1,474	1,809	2,036	2,281	2,443	2,675	2,852	2,992	3,063	3,075	3,178	3,252	3,364	3,415
Aeronautical/astronautical	NA	NA	NA	89	103	117	130	143	166	176	185	197	207	204	221	210	218
Bioengineering/biomedical	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	59
Chemical	NA	NA	NA	128	148	164	179	189	217	234	251	261	267	265	275	287	284
Civil	NA	NA	NA	166	195	221	230	261	274	305	324	339	362	380	395	409	405
Electrical/electronic	NA	NA	NA	313	431	490	544	593	665	712	699	704	680	706	759	807	848
Mechanical	NA	NA	NA	205	265	283	331	354	383	419	433	451	470	474	482	472	465
Materials	NA	NA	NA	NA	NA	NA	NA	NA	NA	294	313	294	291	294	305	319	350
Other	968	989	1,425	573	667	761	867	902	970	712	787	817	797	856	814	860	785

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-7.
Expenditures for academic R&D, by field: 1973–97

Field	1973	1976	1979	1982	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
	Percentages																
TOTAL SCIENCE & ENGINEERING	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total sciences	88.4	88.4	85.5	86.0	85.4	85.0	84.4	84.4	84.0	83.7	83.5	83.7	84.2	84.1	84.2	84.0	84.3
Physical sciences	11.4	10.2	11.2	11.3	11.9	11.8	11.5	11.5	11.0	11.1	11.0	10.9	10.7	10.3	10.1	9.8	9.7
Astronomy	0.8	0.7	0.9	1.0	1.0	0.9	0.9	0.9	0.9	1.0	1.2	1.3	1.3	1.3	1.4	1.2	1.2
Chemistry	3.9	3.8	3.8	4.2	4.4	4.3	4.2	4.2	4.0	4.0	3.8	3.7	3.7	3.6	3.5	3.5	3.3
Physics	5.8	4.9	5.4	5.0	5.7	5.8	5.5	5.5	5.2	5.2	5.0	4.9	4.7	4.5	4.4	4.3	4.3
Other	0.8	0.8	1.0	1.0	0.8	0.8	0.8	0.9	0.8	0.9	1.0	1.0	1.0	0.9	0.9	0.8	0.9
Mathematics	1.3	1.1	1.5	1.3	1.3	1.4	1.5	1.5	1.4	1.4	1.3	1.3	1.4	1.3	1.3	1.3	1.2
Computer sciences	1.2	1.2	1.8	2.2	2.9	2.9	3.1	3.0	3.2	3.2	3.2	3.0	3.0	3.1	3.1	3.0	3.0
Environmental sciences	7.3	7.7	8.4	7.6	7.3	7.1	6.9	6.6	6.7	6.6	6.4	6.6	6.6	6.7	6.5	6.5	6.3
Atmospheric sciences	NA	NA	NA	1.2	1.1	1.1	1.1	1.0	1.1	1.1	1.0	1.0	1.1	1.0	0.9	1.0	1.0
Earth sciences	NA	NA	NA	2.7	2.6	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.0	1.9
Oceanography	NA	NA	NA	2.7	2.7	2.6	2.5	2.5	2.4	2.3	2.2	2.3	2.3	2.2	2.1	2.3	2.3
Other	7.3	7.7	8.4	1.1	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.3	1.3	1.2	1.2
Life sciences	53.0	56.4	52.8	54.8	54.5	53.9	53.7	53.9	53.8	53.6	53.9	54.2	54.4	54.6	55.0	55.2	55.9
Agricultural sciences	9.6	11.1	11.2	11.8	10.3	10.0	9.2	8.7	8.6	8.3	8.3	8.0	7.8	7.9	8.2	8.3	8.1
Biological sciences	19.3	19.1	17.0	17.6	18.4	17.8	17.6	17.9	17.6	17.6	17.4	17.6	17.7	17.7	17.4	17.1	17.4
Medical sciences	22.4	24.1	23.2	23.7	23.9	23.9	24.7	25.1	25.5	25.5	25.9	26.4	26.7	26.8	27.3	27.7	28.2
Other	1.8	2.2	1.4	1.7	1.9	2.2	2.2	2.2	2.1	2.2	2.3	2.2	2.2	2.2	2.1	2.2	2.2
Psychology	2.6	2.1	1.9	1.8	1.6	1.6	1.5	1.6	1.6	1.6	1.6	1.7	1.8	1.7	1.7	1.6	1.6
Social sciences	8.0	7.0	5.5	4.8	4.0	4.2	4.1	4.1	4.2	4.3	4.3	4.3	4.5	4.5	4.6	4.8	4.6
Economics	1.7	1.8	1.6	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.2	1.0
Political science	0.9	0.8	0.8	0.8	0.6	0.6	0.7	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.7
Sociology	2.1	1.8	1.4	1.1	0.8	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.0	1.0	1.0
Other	3.3	2.7	1.7	1.6	1.4	1.5	1.5	1.4	1.5	1.6	1.5	1.5	1.7	1.7	1.7	1.8	1.8
Other sciences	3.7	2.7	2.5	2.1	1.9	2.1	2.1	2.2	2.1	2.1	1.9	1.7	1.8	1.9	1.9	1.8	2.1
Total engineering	11.6	11.6	14.5	14.0	14.6	15.0	15.6	15.6	16.0	16.3	16.5	16.3	15.8	15.9	15.8	16.0	15.7
Aeronautical/astronautical	NA	NA	NA	0.9	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.0	1.1	1.0	1.0
Bioengineering/biomedical	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.3
Chemical	NA	NA	NA	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.4	1.4	1.4	1.3	1.3	1.4	1.3
Civil	NA	NA	NA	1.6	1.6	1.6	1.6	1.7	1.6	1.7	1.8	1.8	1.9	1.9	1.9	1.9	1.9
Electrical/electronic	NA	NA	NA	3.0	3.5	3.6	3.7	3.8	4.0	4.1	3.9	3.7	3.5	3.5	3.7	3.8	3.9
Mechanical	NA	NA	NA	1.9	2.1	2.1	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.2	2.1
Materials	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.7	1.7	1.6	1.5	1.5	1.5	1.5	1.6
Other	11.6	11.6	14.5	5.5	5.4	5.6	5.9	5.8	5.8	4.1	4.3	4.3	4.1	4.3	3.9	4.1	3.6

NA = not available

[a]See appendix table 2-1 for gross domestic product implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Academic Research and Development Expenditures: Fiscal Year 1997*, Detailed Statistical Tables, NSF 99-336 (Arlington, VA: 1999); and NSF, special tabulations.

See figures 6-5 and 6-6 in Volume 1.

Appendix table 6-8.
Federal obligations for academic R&D, by agency: 1970–99

Year	All agencies	National Institutes of Health[a]	National Science Foundation	Department of Defense	National Aeronautics & Space Administration	Department of Energy[b]	Department of Agriculture	All other agencies
				Millions of current dollars				
1970	1,476	518	228	216	131	100	65	217
1971	1,645	603	267	211	134	94	72	264
1972	1,904	756	362	217	119	85	87	277
1973	1,917	826	374	204	111	83	94	224
1974	2,214	1,108	389	197	99	94	95	232
1975	2,411	1,154	435	203	108	132	108	272
1976	2,552	1,263	437	240	119	145	120	228
1977	2,905	1,399	511	273	118	188	140	276
1978	3,375	1,588	537	383	127	240	186	313
1979	3,889	1,880	617	438	139	260	200	355
1980	4,263	2,012	685	495	158	285	216	412
1981	4,466	2,101	702	573	171	300	243	376
1982	4,605	2,140	715	664	186	277	255	369
1983	4,966	2,392	783	724	189	297	275	306
1984	5,547	2,715	880	830	204	321	261	335
1985	6,340	3,158	1,002	940	237	357	293	352
1986	6,559	3,243	992	1,098	254	345	274	355
1987	7,337	3,903	1,096	1,017	294	386	280	361
1988	7,828	4,199	1,143	1,071	338	406	305	366
1989	8,672	4,565	1,254	1,189	434	454	328	449
1990	9,138	4,779	1,321	1,213	471	500	348	505
1991	10,169	5,521	1,436	1,152	534	621	386	520
1992	10,271	5,064	1,540	1,403	586	640	438	600
1993	11,208	5,848	1,562	1,616	614	583	433	553
1994	11,797	6,191	1,680	1,703	641	565	439	577
1995	11,928	6,271	1,734	1,589	708	594	435	597
1996	11,980	6,620	1,740	1,447	665	601	376	531
1997	12,561	7,057	1,819	1,345	719	583	441	597
1998 (est.)	13,273	7,509	1,908	1,394	719	584	454	705
1999 (est.)	14,171	8,188	2,150	1,373	719	598	403	739
				Millions of constant 1992 dollars[c]				
1970	4,930	1,730	762	723	438	335	216	726
1971	5,226	1,917	847	670	426	298	228	839
1972	5,774	2,293	1,099	657	361	256	265	841
1973	5,568	2,399	1,088	592	324	240	274	652
1974	5,998	3,001	1,055	535	268	255	257	628
1975	5,923	2,834	1,068	500	265	324	266	667
1976	5,846	2,893	1,000	551	272	332	274	523
1977	6,186	2,979	1,088	582	250	401	298	588
1978	6,712	3,157	1,068	762	253	477	371	623
1979	7,143	3,454	1,133	805	255	478	367	652
1980	7,192	3,394	1,155	836	266	481	365	695
1981	6,858	3,226	1,078	880	263	461	373	577
1982	6,606	3,069	1,025	952	266	397	366	530
1983	6,809	3,279	1,074	993	260	407	377	420
1984	7,322	3,584	1,162	1,096	269	423	345	443
1985	8,089	4,029	1,278	1,199	303	456	374	450
1986	8,137	4,023	1,230	1,362	315	428	339	440
1987	8,848	4,707	1,322	1,226	354	466	337	435
1988	9,122	4,893	1,333	1,248	394	473	355	426
1989	9,696	5,104	1,402	1,329	485	507	367	502
1990	9,809	5,130	1,418	1,303	505	537	374	542
1991	10,467	5,683	1,478	1,186	549	639	397	535
1992	10,271	5,064	1,540	1,403	586	640	438	600
1993	10,920	5,697	1,522	1,574	598	568	422	539
1994	11,222	5,890	1,598	1,620	610	537	417	549
1995	11,080	5,825	1,610	1,476	658	552	404	554
1996	10,915	6,032	1,585	1,318	605	548	343	484
1997	11,232	6,311	1,627	1,202	643	522	394	534
1998 (est.)	11,729	6,635	1,686	1,232	635	516	401	623
1999 (est.)	12,361	7,142	1,875	1,198	627	521	352	645

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-8.
Federal obligations for academic R&D, by agency: 1970–99

Year	All agencies	National Institutes of Health[a]	National Science Foundation	Department of Defense	National Aeronautics & Space Administration	Department of Energy[b]	Department of Agriculture	All other agencies
				Percentages by agency				
1970	100.0	35.1	15.4	14.7	8.9	6.8	4.4	14.7
1971	100.0	36.7	16.2	12.8	8.2	5.7	4.4	16.0
1972	100.0	39.7	19.0	11.4	6.3	4.4	4.6	14.6
1973	100.0	43.1	19.5	10.6	5.8	4.3	4.9	11.7
1974	100.0	50.0	17.6	8.9	4.5	4.2	4.3	10.5
1975	100.0	47.8	18.0	8.4	4.5	5.5	4.5	11.3
1976	100.0	49.5	17.1	9.4	4.7	5.7	4.7	9.0
1977	100.0	48.2	17.6	9.4	4.0	6.5	4.8	9.5
1978	100.0	47.0	15.9	11.4	3.8	7.1	5.5	9.3
1979	100.0	48.4	15.9	11.3	3.6	6.7	5.1	9.1
1980	100.0	47.2	16.1	11.6	3.7	6.7	5.1	9.7
1981	100.0	47.0	15.7	12.8	3.8	6.7	5.4	8.4
1982	100.0	46.5	15.5	14.4	4.0	6.0	5.5	8.0
1983	100.0	48.2	15.8	14.6	3.8	6.0	5.5	6.2
1984	100.0	49.0	15.9	15.0	3.7	5.8	4.7	6.0
1985	100.0	49.8	15.8	14.8	3.7	5.6	4.6	5.6
1986	100.0	49.4	15.1	16.7	3.9	5.3	4.2	5.4
1987	100.0	53.2	14.9	13.9	4.0	5.3	3.8	4.9
1988	100.0	53.6	14.6	13.7	4.3	5.2	3.9	4.7
1989	100.0	52.6	14.5	13.7	5.0	5.2	3.8	5.2
1990	100.0	52.3	14.5	13.3	5.2	5.5	3.8	5.5
1991	100.0	54.3	14.1	11.3	5.2	6.1	3.8	5.1
1992	100.0	49.3	15.0	13.7	5.7	6.2	4.3	5.8
1993	100.0	52.2	13.9	14.4	5.5	5.2	3.9	4.9
1994	100.0	52.5	14.2	14.4	5.4	4.8	3.7	4.9
1995	100.0	52.6	14.5	13.3	5.9	5.0	3.6	5.0
1996	100.0	55.3	14.5	12.1	5.5	5.0	3.1	4.4
1997	100.0	56.2	14.5	10.7	5.7	4.6	3.5	4.8
1998 (est.)	100.0	56.6	14.4	10.5	5.4	4.4	3.4	5.3
1999 (est.)	100.0	57.8	15.2	9.7	5.1	4.2	2.8	5.2

NOTE: Percentages may not total 100 because of rounding.

[a]Data for the National Institutes of Health include the Alcohol, Drug Abuse, and Mental Health Administration.

[b]Data for 1970 to 1973 are for the Atomic Energy Commission; data for 1974 to 1976 are for the Energy Research and Development Administration; data for 1977 and thereafter are for the U.S. Department of Energy.

[c]See appendix table 2-1 for gross domestic product implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999,* Detailed Statistical Tables, Vol. 47, NSF 99-333 (Arlington, VA: 1999); and NSF, annual series.

See page 6-12 in Volume 1.

Appendix table 6-9.
Federal obligations for academic research, by agency: 1970–99

Year	All agencies	National Institutes of Health[a]	National Science Foundation	Department of Defense	National Aeronautics & Space Administration	Department of Energy[b]	Department of Agriculture	All other agencies
				Millions of current dollars				
1970	1,276	480	223	173	65	97	65	174
1971	1,430	551	254	184	70	90	72	210
1972	1,643	677	346	177	48	81	87	226
1973	1,691	749	370	161	80	79	94	158
1974	1,958	1,004	369	167	85	86	94	153
1975	2,079	1,036	420	165	91	112	108	148
1976	2,250	1,138	429	192	98	116	119	158
1977	2,584	1,269	505	221	105	134	139	211
1978	2,928	1,437	534	243	116	175	181	241
1979	3,333	1,657	612	271	125	204	198	266
1980	3,699	1,835	680	313	146	224	214	287
1981	3,920	1,929	698	363	157	248	240	284
1982	4,045	1,995	713	413	156	236	253	280
1983	4,468	2,246	783	472	170	273	273	250
1984	5,030	2,573	880	539	177	311	260	290
1985	5,726	2,990	1,002	587	213	336	292	305
1986	5,883	3,054	992	707	225	334	273	298
1987	6,640	3,651	1,096	681	263	372	279	298
1988	7,023	3,856	1,143	729	310	384	304	297
1989	7,793	4,167	1,254	840	387	437	326	382
1990	8,137	4,349	1,321	795	422	479	346	426
1991	8,868	4,729	1,436	794	474	596	384	456
1992	9,061	4,517	1,540	912	512	605	436	538
1993	9,892	5,253	1,562	1,090	539	547	429	472
1994	10,292	5,517	1,680	1,079	555	529	436	496
1995	10,354	5,481	1,734	1,047	588	558	431	516
1996	10,707	5,924	1,740	1,071	560	566	373	471
1997	11,173	6,309	1,819	945	596	552	437	515
1998 (est.)	11,815	6,775	1,908	933	596	550	449	604
1999 (est.)	12,721	7,304	2,150	1,083	596	553	400	636
				Millions of constant 1992 dollars[c]				
1970	4,265	1,605	746	576	219	323	216	580
1971	4,545	1,750	806	585	223	285	228	668
1972	4,983	2,054	1,050	536	146	246	265	686
1973	4,913	2,176	1,076	466	234	229	274	459
1974	5,306	2,721	1,000	452	230	232	256	415
1975	5,106	2,544	1,031	405	223	275	264	363
1976	5,154	2,607	982	439	224	266	273	363
1977	5,500	2,701	1,074	470	224	285	296	450
1978	5,823	2,858	1,062	483	231	348	361	480
1979	6,123	3,044	1,125	498	230	374	364	488
1980	6,240	3,095	1,147	527	246	378	362	484
1981	6,020	2,963	1,072	557	241	381	369	437
1982	5,802	2,861	1,023	592	224	338	363	402
1983	6,126	3,080	1,074	647	233	375	374	343
1984	6,639	3,396	1,162	711	233	411	343	383
1985	7,307	3,816	1,278	749	272	429	373	390
1986	7,300	3,789	1,230	878	279	415	339	370
1987	8,007	4,402	1,322	821	317	448	337	360
1988	8,184	4,494	1,333	849	361	448	355	346
1989	8,713	4,659	1,402	939	433	489	365	428
1990	8,735	4,668	1,418	854	453	514	371	457
1991	9,128	4,868	1,478	817	488	613	395	469
1992	9,061	4,517	1,540	912	512	605	436	538
1993	9,638	5,118	1,522	1,062	525	533	418	460
1994	9,790	5,249	1,598	1,026	528	503	414	472
1995	9,618	5,091	1,610	973	546	518	401	479
1996	9,755	5,398	1,585	976	510	516	340	430
1997	9,991	5,641	1,627	845	533	494	390	461
1998 (est.)	10,440	5,987	1,686	825	527	486	397	533
1999 (est.)	11,097	6,372	1,875	944	520	482	349	555

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-9.
Federal obligations for academic research, by agency: 1970–99

Year	All agencies	National Institutes of Health[a]	National Science Foundation	Department of Defense	National Aeronautics & Space Administration	Department of Energy[b]	Department of Agriculture	All other agencies
				Percentages by agency				
1970	100.0	37.6	17.5	13.5	5.1	7.6	5.1	13.6
1971	100.0	38.5	17.7	12.9	4.9	6.3	5.0	14.7
1972	100.0	41.2	21.1	10.8	2.9	4.9	5.3	13.8
1973	100.0	44.3	21.9	9.5	4.8	4.7	5.6	9.3
1974	100.0	51.3	18.8	8.5	4.3	4.4	4.8	7.8
1975	100.0	49.8	20.2	7.9	4.4	5.4	5.2	7.1
1976	100.0	50.6	19.1	8.5	4.3	5.2	5.3	7.0
1977	100.0	49.1	19.5	8.6	4.1	5.2	5.4	8.2
1978	100.0	49.1	18.2	8.3	4.0	6.0	6.2	8.2
1979	100.0	49.7	18.4	8.1	3.8	6.1	5.9	8.0
1980	100.0	49.6	18.4	8.5	3.9	6.1	5.8	7.8
1981	100.0	49.2	17.8	9.3	4.0	6.3	6.1	7.3
1982	100.0	49.3	17.6	10.2	3.9	5.8	6.3	6.9
1983	100.0	50.3	17.5	10.6	3.8	6.1	6.1	5.6
1984	100.0	51.2	17.5	10.7	3.5	6.2	5.2	5.8
1985	100.0	52.2	17.5	10.3	3.7	5.9	5.1	5.3
1986	100.0	51.9	16.9	12.0	3.8	5.7	4.6	5.1
1987	100.0	55.0	16.5	10.3	4.0	5.6	4.2	4.5
1988	100.0	54.9	16.3	10.4	4.4	5.5	4.3	4.2
1989	100.0	53.5	16.1	10.8	5.0	5.6	4.2	4.9
1990	100.0	53.4	16.2	9.8	5.2	5.9	4.2	5.2
1991	100.0	53.3	16.2	9.0	5.4	6.7	4.3	5.1
1992	100.0	49.9	17.0	10.1	5.6	6.7	4.8	5.9
1993	100.0	53.1	15.8	11.0	5.4	5.5	4.3	4.8
1994	100.0	53.6	16.3	10.5	5.4	5.1	4.2	4.8
1995	100.0	52.9	16.7	10.1	5.7	5.4	4.2	5.0
1996	100.0	55.3	16.3	10.0	5.2	5.3	3.5	4.4
1997	100.0	56.5	16.3	8.5	5.3	4.9	3.9	4.6
1998 (est.)	100.0	57.3	16.2	7.9	5.0	4.7	3.8	5.1
1999 (est.)	100.0	57.4	16.9	8.5	4.7	4.3	3.1	5.0

NOTES: Percentages may not total 100 because of rounding. Academic research includes basic research and applied research.

[a]Data for the National Institutes of Health include the Alcohol, Drug Abuse, and Mental Health Administration.

[b]Data for 1970 to 1973 are for the Atomic Energy Commission; data for 1974 to 1976 are for the Energy Research and Development Administration; data for 1977 and thereafter are for the U.S. Department of Energy.

[c]See appendix table 2-1 for gross domestic product implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, Detailed Statistical Tables, Vol. 47, NSF 99-333 (Arlington, VA: 1999); and NSF, annual series.

See page 6-12 in Volume 1.

Appendix table 6-10.
Distribution of Federal agency academic research obligations, by field: FY 1997
(Percentages)

Field	National Science Foundation	National Aeronautics & Space Administration	Department of Defense	Department of Energy	Department of Health & Human Services	Department of Agriculture
TOTAL SCIENCE & ENGINEERING	100.0	100.0	100.0	100.0	100.0	100.0
Total sciences	79.2	84.7	59.6	87.2	99.3	95.8
Physical sciences	21.6	37.2	11.0	58.5	1.5	6.0
Astronomy	2.1	21.6	0.0	0.0	0.0	0.0
Chemistry	6.9	2.0	4.2	8.2	1.4	6.0
Physics	6.9	10.2	5.8	50.1	0.1	0.0
Other	5.6	3.3	1.0	0.1	0.0	0.0
Mathematics	4.4	0.2	2.3	1.3	0.2	0.0
Computer sciences	10.8	3.6	23.1	0.4	0.2	0.0
Environmental sciences	17.0	29.1	10.3	12.6	0.3	1.1
Atmospheric sciences	3.7	16.1	2.1	3.5	0.0	1.0
Earth sciences	4.5	2.5	0.7	3.8	0.0	0.1
Oceanography	8.2	2.0	5.4	0.7	0.0	0.0
Other	0.7	8.6	2.2	4.6	0.3	0.0
Life sciences	15.9	9.4	10.1	13.1	88.9	76.7
Agricultural sciences	0.0	0.1	0.1	0.0	0.0	39.2
Biology (excluding environmental)	11.8	4.4	4.0	7.6	48.1	20.5
Environmental biology	4.1	0.1	0.5	0.0	0.0	15.2
Medical sciences	0.0	0.9	5.3	5.4	38.0	1.9
Other	0.0	3.8	0.1	0.1	2.9	0.0
Psychology	0.2	0.8	2.2	0.0	3.9	0.0
Biological aspects	0.0	0.0	1.6	0.0	0.2	0.0
Social aspects	0.2	0.0	0.5	0.0	0.1	0.0
Other	0.0	0.8	0.1	0.0	3.7	0.0
Social sciences	4.1	0.0	0.0	0.0	1.1	12.0
Anthropology	0.6	0.0	0.0	0.0	0.0	0.0
Economics	0.8	0.0	0.0	0.0	0.0	9.9
Political science	0.3	0.0	0.0	0.0	0.0	0.0
Sociology	0.3	0.0	0.0	0.0	0.0	2.1
Other	2.2	0.0	0.0	0.0	1.1	0.0
Other sciences	5.2	4.2	0.5	1.1	3.2	0.0
Total engineering	20.8	15.3	40.4	12.8	0.7	4.2
Aeronautical	0.0	5.8	1.6	0.0	0.0	0.0
Astronautical	0.0	1.9	0.7	0.0	0.0	0.0
Chemical	2.1	0.3	0.7	2.9	0.0	0.1
Civil	2.0	0.0	0.6	0.6	0.0	0.0
Electrical	2.3	1.4	10.0	0.4	0.0	0.0
Mechanical	0.4	1.6	5.3	1.8	0.0	0.0
Materials	5.8	2.0	12.6	4.5	0.0	0.0
Other	8.2	2.3	9.1	2.6	0.7	4.1

NOTES: Academic research includes both basic and applied research. The six agencies shown are the only ones that report their research obligations to academia by science and engineering field; they represent approximately 96 percent of academic research obligations.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, Detailed Statistical Tables, Vol. 47, NSF 99-333 (Arlington, VA: 1999); and NSF, annual series.

See figure 6-7 in Volume 1.

Appendix table 6-11.
Percentage of Federal academic research obligations provided by major agencies, by field: FY 1997

Field	Six Agency total	National Science Foundation	National Aeronautics & Space Administration	Department of Defense	Department of Energy	Department of Health & Human Services	Department of Agriculture
TOTAL SCIENCE & ENGINEERING	100.0	16.9	5.5	8.8	5.1	59.7	4.1
Total sciences	100.0	14.7	5.2	5.8	4.9	65.2	4.3
Physical sciences	100.0	33.8	19.1	9.0	27.8	8.2	2.3
Astronomy	100.0	23.2	76.7	0.1	0.0	0.0	0.0
Chemistry	100.0	36.9	3.5	11.6	13.4	27.0	7.7
Physics	100.0	24.1	11.7	10.5	53.0	0.6	0.0
Other	100.0	77.2	15.0	7.3	0.6	0.0	0.0
Mathematics	100.0	66.5	0.9	18.4	6.1	8.1	0.2
Computer sciences	100.0	43.7	4.8	48.3	0.5	2.6	0.0
Environmental sciences	100.0	46.0	25.8	14.5	10.4	2.5	0.7
Atmospheric sciences	100.0	32.4	46.6	9.6	9.4	0.0	2.1
Earth sciences	100.0	65.6	12.2	5.1	16.8	0.0	0.4
Oceanography	100.0	69.1	5.4	23.6	1.9	0.0	0.0
Other	100.0	9.6	40.2	16.5	20.1	13.5	0.0
Life sciences	100.0	4.4	0.9	1.5	1.1	87.1	5.1
Agricultural sciences	100.0	0.0	0.4	0.8	0.0	0.0	98.8
Biology (excluding environmental)	100.0	6.1	0.8	1.1	1.2	88.3	2.6
Environmental biology	100.0	50.7	0.6	3.5	0.0	0.0	45.2
Medical sciences	100.0	0.0	0.2	2.0	1.2	96.3	0.3
Other	100.0	0.0	11.0	0.6	0.2	88.2	0.0
Psychology	100.0	1.5	1.8	7.3	0.0	89.5	0.0
Biological aspects	100.0	0.0	0.0	59.7	0.0	40.3	0.0
Social aspects	100.0	30.4	1.1	32.5	0.0	36.0	0.0
Other	100.0	0.0	2.0	0.4	0.0	97.6	0.0
Social sciences	100.0	37.9	0.1	0.0	0.0	35.4	26.5
Anthropology	100.0	99.7	0.0	0.0	0.0	0.3	0.0
Economics	100.0	24.3	0.0	0.0	0.0	2.1	73.5
Political science	100.0	100.0	0.0	0.0	0.0	0.0	0.0
Sociology	100.0	31.5	0.4	0.1	0.0	5.0	63.1
Other	100.0	36.9	0.1	0.0	0.0	62.9	0.0
Other sciences	100.0	27.8	7.4	1.3	1.9	61.7	0.0
Total engineering	100.0	38.2	9.3	38.7	7.2	4.8	1.8
Aeronautical	100.0	0.0	69.6	30.4	0.0	0.0	0.0
Astronautical	100.0	0.0	64.8	35.2	0.0	0.0	0.0
Chemical	100.0	61.0	2.8	9.8	25.9	0.0	0.4
Civil	100.0	80.0	0.5	12.4	7.0	0.0	0.1
Electrical	100.0	28.3	5.6	64.6	1.4	0.0	0.0
Mechanical	100.0	9.1	12.6	65.2	13.1	0.0	0.0
Materials	100.0	40.3	4.6	45.5	9.5	0.0	0.0
Other	100.0	45.4	4.2	26.2	4.4	14.4	5.4

NOTES: Academic research includes both basic and applied research. The six agencies shown are the only ones that report their research obligations to academia by science and engineering field; they represent approximately 96 percent of academic research obligations.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999,* Detailed Statistical Tables, Vol. 47, NSF 99-333 (Arlington, VA: 1999); and NSF, annual series.

See figure 6-8 in Volume 1.

Appendix table 6-12.
Number of academic institutions receiving Federal R&D support, by selected Carnegie classification: 1971–97

Year	Institutions receiving Federal R&D support		
	All academic institutions	Carnegie research and doctorate-granting institutions	Other Carnegie institutions
1971	563	222	341
1972	618	223	395
1973	534	219	315
1974	547	217	330
1975	556	221	335
1976	572	222	350
1977	618	220	398
1978	675	221	454
1979	665	223	442
1980	684	223	461
1981	621	225	396
1982	589	223	366
1983	602	226	376
1984	603	225	378
1985	648	226	422
1986	650	225	425
1987	738	228	510
1988	683	228	455
1989	712	229	483
1990	748	228	520
1991	775	227	548
1992	837	228	609
1993	889	227	662
1994	903	227	676
1995	891	228	663
1996	836	228	608
1997	832	228	604

NOTES: See "Carnegie Classification of Institutions" in chapter 4 for information on the institutional categories used by the Carnegie Foundation for the Advancement of Teaching. "Other Carnegie institutions" are all Carnegie-classified institutions except research and doctorate-granting institutions.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Support to Universities, Colleges, and Nonprofit Institutions: Fiscal Year 1997*, Detailed Statistical Tables, NSF 99-331 (Arlington, VA: 1999); and NSF, annual series.

See figure 6-9 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 6-13.
Square footage of total, new construction of, and repair/renovation of academic research space, by field: 1986–98
(Thousands of square feet)

Total space

Field	1988	1990	1992	1994	1996	1998
Total, all fields	112,062	116,327	122,015	127,369	136,481	143,000
Physical sciences	16,024	16,121	16,353	17,001	17,872	18,000
Mathematics	722	790	829	937	1,005	1,000
Computer sciences	1,437	1,445	1,606	1,779	2,075	2,000
Earth, atmospheric, and ocean sciences	6,313	6,056	6,728	7,053	7,246	8,000
Agricultural sciences	17,622	20,821	19,910	20,120	22,118	25,000
Biological sciences—universities & colleges	16,072	17,569	17,072	16,982	18,662	19,000
Biological sciences—medical schools	7,838	8,584	10,649	10,876	10,797	12,000
Medical sciences—universities & colleges	5,320	4,959	6,234	6,070	7,402	7,000
Medical sciences—medical schools	14,042	14,762	16,139	16,799	17,727	18,000
Psychology	3,085	2,978	2,984	3,178	3,404	3,000
Social sciences	3,337	3,338	3,253	3,403	3,977	5,000
Other sciences, not elsewhere classified	4,350	1,846	2,162	2,442	2,363	3,000
Engineering	15,900	17,057	18,095	20,730	21,832	23,000

New construction

	1986–87	1988–89	1990–91	1992–93	1994–95	1996–97
Total, all fields	9,922	10,647	11,433	10,992	9,521	11,101
Physical sciences	799	2,000	1,609	1,257	1,551	1,229
Mathematics	9	25	46	44	8	16
Computer sciences	237	286	293	172	143	92
Earth, atmospheric, and ocean sciences	380	324	529	502	282	534
Agricultural sciences	1,513	1,146	955	1,218	808	1,539
Biological sciences—universities & colleges	1,275	1,549	1,374	1,169	1,028	1,216
Biological sciences—medical schools	433	712	1,426	1,020	579	701
Medical sciences—universities & colleges	613	306	673	669	388	733
Medical sciences—medical schools	1,335	1,948	2,288	3,154	1,694	2,652
Psychology	132	115	164	78	145	208
Social sciences	202	329	*	221	380	233
Other sciences, not elsewhere classified	603	418	380	420	340	463
Engineering	2,390	1,490	1,697	1,065	2,174	1,484

Repaired/renovated space

	1986–87	1988–89	1990–91	1992–93	1994–95	1996–97
Total, all fields	13,431	11,449	8,606	9,134	13,122	15,059
Physical sciences	1,746	1,928	1,680	1,725	2,474	2,432
Mathematics	37	136	39	11	67	81
Computer sciences	193	144	164	54	124	160
Earth, atmospheric, and ocean sciences	362	930	450	418	521	430
Agricultural sciences	628	530	391	335	1,245	836
Biological sciences—universities & colleges	2,555	2,203	1,055	1,304	1,610	2,481
Biological sciences—medical schools	1,056	1,259	1,301	864	752	1,527
Medical sciences—universities & colleges	737	705	627	284	757	726
Medical sciences—medical schools	2,499	1,598	1,443	1,678	3,129	2,176
Psychology	256	88	254	141	182	468
Social sciences	181	119	*	236	296	652
Other sciences, not elsewhere classified	465	180	42	152	162	400
Engineering	2,716	1,630	1,159	1,932	1,803	2,691

NA = not available; * = data included with psychology

NOTES: For new construction and repair/renovation, data for two years are combined—for example, 1988-89 refers to two fiscal years. Total R&D space is current actual space reported at the time of the survey. Square footage refers to net assignable square feet (the sum of all areas on all floors of a building assigned to, or available to be assigned to, an occupant for specific use, such as instruction or research). Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Scientific and Engineering Research Facilities at Universities and Colleges: 1998,* in press (Arlington, VA: 2000).

See figure 6-10 in Volume 1.

Appendix table 6-14.
Cost of academic research new construction and repair/renovation projects, by field: 1986–97

Field	Total cost in millions of constant 1995 dollars[a]					
	1986–87 actual	1988–89 actual	1990–91 actual	1992–93 actual	1994–95 actual	1996–97 actual
New construction						
Total, all fields	2,711	3,032	3,537	3,207	2,920	3,110
Physical sciences	241	494	511	384	449	381
Mathematics	2	11	15	12	2	9
Computer sciences	81	80	47	54	49	21
Earth, atmospheric, and ocean sciences	75	100	202	140	35	172
Agricultural sciences	198	187	208	239	158	273
Biological sciences—universities & colleges	428	487	536	333	409	404
Biological sciences—medical schools	184	223	453	389	238	178
Medical sciences—universities & colleges	268	75	179	183	129	259
Medical sciences—medical schools	399	722	779	957	554	784
Psychology	31	31	43	18	44	77
Social sciences	51	59	*	51	118	75
Other sciences, not elsewhere classified	184	87	95	117	129	145
Engineering	568	478	469	326	607	332
Repair/renovation						
Total, all fields	1,108	1,243	982	955	1,116	1,325
Physical sciences	139	203	179	153	203	244
Mathematics	5	14	6	2	6	5
Computer sciences	23	12	25	4	8	12
Earth, atmospheric, and ocean sciences	27	22	19	36	37	52
Agricultural sciences	26	28	41	16	76	50
Biological sciences—universities & colleges	193	155	160	123	134	200
Biological sciences—medical schools	102	94	146	132	107	164
Medical sciences—universities & colleges	69	30	62	32	62	76
Medical sciences—medical schools	230	198	197	267	238	196
Psychology	18	14	37	12	30	65
Social sciences	47	11	*	12	42	40
Other sciences, not elsewhere classified	40	20	6	8	13	11
Engineering	186	445	97	158	158	208

* = data included with psychology

NOTES: Data for two years are combined—for example, 1988-89 refers to two fiscal years. Current dollars have been adjusted to 1997 constant dollars using the U.S. Bureau of the Census's Composite Fixed-Weighted Price Index for Construction. Details may not add to totals because of rounding.

[a] Project cost estimates are prorated to reflect R&D component only.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Scientific and Engineering Research Facilities at Universities and Colleges: 1998,* in press (Arlington, VA: 2000).

See page 6-15 in Volume 1.

Appendix table 6-15.
Expected costs of deferred S&E research facility construction and repair/renovation needs, by field: 1998
(Millions of current dollars)

Field	Total, all needs			In a plan[a]		Not in a plan[a]	
	Construction & repair/renovation	Construction	Repair/ renovation	Construction	Repair/ renovation	Construction	Repair/ renovation
Total science & engineering	11,381	6,999	4,382	5,857	2,834	1,142	1,548
Physical sciences	2,453	1,551	901	1,339	596	212	305
Mathematics	182	88	94	83	75	5	19
Computer sciences	297	236	60	198	25	38	35
Earth, atmospheric, and ocean sciences	545	398	148	327	106	71	42
Agricultural sciences	768	486	282	422	165	64	117
Biological sciences—universities & colleges	2,102	1,249	853	976	505	273	348
Biological sciences—medical schools	541	307	234	267	160	40	74
Medical sciences—universities & colleges	707	404	303	333	129	71	174
Medical sciences—medical schools	1,256	798	458	689	274	109	184
Psychology	242	137	104	107	71	30	33
Social sciences	357	180	177	136	110	44	67
Other sciences	188	120	68	102	62	18	6
Engineering	1,744	1,044	700	878	556	166	144

NOTE: Details may not add to totals because of rounding.

[a] This refers to whether the deferred need is included (or not included) in a formal institutional plan.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Scientific and Engineering Research Facilities at Universities and Colleges: 1998,* in press (Arlington, VA: 2000).

See page 6-18 in Volume 1.

Appendix table 6-16.
Current fund expenditures for research equipment at academic institutions, by field: 1981–97

Field	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
	Millions of current dollars																
TOTAL SCIENCE & ENGINEERING	412	426	450	537	672	783	837	912	986	1,012	1,024	1,033	1,039	1,105	1,235	1,208	1,277
Total science	341	356	371	447	547	637	659	716	784	792	790	808	821	856	966	927	979
Physical sciences	77	81	81	104	142	163	166	181	181	191	189	198	207	207	237	234	238
Astronomy	5	5	4	6	7	6	7	7	10	13	14	14	17	20	23	21	26
Chemistry	35	34	32	42	54	59	66	74	76	73	69	70	75	80	81	90	88
Physics	33	34	37	47	71	89	82	85	83	91	88	94	90	88	113	104	105
Other	4	7	8	8	10	9	12	15	12	14	18	20	26	19	22	20	20
Mathematics	3	4	4	5	6	7	10	10	10	10	11	10	15	15	14	13	15
Computer sciences	15	18	20	22	35	43	43	43	43	48	59	45	54	59	76	67	70
Environmental sciences	30	28	31	41	48	51	55	56	67	72	70	78	76	83	81	88	90
Atmospheric sciences	6	4	5	7	8	10	11	10	13	11	10	11	14	11	13	13	14
Earth sciences	12	11	12	16	18	18	20	19	26	27	29	30	27	31	27	30	34
Oceanography	9	9	11	14	16	18	17	19	18	20	19	28	24	26	26	28	29
Other	5	4	3	4	5	6	7	7	11	13	12	9	11	15	15	16	12
Life sciences	196	203	209	243	283	331	335	379	431	420	411	429	417	435	464	444	479
Agricultural sciences	38	41	41	42	52	58	49	52	59	54	53	59	53	68	63	62	70
Biological sciences	73	75	74	89	105	120	130	155	175	171	167	174	170	176	192	181	196
Medical sciences	78	80	87	103	114	138	142	156	177	177	169	175	177	172	186	182	197
Other	7	7	7	9	12	15	14	16	20	19	22	21	16	18	22	18	16
Psychology	6	6	7	7	9	9	11	10	11	11	11	11	15	13	12	12	13
Social sciences	8	8	9	14	10	14	12	12	14	15	14	18	19	21	28	25	25
Economics	2	2	2	3	3	4	3	4	4	4	5	5	5	6	8	6	5
Political science	1	1	1	1	1	1	1	1	2	1	2	2	3	3	3	3	3
Sociology	2	2	1	2	2	2	2	2	3	3	3	3	4	4	4	4	4
Other	3	3	5	8	4	7	5	4	6	7	5	7	8	9	13	11	12
Other sciences	7	9	10	10	15	20	27	26	26	25	25	18	18	23	53	44	50
Total engineering	71	70	80	90	124	146	178	195	202	220	234	225	218	248	269	281	298
Aeronautical/astronautical	3	4	3	4	7	8	9	9	11	13	17	12	13	19	16	16	19
Bioengineering/biomedical	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Chemical	8	7	6	7	11	14	15	15	19	18	20	20	22	19	22	24	23
Civil	6	6	7	7	10	12	12	17	16	20	18	16	18	18	22	25	27
Electrical/electronic	17	19	23	24	33	36	44	44	49	58	52	57	56	66	68	75	83
Mechanical	10	8	11	15	17	19	25	29	29	32	34	31	35	37	42	42	46
Materials	0	0	0	0	0	0	0	0	0	27	33	29	23	25	28	32	36
Other	27	27	29	32	46	58	75	81	78	51	59	61	51	65	72	67	60

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-16.
Current fund expenditures for research equipment at academic institutions, by field: 1981–97

Field	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
	Millions of constant 1992 dollars[a]																
TOTAL SCIENCE & ENGINEERING	633	611	618	709	857	971	1,009	1,063	1,103	1,087	1,054	1,033	1,013	1,051	1,147	1,101	1,142
Total science	524	510	509	590	698	790	794	835	877	851	813	808	800	815	897	845	875
Physical sciences	118	116	111	137	181	202	200	211	202	205	195	198	202	197	220	213	213
Astronomy	7	7	6	8	9	7	8	8	11	14	15	14	16	19	21	19	23
Chemistry	54	48	44	56	69	73	79	86	84	78	71	70	73	76	75	82	78
Physics	50	49	50	62	91	111	98	99	93	98	91	94	87	84	105	94	94
Other	7	10	10	11	12	11	15	18	14	15	18	20	25	18	20	18	17
Mathematics	4	5	5	7	8	8	12	11	11	11	11	10	15	14	13	12	13
Computer sciences	23	25	27	29	45	53	52	50	48	52	60	45	52	56	71	61	62
Environmental sciences	47	40	43	54	61	64	67	65	75	77	72	78	74	79	75	80	80
Atmospheric sciences	9	6	7	9	11	12	14	12	14	12	11	11	14	11	13	12	12
Earth sciences	18	15	16	21	23	22	25	22	29	29	30	30	26	29	25	28	31
Oceanography	13	13	16	19	21	22	20	22	20	21	20	28	23	25	24	25	26
Other	7	6	4	5	7	7	8	9	13	14	12	9	11	14	14	15	11
Life sciences	300	291	287	321	361	410	404	442	482	451	423	429	406	414	431	404	428
Agricultural sciences	58	59	56	55	66	72	59	61	66	57	55	59	52	65	59	57	62
Biological sciences	113	108	101	118	134	149	156	181	196	183	172	174	166	168	179	165	175
Medical sciences	120	115	120	136	146	172	171	182	198	190	174	175	173	164	173	166	176
Other	10	9	10	12	15	18	17	18	23	20	22	21	15	17	21	17	14
Psychology	9	8	9	10	11	11	13	11	12	12	11	11	15	12	11	11	12
Social sciences	12	11	13	18	13	17	14	14	16	16	14	18	19	20	26	23	22
Economics	2	3	3	4	4	5	3	5	5	4	5	5	4	5	7	6	5
Political science	2	1	1	1	2	2	2	1	2	2	2	2	3	3	3	3	3
Sociology	3	3	2	3	3	3	3	2	3	3	3	3	4	4	4	4	4
Other	4	4	7	11	5	9	7	5	6	7	5	7	8	9	12	10	11
Other sciences	11	13	14	14	19	25	32	30	30	27	26	18	18	22	49	40	44
Total engineering	109	101	109	119	159	181	215	228	226	236	241	225	212	236	250	256	266
Aeronautical/astronautical	5	5	5	6	8	9	10	11	13	14	18	12	13	18	15	14	17
Bioengineering/biomedical	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Chemical	12	10	8	10	15	17	18	18	22	19	21	20	21	18	20	22	21
Civil	9	9	10	9	13	15	14	20	17	22	18	16	18	17	20	23	24
Electrical/electronic	26	27	31	32	42	45	53	51	54	63	54	57	54	63	63	69	74
Mechanical	16	12	15	20	22	24	30	34	33	35	35	31	34	35	39	38	41
Materials	0	0	0	0	0	0	0	0	0	29	34	29	23	24	26	29	32
Other	41	38	40	43	59	72	90	94	87	55	61	61	50	62	67	61	54

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-16.
Current fund expenditures for research equipment at academic institutions, by field: 1981–97

Field	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
									Percentage								
TOTAL SCIENCE & ENGINEERING	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total science	82.8	83.5	82.3	83.2	81.5	81.4	78.7	78.6	79.5	78.3	77.2	78.2	79.0	77.5	78.2	76.7	76.7
Physical sciences	18.7	18.9	17.9	19.3	21.1	20.8	19.9	19.9	18.3	18.9	18.5	19.2	19.9	18.7	19.2	19.4	18.7
Astronomy	1.1	1.2	0.9	1.1	1.0	0.7	0.8	0.7	1.0	1.3	1.4	1.4	1.6	1.8	1.8	1.7	2.0
Chemistry	8.6	7.9	7.2	7.9	8.0	7.5	7.9	8.1	7.7	7.2	6.8	6.8	7.2	7.2	6.5	7.5	6.9
Physics	8.0	8.1	8.1	8.8	10.6	11.4	9.7	9.4	8.4	9.0	8.6	9.1	8.6	8.0	9.1	8.6	8.2
Other	1.1	1.7	1.7	1.5	1.4	1.1	1.5	1.7	1.2	1.4	1.8	1.9	2.5	1.7	1.7	1.6	1.5
Mathematics	0.6	0.9	0.8	1.0	0.9	0.9	1.2	1.1	1.0	1.0	1.0	1.0	1.5	1.3	1.2	1.1	1.2
Computer sciences	3.6	4.1	4.4	4.1	5.3	5.4	5.1	4.7	4.4	4.7	5.7	4.4	5.2	5.3	6.2	5.6	5.4
Environmental sciences	7.4	6.6	6.9	7.7	7.1	6.5	6.6	6.1	6.8	7.1	6.8	7.5	7.3	7.5	6.6	7.2	7.0
Atmospheric sciences	NA	NA	NA	1.3	1.2	1.3	1.3	1.1	1.3	1.1	1.0	1.1	1.4	1.0	1.1	1.1	1.1
Earth sciences	NA	NA	NA	2.9	2.7	2.3	2.4	2.1	2.6	2.7	2.8	2.9	2.6	2.8	2.2	2.5	2.7
Oceanography	NA	NA	NA	2.7	2.4	2.3	2.0	2.1	1.8	2.0	1.8	2.7	2.3	2.4	2.1	2.3	2.3
Other	1.1	0.9	0.7	0.8	0.8	0.7	0.8	0.8	1.2	1.3	1.2	0.9	1.1	1.3	1.2	1.4	1.0
Life sciences	47.4	47.7	46.4	45.3	42.1	42.2	40.1	41.6	43.7	41.5	40.2	41.5	40.1	39.4	37.6	36.7	37.5
Agricultural sciences	9.1	9.7	9.1	7.8	7.7	7.4	5.9	5.7	6.0	5.3	5.2	5.7	5.1	6.2	5.1	5.2	5.5
Biological sciences	17.8	17.7	16.4	16.6	15.6	15.3	15.5	17.0	17.8	16.8	16.3	16.8	16.4	16.0	15.6	15.0	15.4
Medical sciences	18.9	18.8	19.4	19.2	17.0	17.7	17.0	17.1	17.9	17.5	16.5	17.0	17.0	15.6	15.0	15.1	15.4
Other	1.6	1.5	1.6	1.7	1.7	1.9	1.7	1.7	2.1	1.9	2.1	2.0	1.5	1.6	1.8	1.5	1.2
Psychology	1.4	1.3	1.4	1.4	1.3	1.1	1.3	1.1	1.1	1.1	1.1	1.1	1.5	1.2	1.0	1.0	1.0
Social sciences	1.9	1.9	2.1	2.6	1.5	1.8	1.4	1.3	1.5	1.5	1.4	1.7	1.8	1.9	2.2	2.1	2.0
Economics	0.4	0.5	0.5	0.5	0.4	0.5	0.3	0.5	0.4	0.4	0.4	0.5	0.4	0.5	0.6	0.5	0.4
Political science	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Sociology	0.5	0.6	0.3	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3
Other	0.6	0.6	1.1	1.5	0.6	0.9	0.7	0.5	0.6	0.7	0.5	0.7	0.8	0.8	1.0	0.9	0.9
Other sciences	1.8	2.1	2.3	1.9	2.2	2.6	3.2	2.8	2.7	2.5	2.5	1.8	1.7	2.1	4.3	3.7	3.9
Total engineering	17.2	16.5	17.7	16.8	18.5	18.6	21.3	21.4	20.5	21.7	22.8	21.8	21.0	22.5	21.8	23.3	23.3
Aeronautical/astronautical	NA	NA	NA	0.8	1.0	1.0	1.0	1.0	1.1	1.2	1.7	1.1	1.3	1.7	1.3	1.3	1.5
Bioengineering/biomedical	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.3
Chemical	NA	NA	NA	1.4	1.7	1.8	1.8	1.7	2.0	1.8	1.9	1.9	2.1	1.7	1.8	2.0	1.8
Civil	NA	NA	NA	1.3	1.6	1.5	1.4	1.9	1.6	2.0	1.7	1.5	1.8	1.6	1.8	2.1	2.1
Electrical/electronic	NA	NA	NA	4.5	4.9	4.6	5.2	4.8	4.9	5.8	5.1	5.5	5.4	6.0	5.5	6.2	6.5
Mechanical	NA	NA	NA	2.8	2.6	2.4	3.0	3.2	3.0	3.2	3.3	3.0	3.3	3.3	3.4	3.5	3.6
Materials	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.7	3.2	2.8	2.3	2.3	2.3	2.7	2.8
Other	6.5	6.2	6.5	6.0	6.8	7.4	8.9	8.9	7.9	5.1	5.8	5.9	4.9	5.9	5.8	5.6	4.7

NA = not available

[a]See appendix table 2-1 for gross domestic product implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Academic Research and Development Expenditures: Fiscal Year 1997*, Detailed Statistical Tables, NSF 99-336 (Arlington, VA: 1999); and NSF, special tabulations.

See figure 6-11 in Volume 1.

Appendix table 6-17.
Current funds expenditures for research equipment federally financed, by field: 1981–97
(Percentages)

Field	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
TOTAL SCIENCE & ENGINEERING	63.4	64.4	62.3	63.7	64.4	64.0	62.9	63.2	60.4	59.9	59.6	59.8	61.2	60.5	59.1	59.4	58.6
Total sciences	63.9	64.4	61.6	63.7	64.7	65.3	63.9	64.0	61.0	60.1	60.1	60.8	61.9	60.3	58.6	58.8	59.3
Physical sciences	77.0	79.3	78.8	79.9	79.8	80.1	78.5	78.7	73.7	75.3	73.5	76.5	74.2	73.2	74.8	73.2	71.2
Astronomy	70.4	76.8	84.0	74.3	69.3	70.1	75.1	76.5	69.3	63.2	61.7	69.0	65.3	63.4	61.1	70.1	64.7
Chemistry	72.6	73.9	71.7	76.1	76.7	73.1	74.1	77.5	70.3	71.5	68.2	72.1	70.6	69.3	70.7	69.9	66.7
Physics	81.5	84.2	83.4	84.3	84.5	85.8	82.2	79.7	78.3	81.1	79.0	80.8	75.8	79.5	81.9	77.2	76.3
Other	84.8	83.1	84.4	77.9	70.9	75.7	80.1	79.9	66.6	69.5	76.8	76.9	84.6	71.1	67.5	71.3	71.9
Mathematics	70.5	71.1	66.4	76.7	82.1	76.1	77.6	78.0	67.6	65.9	62.8	68.4	75.1	72.3	63.6	74.2	56.3
Computer sciences	64.2	75.5	72.7	75.7	83.0	82.5	79.3	81.3	71.9	65.8	74.6	65.7	69.8	68.8	63.0	71.0	68.1
Environmental sciences	59.9	63.6	61.7	71.0	67.6	68.1	64.9	65.7	66.1	65.8	61.3	67.0	70.6	72.2	68.5	68.0	73.0
Atmospheric sciences	60.5	71.3	71.3	74.5	84.2	81.3	79.7	78.6	65.1	76.8	75.8	78.0	78.0	81.8	71.8	64.1	77.5
Earth sciences	58.3	59.1	54.9	62.8	56.3	54.7	51.8	58.0	63.1	56.9	53.2	58.3	61.3	67.3	60.9	65.3	69.7
Oceanography	68.4	68.4	63.7	80.3	74.0	77.6	74.9	72.3	74.7	75.0	71.6	75.9	79.6	78.2	74.8	81.1	75.0
Other	47.5	55.9	63.5	64.2	60.6	57.2	55.2	51.5	60.5	61.2	52.1	55.7	64.3	64.5	67.9	54.1	72.5
Life sciences	60.2	58.4	54.9	56.5	55.6	57.0	56.0	56.7	55.2	53.2	53.6	53.7	54.3	52.2	48.6	49.9	50.0
Agricultural sciences	32.5	29.3	26.8	32.3	29.1	31.1	31.8	31.4	30.9	28.4	30.6	36.5	36.7	35.1	31.8	29.0	30.8
Biological sciences	69.6	68.6	66.0	67.6	67.3	66.9	64.5	64.8	62.9	60.1	60.4	61.0	60.8	60.4	56.0	58.4	55.6
Medical sciences	64.5	63.5	58.5	56.4	57.4	59.5	57.5	57.5	55.4	54.3	54.4	53.4	54.1	51.8	48.2	49.9	51.4
Other	62.4	60.5	58.2	58.7	49.1	54.8	47.6	53.0	56.8	50.6	50.8	44.4	45.8	41.6	34.8	36.9	47.7
Psychology	72.3	70.8	69.7	68.2	71.4	67.6	76.5	68.4	65.2	63.6	64.4	63.9	68.7	60.9	64.5	62.9	64.1
Social sciences	43.4	37.9	32.9	28.2	40.0	30.4	29.3	27.9	33.6	32.5	36.6	43.2	40.1	41.1	38.6	39.8	37.7
Economics	27.3	35.7	40.4	44.9	35.6	31.3	28.9	18.1	25.8	27.2	33.8	48.8	40.2	43.7	37.1	40.0	29.7
Political science	50.8	35.5	36.9	39.2	32.1	26.2	26.8	36.8	23.0	24.4	32.0	45.7	30.5	48.4	35.2	32.1	34.3
Sociology	56.2	38.7	59.6	54.6	53.5	42.1	37.5	40.8	38.0	43.2	52.6	52.1	52.3	43.8	45.9	49.5	44.6
Other	38.5	39.4	21.4	14.8	39.0	27.0	26.9	29.7	39.8	32.9	32.4	33.7	37.9	35.9	37.9	38.4	39.7
Other sciences	55.8	63.7	59.8	54.3	46.1	58.4	51.1	46.5	49.6	46.1	38.3	28.4	41.3	42.9	59.7	39.8	65.6
Total engineering	61.1	64.2	65.3	63.6	62.9	58.4	59.1	60.3	57.9	58.9	57.9	56.3	58.8	61.0	60.9	61.3	56.2
Aeronautical/astronautical	75.1	66.1	76.7	75.3	75.0	74.1	74.7	76.6	76.8	81.1	83.8	75.1	81.3	76.3	76.8	70.3	69.8
Bioengineering/biomedical	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	52.5
Chemical	66.6	62.9	58.1	53.9	58.7	58.8	53.6	54.0	52.2	46.1	49.0	50.6	46.8	58.2	59.0	56.9	55.0
Civil	49.4	48.0	51.5	55.8	58.5	50.8	57.6	61.2	55.5	58.7	46.7	44.9	44.6	44.1	43.8	44.1	43.9
Electrical/electronic	70.1	75.5	71.1	68.4	68.5	66.0	69.0	66.5	60.8	61.8	58.2	59.4	65.9	66.6	61.9	68.4	60.8
Mechanical	61.5	60.4	68.5	70.0	65.1	61.6	63.9	66.4	57.2	56.8	51.8	60.1	64.6	65.9	63.9	63.2	62.5
Materials	NA	NA	NA	NA	NA	NA	NA	NA	NA	66.5	59.7	48.8	50.9	48.6	50.5	52.6	51.3
Other	54.3	61.4	63.2	59.3	58.5	52.0	51.1	53.9	55.6	52.2	59.0	56.2	55.1	58.3	64.3	62.3	49.7

NA = not available

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Academic Research and Development Expenditures: Fiscal Year 1997*, Detailed Statistical Tables, NSF 99-336 (Arlington, VA: 1999); and NSF, special tabulations.

See page 6-19 in Volume 1.

Appendix table 6-18.
Current fund expenditures for research equipment at academic institutions as a percentage of total R&D expenditures, by field: 1981–97
(Percentages)

Field	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
TOTAL SCIENCE & ENGINEERING	6.0	5.8	5.7	6.2	6.9	7.2	6.9	6.8	6.6	6.2	5.8	5.5	5.2	5.2	5.6	5.2	5.2
Total sciences	5.8	5.6	5.5	6.0	6.6	6.9	6.4	6.3	6.2	5.8	5.4	5.1	4.9	4.8	5.2	4.8	4.8
Physical sciences	10.1	9.8	9.0	10.3	12.4	12.7	11.9	11.7	11.0	10.6	9.8	9.6	9.7	9.5	10.5	10.4	10.1
Astronomy	6.8	7.1	5.7	7.3	7.3	5.7	6.0	5.4	7.3	7.8	6.8	5.9	6.5	7.4	7.3	7.6	9.1
Chemistry	12.4	10.9	9.7	11.4	12.8	12.5	12.8	13.1	12.5	11.3	10.3	9.9	10.1	10.5	10.4	11.3	10.8
Physics	9.2	9.4	8.8	9.9	12.9	14.2	12.1	11.5	10.6	10.8	10.0	10.2	9.5	9.3	11.5	10.5	10.0
Other	7.9	9.7	10.1	11.1	12.0	10.5	11.8	12.4	10.4	9.5	10.2	10.4	13.6	9.9	11.3	10.1	9.3
Mathematics	3.0	3.8	3.5	4.3	4.7	4.5	5.5	4.9	4.8	4.6	4.6	4.2	5.6	5.2	5.1	4.4	5.1
Computer sciences	10.4	10.7	10.7	9.9	12.6	13.3	11.5	10.5	9.1	9.3	10.6	8.1	8.8	9.1	11.1	9.7	9.7
Environmental sciences	5.5	5.0	5.0	6.4	6.8	6.6	6.6	6.2	6.7	6.8	6.3	6.3	5.8	5.9	5.6	5.8	5.8
Atmospheric sciences	6.5	5.1	5.3	6.7	7.7	8.3	8.5	7.2	7.6	6.6	5.9	5.6	6.9	5.5	6.4	5.8	5.9
Earth sciences	6.2	5.5	5.3	6.9	7.2	6.5	7.2	6.6	7.9	7.7	7.5	7.3	6.4	6.7	5.7	6.7	7.6
Oceanography	4.5	4.6	5.1	6.1	6.3	6.4	5.6	5.7	5.0	5.3	4.9	6.4	5.2	5.7	5.5	5.1	5.3
Other	5.7	5.0	3.8	5.2	6.0	5.6	5.7	5.8	7.3	8.2	7.1	4.4	4.9	5.2	5.0	5.7	4.2
Life sciences	5.3	5.1	4.9	5.2	5.4	5.6	5.1	5.2	5.3	4.8	4.3	4.2	3.8	3.8	3.8	3.5	3.5
Agricultural sciences	4.8	4.8	4.4	4.4	5.2	5.3	4.4	4.5	4.6	4.0	3.6	3.9	3.4	4.1	3.5	3.3	3.5
Biological sciences	6.2	5.9	5.2	5.7	5.9	6.2	6.0	6.4	6.6	6.0	5.5	5.3	4.8	4.7	5.0	4.6	4.6
Medical sciences	4.9	4.6	4.8	5.1	4.9	5.3	4.7	4.6	4.6	4.3	3.7	3.5	3.3	3.1	3.1	2.8	2.9
Other	5.9	5.3	5.4	5.9	6.5	6.1	5.5	5.3	6.3	5.2	5.4	5.0	3.7	4.0	4.8	3.6	3.0
Psychology	4.5	4.4	4.8	5.0	5.5	5.1	5.6	4.5	4.6	4.2	3.9	3.4	4.4	3.6	3.3	3.2	3.4
Social sciences	2.1	2.2	2.7	3.9	2.6	3.0	2.4	2.1	2.3	2.1	1.9	2.2	2.1	2.3	2.7	2.3	2.2
Economics	1.5	2.0	2.2	2.5	2.3	2.7	1.9	2.7	2.2	2.0	2.2	2.3	2.0	2.3	3.0	2.4	2.1
Political science	2.6	1.4	1.6	2.0	2.0	2.0	1.6	1.1	1.6	1.3	1.6	1.7	1.9	1.8	1.9	1.9	1.9
Sociology	2.2	3.0	1.8	2.7	2.6	2.3	2.2	2.0	2.5	2.2	1.7	2.1	2.0	2.0	1.9	1.8	1.7
Other	2.3	2.3	4.4	6.5	3.2	4.3	3.1	2.3	2.6	2.6	1.9	2.4	2.4	2.6	3.4	2.7	2.8
Other sciences	5.0	5.8	6.3	5.7	7.9	8.8	10.5	9.0	8.3	7.5	7.6	5.9	4.9	5.8	12.3	10.6	9.9
Total engineering	7.3	6.9	7.1	7.3	8.8	8.9	9.4	9.3	8.4	8.3	8.1	7.3	6.9	7.4	7.7	7.6	7.8
Aeronautical/astronautical	6.0	5.7	5.0	6.2	8.2	8.0	7.9	7.4	7.5	7.7	9.7	5.9	6.2	8.6	6.7	6.7	7.7
Bioengineering/biomedical	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.9
Chemical	9.1	8.2	6.3	7.3	9.8	10.6	9.9	9.4	10.0	8.3	8.2	7.6	7.9	6.7	7.4	7.5	7.3
Civil	5.2	5.3	5.7	4.9	6.8	6.6	6.1	7.7	6.4	7.1	5.7	4.6	5.0	4.6	5.1	5.5	5.9
Electrical/electronic	8.8	8.5	8.6	8.2	9.7	9.1	9.7	8.6	8.2	8.8	7.7	8.1	8.0	8.9	8.3	8.5	8.8
Mechanical	7.3	5.9	7.5	8.3	8.4	8.3	9.2	9.6	8.5	8.3	8.1	6.9	7.2	7.4	8.0	8.1	8.8
Materials	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.9	10.9	9.7	7.8	8.1	8.5	9.2	9.3
Other	7.0	6.7	6.9	7.2	8.8	9.4	10.4	10.5	9.0	7.7	7.8	7.4	6.2	7.2	8.2	7.1	6.9

NA = not available

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Academic Research and Development Expenditures: Fiscal Year 1997*, Detailed Statistical Tables, NSF 99-336 (Arlington, VA: 1999); and NSF, special tabulations.

See page 6-19 in Volume 1.

Appendix table 6-19.
Academic employment of doctoral scientists and engineers, by type of position and field: 1973–97
(Thousands)

Field	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
						Total							
Total science & engineering	118.0	134.1	145.5	155.4	167.1	176.2	190.3	196.0	206.7	210.6	213.8	217.5	232.5
Total sciences	105.6	120.7	130.7	139.5	151.0	158.1	170.4	174.8	183.9	187.8	190.6	193.7	205.9
Physical sciences	22.1	23.6	25.0	24.6	25.4	25.1	27.0	27.2	27.7	27.7	28.6	29.3	30.2
Mathematics	9.7	11.0	11.7	12.2	12.4	12.9	13.6	13.8	14.5	15.2	15.5	14.6	15.6
Computer sciences	NA	NA	NA	0.1	0.3	0.5	0.8	1.1	1.5	2.0	2.5	3.1	3.3
Environmental sciences	3.4	3.9	4.2	4.2	4.6	4.8	5.2	5.6	5.9	6.0	6.4	6.4	7.3
Life sciences	34.9	39.4	42.6	47.0	51.3	54.9	58.7	61.3	64.8	66.9	68.2	71.6	77.3
Psychology	12.2	14.8	16.2	17.7	20.1	21.0	23.1	23.7	25.0	25.2	25.0	26.1	27.3
Social sciences	23.4	28.0	31.1	33.6	36.9	38.9	42.0	42.2	44.5	44.8	44.4	42.5	44.9
Engineering	12.4	13.4	14.8	15.8	16.1	18.1	19.9	21.2	22.9	22.8	23.1	23.8	26.6
						Total full-time faculty							
Total science & engineering	103.3	116.4	125.6	131.2	142.0	148.4	156.9	164.5	169.8	173.1	172.4	171.4	178.4
Total sciences	92.0	104.2	112.2	116.9	127.3	132.0	139.0	145.2	149.6	153.1	152.3	151.3	156.8
Physical sciences	17.8	18.9	20.0	20.0	20.5	20.2	21.2	22.0	21.5	21.7	21.3	20.9	21.4
Mathematics	9.3	10.4	10.9	11.4	11.7	12.3	12.7	12.9	13.5	14.2	14.7	13.0	13.6
Computer sciences	NA	NA	NA	0.1	0.3	0.4	0.7	0.9	1.3	1.8	2.3	2.8	3.0
Environmental sciences	3.0	3.4	3.6	3.5	3.8	4.0	4.2	4.4	4.7	4.5	4.5	4.7	5.1
Life sciences	29.5	33.1	34.9	37.3	40.9	43.5	45.6	48.1	49.3	51.1	50.8	52.8	55.2
Psychology	10.8	12.8	13.9	14.3	16.4	17.3	18.5	19.2	20.2	20.7	19.5	20.1	20.8
Social sciences	21.6	25.5	28.8	30.4	33.7	34.4	36.1	37.7	39.0	39.0	39.2	37.1	37.7
Engineering	11.3	12.2	13.5	14.3	14.7	16.4	17.9	19.3	20.2	20.1	20.1	20.0	21.5
						Full-time senior faculty							
Total science & engineering	74.0	84.3	90.7	97.2	107.4	115.6	119.8	127.3	131.1	133.0	128.6	127.3	131.9
Total sciences	65.3	74.5	80.0	85.6	95.0	101.9	105.9	112.0	115.2	117.2	113.0	112.1	115.4
Physical sciences	13.0	14.6	15.3	16.0	16.9	17.1	17.7	18.3	17.8	17.6	16.9	16.4	16.7
Mathematics	5.9	6.9	7.6	8.3	9.1	9.7	10.0	10.5	10.9	11.8	11.5	10.6	10.8
Computer sciences	NA	NA	NA	0.0	0.0	0.1	0.1	0.3	0.4	0.9	0.9	1.7	1.7
Environmental sciences	2.2	2.5	2.7	2.8	2.9	3.1	3.1	3.2	3.6	3.6	3.7	3.6	3.8
Life sciences	21.0	23.4	24.6	27.0	29.6	32.6	33.7	35.8	36.4	37.4	35.8	37.2	38.3
Psychology	7.3	8.7	9.1	9.9	11.7	12.8	13.5	14.3	15.0	15.3	14.3	14.5	15.3
Social sciences	15.9	18.5	20.7	21.7	24.9	26.4	27.7	29.5	31.1	30.6	29.9	28.1	28.8
Engineering	8.7	9.7	10.7	11.6	12.4	13.7	13.9	15.3	15.9	15.8	15.7	15.3	16.6
						Full-time junior faculty							
Total science & engineering	29.3	32.1	34.9	34.0	34.6	32.8	37.2	37.2	38.7	40.1	43.8	44.0	46.4
Total sciences	26.7	29.6	32.2	31.3	32.3	30.2	33.1	33.2	34.4	35.8	39.3	39.3	41.5
Physical sciences	4.8	4.3	4.8	4.0	3.7	3.1	3.5	3.6	3.7	4.1	4.3	4.5	4.8
Mathematics	3.3	3.5	3.3	3.1	2.6	2.5	2.7	2.4	2.6	2.4	3.2	2.4	2.8
Computer sciences	NA	NA	NA	0.1	0.2	0.3	0.6	0.6	0.9	1.0	1.4	1.2	1.3
Environmental sciences	0.8	0.9	0.9	0.7	0.9	0.9	1.1	1.1	1.1	0.9	0.9	1.1	1.3
Life sciences	8.5	9.7	10.3	10.3	11.3	10.8	11.9	12.3	12.8	13.7	15.0	15.6	16.9
Psychology	3.6	4.2	4.8	4.4	4.8	4.5	5.0	4.9	5.2	5.4	5.2	5.5	5.5
Social sciences	5.7	7.1	8.2	8.6	8.8	8.1	8.4	8.2	7.9	8.4	9.3	9.0	8.9
Engineering	2.6	2.5	2.7	2.8	2.3	2.7	4.0	4.0	4.3	4.3	4.5	4.8	5.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-19.
Academic employment of doctoral scientists and engineers, by type of position and field: 1973–97
(Thousands)

Field	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
All other full-time positions													
Total science & engineering	7.6	8.3	8.8	11.4	12.6	13.4	18.1	16.4	19.2	20.2	22.2	23.8	26.4
Total sciences	6.8	7.4	8.0	10.5	11.5	12.3	16.6	15.3	17.7	18.4	20.7	21.7	23.3
Physical sciences	1.9	1.9	2.1	2.0	2.4	2.5	3.0	2.6	3.3	3.2	3.7	3.8	4.6
Mathematics	0.2	0.3	0.4	0.4	0.4	0.3	0.5	0.4	0.5	0.6	0.5	0.6	0.8
Computer sciences	NA	NA	NA	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
Environmental sciences	0.3	0.3	0.3	0.5	0.5	0.5	0.7	0.8	0.7	0.9	1.1	1.1	1.4
Life sciences	2.5	2.4	2.8	3.9	4.0	4.6	6.2	6.0	6.7	7.2	7.7	8.4	8.4
Psychology	0.8	1.0	1.2	1.8	2.2	2.2	2.9	2.8	2.9	2.8	3.9	3.9	4.0
Social sciences	1.0	1.5	1.2	1.9	2.0	2.2	3.2	2.6	3.5	3.5	3.7	3.6	3.9
Engineering	0.8	0.9	0.8	0.9	1.1	1.1	1.5	1.1	1.5	1.8	1.5	2.1	3.1
Postdoctoral positions													
Total science & engineering	4.2	6.2	7.6	8.1	8.5	8.3	8.7	9.3	11.5	9.9	13.3	16.8	18.9
Total sciences	4.0	5.9	7.2	7.8	8.4	8.0	8.5	8.8	10.9	9.4	12.3	15.6	17.2
Physical sciences	1.7	2.1	2.2	1.9	1.9	1.4	1.9	2.0	2.4	1.9	3.0	3.9	3.2
Mathematics	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.0	0.5	0.5
Computer sciences	NA	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Environmental sciences	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.6
Life sciences	1.9	3.0	4.0	4.7	5.2	5.1	5.2	5.6	6.8	6.4	8.2	9.2	10.8
Psychology	0.2	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.5	0.4	1.1	1.3
Social sciences	0.1	0.2	0.3	0.3	0.3	0.6	0.3	0.1	0.4	0.3	0.2	0.4	0.7
Engineering	0.2	0.3	0.4	0.3	0.2	0.3	0.2	0.5	0.6	0.5	1.0	1.2	1.7
Part-time positions													
Total science & engineering	2.9	3.2	3.4	4.5	4.0	6.0	6.5	5.7	6.2	7.4	5.9	5.5	8.9
Total sciences	2.8	3.1	3.2	4.3	3.9	5.7	6.2	5.4	5.6	6.9	5.4	5.1	8.6
Physical sciences	0.6	0.6	0.6	0.7	0.6	1.0	0.9	0.6	0.5	0.9	0.7	0.7	1.0
Mathematics	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.7
Computer sciences	NA	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Environmental sciences	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2
Life sciences	0.9	0.9	1.0	1.2	1.2	1.7	1.7	1.6	1.9	2.3	1.6	1.2	2.9
Psychology	0.4	0.5	0.6	1.0	0.8	1.0	1.0	1.0	1.0	1.2	1.2	1.1	1.1
Social sciences	0.7	0.8	0.8	1.0	1.0	1.6	2.2	1.8	1.7	2.0	1.3	1.3	2.6
Engineering	0.1	0.1	0.1	0.3	0.2	0.4	0.3	0.3	0.5	0.5	0.5	0.4	0.3

NA = not available

NOTES: Details may not add to totals because of rounding. Data exclude scientists and engineers with doctorates from foreign institutions. Field is field of degree. Faculty is defined by position. Senior faculty includes full and associate professors; junior faculty members are either assistant professors or instructors.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Characteristics of Doctoral Scientists and Engineers in the United States: 1997,* in press (Arlington, VA: 1999).

See figure 6-12 in Volume 1.

Appendix table 6-20.
Academic doctoral scientists and engineers by type of institution, appointment, and primary work responsibility: 1973–97
(Thousands)

Year	All academic institutions				Research universities[a]				All other institutions			
	Total	Teaching	Research	Other	Total	Teaching	Research	Other	Total	Teaching	Research	Other
Total employment												
1973	118.0	73.3	27.8	15.4	65.2	32.3	22.9	9.2	52.8	41.0	4.9	6.2
1975	134.1	83.8	30.8	16.4	73.4	36.6	25.6	9.7	60.7	47.2	5.2	6.7
1977	145.4	82.2	37.0	23.8	78.2	33.4	29.5	14.2	67.2	48.8	7.5	9.6
1979	155.3	83.8	41.3	29.1	83.5	34.0	32.2	16.8	71.8	49.8	9.1	12.3
1981	167.1	95.9	46.5	23.0	91.1	39.2	37.5	13.3	76.0	56.7	9.0	9.7
1983	176.1	97.7	48.9	28.1	89.9	36.8	37.4	14.8	86.2	60.9	11.5	13.3
1985	190.2	101.0	55.9	30.6	102.8	38.4	45.4	17.2	87.4	62.6	10.5	13.4
1987	195.9	99.3	66.5	29.5	106.9	36.0	53.8	16.9	89.0	63.3	12.7	12.6
1989	206.6	100.9	72.2	32.6	112.5	35.8	58.0	18.2	94.1	65.1	14.2	14.4
1991	210.6	103.4	73.9	32.3	111.6	34.5	57.9	18.8	99.0	68.9	16.0	13.5
1993	213.8	98.3	80.2	35.2	113.0	32.8	60.6	19.5	100.8	65.5	19.6	15.7
1995	217.5	100.2	83.0	34.3	112.7	31.7	62.3	18.7	104.8	68.5	20.7	15.6
1997	232.5	105.4	88.6	38.5	113.6	33.4	60.7	19.6	118.9	72.0	27.9	18.9
Full-time faculty												
1973	100.7	67.9	19.6	13.2	55.7	31.1	16.3	8.3	45.0	36.8	3.3	4.9
1975	113.5	77.7	21.2	14.5	61.5	35.1	17.5	8.9	52.0	42.6	3.7	5.6
1977	121.1	75.0	25.5	20.6	64.7	32.1	20.0	12.6	56.4	42.9	5.5	8.0
1979	123.5	74.3	27.1	22.0	67.0	32.5	21.1	13.5	56.5	41.8	6.0	8.5
1981	137.1	88.2	31.4	17.5	73.7	37.9	25.1	10.7	63.4	50.3	6.3	6.8
1983	137.2	84.3	31.9	20.9	72.3	34.9	25.3	12.1	64.9	49.4	6.6	8.8
1985	151.7	90.6	39.1	21.9	80.6	35.9	31.4	13.3	71.1	54.7	7.7	8.6
1987	159.9	89.9	48.3	21.7	84.2	33.6	38.4	12.2	75.7	56.3	9.9	9.5
1989	165.4	90.3	51.4	23.7	86.6	32.9	40.7	12.9	78.8	57.4	10.7	10.8
1991	168.1	92.4	53.5	22.2	85.8	32.1	41.1	12.5	82.3	60.3	12.4	9.7
1993	168.5	87.8	56.9	23.8	85.3	30.7	42.0	12.6	83.2	57.1	14.9	11.2
1995	165.5	87.3	55.9	22.3	81.8	29.1	41.1	11.6	83.7	58.2	14.8	10.7
1997	165.8	88.6	54.5	22.7	81.5	29.9	39.5	12.1	84.3	58.7	15.0	10.6
Postdoctorates												
1973	4.2	0.1	3.8	0.2	3.5	0.1	3.2	0.2	0.7	0.0	0.6	0.1
1975	6.2	0.1	5.7	0.4	5.3	0.1	4.9	0.3	0.9	0.1	0.8	0.1
1977	7.6	0.1	6.8	0.7	6.5	0.1	5.9	0.6	1.1	0.0	0.9	0.1
1979	8.1	0.2	6.9	1.0	6.8	0.1	5.8	0.9	1.3	0.1	1.1	0.1
1981	8.5	0.1	7.7	0.7	7.0	0.0	6.5	0.5	1.5	0.1	1.2	0.2
1983	8.3	0.4	7.1	0.7	6.7	0.2	6.1	0.4	1.6	0.3	1.1	0.3
1985	8.7	0.2	7.5	0.9	7.4	0.2	6.5	0.7	1.3	0.0	1.1	0.2
1987	9.3	0.2	8.4	0.7	8.1	0.2	7.3	0.6	1.2	0.0	1.0	0.2
1989	11.5	0.4	10.3	0.8	9.7	0.2	8.9	0.6	1.8	0.2	1.4	0.2
1991	9.9	0.1	9.2	0.6	8.3	0.1	7.8	0.4	1.5	0.1	1.3	0.1
1993	13.3	0.0	12.7	0.7	11.3	0.0	10.8	0.6	2.0	0.0	1.9	0.1
1995	16.8	0.6	15.1	1.1	13.6	0.3	12.4	0.9	3.2	0.3	2.7	0.2
1997	18.9	0.6	16.7	1.5	13.9	0.4	12.3	1.2	5.0	0.2	4.4	0.4
All other types of positions												
1973	13.1	5.3	4.4	2.0	6.0	1.1	3.4	0.7	7.1	4.2	1.0	1.2
1975	14.4	6.0	3.9	1.5	6.6	1.4	3.2	0.5	7.8	4.5	0.7	1.0
1977	16.7	7.1	4.7	2.5	7.0	1.2	3.6	1.0	9.7	5.9	1.1	1.5
1979	23.7	9.3	7.3	6.1	9.7	1.4	5.3	2.4	14.0	7.9	2.0	3.7
1981	21.5	7.6	7.4	4.8	10.4	1.3	5.9	2.1	11.1	6.3	1.5	2.7
1983	30.6	13.0	9.9	6.5	10.9	1.7	6.0	2.3	19.7	11.2	3.9	4.2
1985	29.8	10.2	9.3	7.8	14.8	2.3	7.6	3.2	15.0	7.9	1.7	4.6
1987	26.7	9.2	9.8	7.1	14.6	2.2	8.1	4.1	12.1	7.0	1.8	2.9
1989	29.7	10.2	10.5	8.1	16.2	2.7	8.4	4.7	13.5	7.5	2.1	3.4
1991	32.6	10.9	11.2	9.5	17.5	2.3	9.0	5.9	15.2	8.5	2.3	3.7
1993	32.0	10.5	10.6	10.7	16.4	2.1	7.8	6.3	15.6	8.4	2.8	4.4
1995	35.2	12.3	12.0	10.9	17.3	2.3	8.8	6.2	17.9	10.0	3.2	4.7
1997	47.8	16.2	17.4	14.3	18.2	3.1	8.9	6.3	29.6	13.1	8.5	7.9

NOTE: Details may not add to totals because of rounding and omission of respondents with unreported work responsibility.

[a]Institutions are designated by Carnegie classification code (see Carnegie Foundation for the Advancement of Teaching, *A Classification of Institutions of Higher Education*, 1994 ed., Princeton: Princeton University Press, 1994).

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Doctorate Recipients, special tabulations.

See pages 6-21 and 6-22 in Volume 1.

Appendix table 6-21.
Recent S&E Ph.D.s in academia by type of institution, appointment, and primary work responsibility: 1973–97
(Thousands)

Year	All academic institutions				Research universities[a]				All other institutions			
	Total	Teaching	Research	Other	Total	Teaching	Research	Other	Total	Teaching	Research	Other
Total employment												
1973	25.0	15.1	7.8	2.1	12.6	5.0	6.3	1.2	12.4	10.1	1.5	0.9
1975	23.4	13.5	8.0	1.9	12.6	4.6	6.7	1.2	10.8	8.8	1.2	0.7
1977	22.5	11.7	8.5	2.3	12.3	4.0	6.9	1.4	10.2	7.7	1.5	1.0
1979	20.9	9.1	9.0	2.8	12.3	3.4	7.2	1.8	8.6	5.8	1.8	1.0
1981	20.7	9.3	9.3	2.1	12.9	3.9	7.8	1.2	7.8	5.3	1.5	0.9
1983	20.5	8.6	9.5	2.4	12.1	2.8	8.0	1.2	8.4	5.8	1.5	1.2
1985	21.8	8.6	10.4	2.8	13.7	3.3	8.8	1.6	8.1	5.4	1.6	1.2
1987	21.1	7.5	11.2	2.3	13.6	2.7	9.5	1.4	7.5	4.9	1.7	0.9
1989	23.3	7.5	13.5	2.3	15.0	2.6	11.0	1.3	8.3	4.9	2.5	1.0
1991	25.5	9.4	13.4	2.6	15.3	2.8	10.8	1.8	10.2	6.6	2.7	0.9
1993	25.1	8.4	14.0	2.7	15.4	2.2	11.3	1.8	9.8	6.2	2.7	0.9
1995	26.9	8.8	14.8	3.3	16.1	2.3	11.6	2.2	10.8	6.5	3.2	1.1
1997	29.0	10.1	15.4	3.5	16.1	3.0	11.1	2.0	12.9	7.2	4.2	1.5
Full-time faculty												
1973	18.4	14.2	2.9	1.3	7.6	4.7	2.2	0.6	10.8	9.5	0.7	0.6
1975	16.4	12.5	2.7	1.2	7.1	4.2	2.2	0.7	9.3	8.3	0.5	0.5
1977	14.6	10.7	2.7	1.2	6.2	3.6	2.0	0.6	8.4	7.1	0.7	0.6
1979	12.4	8.3	2.8	1.2	5.9	3.1	2.0	0.7	6.5	5.2	0.8	0.5
1981	11.8	8.7	2.2	0.8	5.9	3.7	1.7	0.5	5.9	5.0	0.5	0.4
1983	11.6	7.8	2.6	1.2	5.2	2.6	2.1	0.5	6.3	5.2	0.4	0.7
1985	11.9	7.6	3.2	1.2	6.0	2.8	2.6	0.6	6.0	4.8	0.6	0.6
1987	10.9	6.5	3.5	0.9	5.5	2.1	2.9	0.5	5.5	4.4	0.6	0.4
1989	11.1	6.2	4.2	0.7	5.5	2.0	3.2	0.3	5.6	4.2	0.9	0.5
1991	14.0	8.3	4.7	1.0	6.4	2.4	3.4	0.6	7.6	5.9	1.3	0.4
1993	12.0	7.1	4.2	0.7	5.1	1.8	3.1	0.3	6.8	5.4	1.1	0.4
1995	11.1	7.1	3.1	1.0	4.3	1.8	2.1	0.4	6.8	5.3	1.0	0.5
1997	11.8	8.0	2.7	1.0	4.3	2.1	1.8	0.4	7.5	5.9	0.9	0.6
Other types of appointments												
1973	6.6	0.9	4.9	0.8	5.0	0.3	4.1	0.6	1.6	0.5	0.8	0.3
1975	6.9	1.0	5.2	0.7	5.4	0.4	4.5	0.5	1.5	0.5	0.7	0.2
1977	7.9	1.0	5.8	1.1	6.1	0.4	4.9	0.8	1.8	0.6	0.9	0.4
1979	8.5	0.8	6.2	1.5	6.4	0.2	5.2	1.0	2.1	0.5	1.1	0.5
1981	8.9	0.5	7.1	1.3	7.0	0.2	6.1	0.7	1.9	0.3	1.0	0.6
1983	8.9	0.8	7.0	1.2	6.8	0.3	5.9	0.7	2.1	0.5	1.1	0.5
1985	9.9	1.1	7.2	1.6	7.7	0.5	6.2	1.1	2.1	0.6	1.0	0.5
1987	10.2	1.0	7.7	1.4	8.2	0.6	6.7	0.9	2.0	0.5	1.0	0.5
1989	12.2	1.3	9.3	1.6	9.6	0.7	7.8	1.1	2.7	0.6	1.5	0.6
1991	11.4	1.0	8.8	1.6	8.9	0.3	7.4	1.2	2.5	0.7	1.4	0.4
1993	13.2	1.3	9.9	2.0	10.2	0.5	8.2	1.5	2.9	0.8	1.6	0.5
1995	15.8	1.7	11.7	2.4	11.8	0.5	9.5	1.8	4.0	1.2	2.2	0.6
1997	17.2	2.1	12.6	2.5	11.8	0.8	9.3	1.6	5.4	1.2	3.3	0.9

NOTES: Recent Ph.D.s are here defined as having earned their doctorate within the three years preceding the survey year. Other types of positions include postdoctorates, research associates, adjunct appointments, lecturers, administrative positions, and part-time appointments of all kinds. Details may not add to totals because of rounding and omission of respondents with unreported work responsibility.

[a]Institutions are designated by Carnegie classification code. (See Carnegie Foundation for the Advancement of Teaching, *A Classification of Institutions of Higher Education*, 1994 ed., Princeton: Princeton University Press, 1994).

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Doctorate Recipients, special tabulations.

See figure 6-13 in Volume 1.

Appendix table 6-22.
Academic employment of doctoral scientists and engineers, by degree field, sex, and type of position: 1973–97
(Thousands)

Field and sex	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
Total academic employment													
All, total S&E	118.0	134.1	145.5	155.4	167.1	176.2	190.3	196.0	206.7	210.6	213.8	217.5	232.5
Total sciences	105.6	120.7	130.7	139.5	151.0	158.1	170.4	174.8	183.9	187.8	190.6	193.7	205.9
Physical sciences	22.1	23.6	25.0	24.6	25.4	25.1	27.0	27.2	27.7	27.7	28.6	29.3	30.2
Mathematics	9.7	11.0	11.7	12.2	12.4	12.9	13.6	13.8	14.5	15.2	15.5	14.6	15.6
Computer sciences	NA	NA	NA	0.1	0.3	0.5	0.8	1.1	1.5	2.0	2.5	3.1	3.3
Environmental sciences	3.4	3.9	4.2	4.2	4.6	4.8	5.2	5.6	5.9	6.0	6.4	6.4	7.3
Life sciences	34.9	39.4	42.6	47.0	51.3	54.9	58.7	61.3	64.8	66.9	68.2	71.6	77.3
Psychology	12.2	14.8	16.2	17.7	20.1	21.0	23.1	23.7	25.0	25.2	25.0	26.1	27.3
Social sciences	23.4	28.0	31.1	33.6	36.9	38.9	42.0	42.2	44.5	44.8	44.4	42.5	44.9
Engineering	12.4	13.4	14.8	15.8	16.1	18.1	19.9	21.2	22.9	22.8	23.1	23.8	26.6
Male, total S&E	107.3	120.3	129.0	136.0	144.0	149.8	159.2	162.0	168.0	168.7	166.9	165.1	173.3
Total sciences	94.9	106.9	114.3	120.3	128.1	132.0	139.7	141.4	145.8	146.9	144.8	142.9	148.4
Physical sciences	20.7	22.1	23.3	22.9	23.5	23.2	24.9	24.9	25.2	25.4	25.7	25.9	26.2
Mathematics	9.0	10.3	10.8	11.3	11.3	11.8	12.3	12.5	13.0	13.9	13.7	12.8	13.5
Computer sciences	NA	NA	NA	0.1	0.3	0.4	0.7	0.9	1.3	1.6	2.1	2.5	2.6
Environmental sciences	3.3	3.8	4.1	4.0	4.3	4.5	4.9	5.1	5.3	5.4	5.7	5.5	6.2
Life sciences	30.8	34.3	36.6	40.1	42.9	44.5	46.7	47.9	49.5	50.1	49.4	50.1	52.6
Psychology	10.0	11.8	12.6	13.5	14.9	15.1	16.0	16.2	16.5	16.0	14.7	14.7	15.4
Social sciences	21.0	24.7	26.9	28.5	30.9	32.3	34.3	33.9	35.1	34.6	33.4	31.3	31.9
Engineering	12.3	13.3	14.7	15.7	15.9	17.8	19.5	20.6	22.2	21.8	22.1	22.3	24.8
Female, total S&E	10.7	13.8	16.5	19.4	23.1	26.5	31.1	34.0	38.7	41.9	46.9	52.4	59.2
Total sciences	10.7	13.8	16.4	19.2	22.9	26.1	30.7	33.5	38.0	40.9	45.8	50.9	57.5
Physical sciences	1.4	1.5	1.6	1.7	1.9	1.9	2.1	2.3	2.5	2.3	2.9	3.5	4.0
Mathematics	0.6	0.8	0.9	0.9	1.1	1.1	1.3	1.4	1.5	1.4	1.7	1.8	2.1
Computer sciences	NA	NA	NA	0.0	0.0	0.1	0.1	0.1	0.2	0.4	0.5	0.6	0.7
Environmental sciences	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.9	1.1
Life sciences	4.0	5.1	6.0	6.9	8.4	10.3	12.1	13.3	15.3	16.8	18.8	21.5	24.7
Psychology	2.2	3.0	3.6	4.3	5.2	5.9	7.1	7.6	8.5	9.2	10.3	11.5	11.9
Social sciences	2.4	3.3	4.2	5.2	6.0	6.5	7.7	8.3	9.4	10.2	10.9	11.2	13.0
Engineering	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.6	0.7	1.0	1.1	1.5	1.7
Full-time senior faculty													
All, total S&E	74.0	84.3	90.7	97.2	107.3	115.6	119.7	127.3	131.0	133.0	128.6	127.3	131.9
Total sciences	65.3	74.5	80.0	85.6	94.9	101.8	105.8	112.0	115.2	117.2	113.0	112.1	115.4
Physical sciences	13.0	14.6	15.3	16.0	16.8	17.1	17.7	18.3	17.8	17.6	16.9	16.4	16.7
Mathematics	5.9	6.9	7.6	8.3	9.1	9.7	10.0	10.5	10.9	11.8	11.5	10.6	10.8
Computer sciences	NA	NA	NA	0.0	0.0	0.1	0.1	0.3	0.4	0.9	0.9	1.7	1.7
Environmental sciences	2.2	2.5	2.7	2.8	2.9	3.1	3.1	3.2	3.6	3.6	3.7	3.6	3.8
Life sciences	21.0	23.4	24.6	27.0	29.6	32.6	33.7	35.8	36.4	37.4	35.8	37.2	38.3
Psychology	7.3	8.7	9.1	9.9	11.7	12.8	13.5	14.3	15.0	15.3	14.3	14.5	15.3
Social sciences	15.9	18.5	20.7	21.7	24.9	26.3	27.7	29.5	31.1	30.6	29.9	28.1	28.8
Engineering	8.7	9.7	10.7	11.6	12.4	13.7	13.9	15.3	15.9	15.8	15.7	15.3	16.6

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-22.
Academic employment of doctoral scientists and engineers, by degree field, sex, and type of position: 1973–97
(Thousands)

Field and sex	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
Male, total S&E	69.7	78.9	84.7	90.2	98.7	104.9	107.4	113.2	115.2	115.5	110.3	107.0	109.4
Total sciences	61.0	69.2	74.0	78.7	86.4	91.3	93.7	98.2	99.6	100.1	95.0	92.2	93.3
Physical sciences	12.5	14.1	14.7	15.4	16.2	16.4	17.0	17.5	16.9	16.9	16.0	15.4	15.6
Mathematics	5.6	6.5	7.2	7.9	8.6	9.1	9.3	9.8	10.0	10.8	10.5	9.8	10.0
Computer sciences	NA	NA	NA	0.0	0.0	0.1	0.1	0.3	0.4	0.8	0.8	1.4	1.3
Environmental sciences	2.2	2.5	2.7	2.7	2.8	3.0	3.0	3.1	3.4	3.4	3.5	3.4	3.3
Life sciences	19.5	21.6	22.7	24.8	26.9	29.1	29.4	31.0	31.0	31.4	29.3	29.3	30.0
Psychology	6.4	7.6	7.8	8.4	9.7	10.5	10.8	11.2	11.5	11.3	10.2	10.1	10.7
Social sciences	14.7	16.9	18.8	19.5	22.3	23.2	24.1	25.3	26.4	25.5	24.7	22.8	22.4
Engineering	8.7	9.7	10.7	11.5	12.2	13.6	13.7	15.1	15.7	15.4	15.3	14.8	16.1
Female, total S&E	4.3	5.4	6.0	7.0	8.6	10.7	12.4	14.0	15.8	17.6	18.3	20.3	22.5
Total sciences	4.3	5.4	6.0	6.9	8.5	10.5	12.2	13.8	15.6	17.1	18.0	19.8	22.0
Physical sciences	0.5	0.5	0.6	0.6	0.6	0.7	0.8	0.9	0.9	0.7	0.9	1.0	1.1
Mathematics	0.3	0.4	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.0	0.8	0.8
Computer sciences	NA	NA	NA	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.3
Environmental sciences	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.4
Life sciences	1.5	1.8	1.9	2.2	2.7	3.5	4.3	4.8	5.4	6.1	6.5	7.8	8.3
Psychology	0.8	1.1	1.2	1.4	2.0	2.4	2.7	3.1	3.5	4.0	4.1	4.4	4.6
Social sciences	1.1	1.5	1.8	2.2	2.6	3.1	3.6	4.1	4.7	5.1	5.2	5.3	6.4
Engineering	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.3	0.5	0.5
Full-time junior faculty													
All, total S&E	29.3	32.1	34.9	34.0	34.6	32.8	37.2	37.2	38.7	40.1	43.8	44.0	46.4
Total sciences	26.7	29.6	32.2	31.3	32.3	30.2	33.1	33.2	34.4	35.8	39.3	39.3	41.5
Physical sciences	4.8	4.3	4.8	4.0	3.7	3.1	3.5	3.6	3.7	4.1	4.3	4.5	4.8
Mathematics	3.3	3.5	3.3	3.1	2.6	2.5	2.7	2.4	2.6	2.4	3.2	2.4	2.8
Computer sciences	NA	NA	NA	0.1	0.2	0.3	0.6	0.6	0.9	1.0	1.4	1.2	1.3
Environmental sciences	0.8	0.9	0.9	0.7	0.9	0.9	1.1	1.1	1.1	0.9	0.9	1.1	1.3
Life sciences	8.5	9.7	10.3	10.3	11.3	10.8	11.9	12.3	12.8	13.7	15.0	15.6	16.9
Psychology	3.6	4.2	4.8	4.4	4.8	4.5	5.0	4.9	5.2	5.4	5.2	5.5	5.5
Social sciences	5.7	7.1	8.2	8.6	8.8	8.1	8.4	8.2	7.9	8.4	9.3	9.0	8.9
Engineering	2.6	2.5	2.7	2.8	2.3	2.7	4.0	4.0	4.3	4.3	4.5	4.8	5.0
Male, total S&E	26.0	27.5	28.9	27.3	27.1	25.2	27.8	27.2	27.6	28.1	29.7	28.5	29.5
Total sciences	23.5	25.1	26.3	24.6	24.9	22.6	23.9	23.4	23.5	24.2	25.7	24.4	25.1
Physical sciences	4.5	4.0	4.4	3.6	3.2	2.7	3.0	3.2	3.2	3.4	3.5	3.4	3.5
Mathematics	3.1	3.2	2.9	2.7	2.2	2.2	2.3	2.0	2.2	2.2	2.7	2.0	2.2
Computer sciences	NA	NA	NA	0.1	0.2	0.3	0.5	0.5	0.8	0.8	1.1	1.0	1.0
Environmental sciences	0.7	0.9	0.8	0.7	0.9	0.8	0.9	0.9	0.9	0.7	0.7	0.7	1.0
Life sciences	7.5	8.1	8.4	8.1	8.9	8.1	8.5	8.5	8.4	8.8	9.5	9.5	9.8
Psychology	2.7	3.0	3.3	2.8	3.0	2.6	2.7	2.7	2.9	3.0	2.3	2.4	2.1
Social sciences	5.0	5.9	6.5	6.6	6.5	5.9	6.0	5.6	5.2	5.3	5.9	5.5	5.5
Engineering	2.6	2.4	2.7	2.7	2.2	2.6	3.8	3.8	4.0	3.9	4.0	4.1	4.4

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-22.
Academic employment of doctoral scientists and engineers, by degree field, sex, and type of position: 1973–97
(Thousands)

Field and sex	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
Female, total S&E	3.3	4.6	6.0	6.8	7.5	7.7	9.4	10.0	11.2	12.0	14.1	15.6	17.0
Total sciences	3.3	4.6	5.9	6.7	7.4	7.6	9.2	9.7	10.8	11.6	13.6	14.9	16.4
Physical sciences	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.7	0.9	1.1	1.3
Mathematics	0.2	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.5	0.5	0.6
Computer sciences	NA	NA	NA	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.2	0.3
Environmental sciences	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.3
Life sciences	1.1	1.6	1.9	2.2	2.4	2.7	3.4	3.8	4.5	4.9	5.5	6.1	7.1
Psychology	0.9	1.2	1.5	1.6	1.8	1.9	2.3	2.2	2.3	2.4	2.9	3.1	3.4
Social sciences	0.8	1.2	1.7	2.1	2.3	2.1	2.4	2.6	2.7	3.0	3.4	3.5	3.5
Engineering	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.7	0.6
All other full-time positions													
All, total S&E	7.6	8.3	8.8	11.4	12.6	13.4	18.1	16.4	19.2	20.2	22.2	23.8	26.4
Total sciences	6.7	7.4	8.0	10.5	11.5	12.4	16.6	15.3	17.7	18.4	20.8	21.6	23.3
Physical sciences	1.9	1.9	2.1	2.0	2.4	2.5	3.0	2.6	3.3	3.2	3.7	3.8	4.6
Mathematics	0.2	0.3	0.4	0.4	0.4	0.3	0.5	0.4	0.5	0.7	0.5	0.6	0.8
Computer sciences	NA	NA	NA	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
Environmental sciences	0.3	0.3	0.3	0.5	0.5	0.5	0.7	0.8	0.7	0.9	1.1	1.1	1.4
Life sciences	2.5	2.4	2.8	3.9	4.0	4.6	6.2	6.0	6.7	7.2	7.7	8.4	8.4
Psychology	0.8	1.0	1.2	1.8	2.2	2.2	2.9	2.8	2.9	2.8	3.9	3.9	4.0
Social sciences	1.0	1.5	1.2	1.9	2.0	2.2	3.2	2.6	3.5	3.5	3.7	3.6	3.9
Engineering	0.8	0.9	0.8	0.9	1.1	1.1	1.5	1.1	1.5	1.8	1.5	2.1	3.1
Male, total S&E	6.5	7.2	7.4	9.4	10.0	10.3	14.3	12.0	13.9	14.4	15.4	16.1	18.0
Total sciences	5.8	6.4	6.6	8.6	8.9	9.3	12.8	10.9	12.5	12.8	13.9	14.2	15.3
Physical sciences	1.8	1.8	1.9	1.8	2.1	2.2	2.7	2.2	2.9	2.9	3.3	3.2	4.0
Mathematics	0.2	0.3	0.4	0.3	0.3	0.2	0.4	0.4	0.4	0.6	0.4	0.5	0.7
Computer sciences	NA	NA	NA	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1
Environmental sciences	0.3	0.3	0.3	0.5	0.5	0.5	0.7	0.7	0.6	0.7	0.9	0.9	1.2
Life sciences	2.0	1.9	2.2	3.0	3.0	3.2	4.6	4.1	4.6	4.9	5.1	5.6	5.3
Psychology	0.7	0.8	0.9	1.4	1.4	1.4	1.8	1.6	1.5	1.2	1.9	1.7	1.8
Social sciences	0.8	1.3	0.9	1.6	1.6	1.7	2.5	1.8	2.4	2.4	2.2	2.1	2.2
Engineering	0.8	0.9	0.8	0.9	1.1	1.0	1.5	1.0	1.4	1.7	1.5	2.0	2.7
Female, total S&E	1.1	1.0	1.4	2.0	2.6	3.1	3.8	4.5	5.3	5.8	6.7	7.7	8.4
Total sciences	1.1	1.0	1.4	1.9	2.6	3.0	3.8	4.5	5.2	5.6	6.7	7.5	8.2
Physical sciences	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.6	0.7
Mathematics	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2
Computer sciences	NA	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Environmental sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2
Life sciences	0.6	0.5	0.6	0.9	1.0	1.3	1.6	1.8	2.1	2.4	2.6	2.8	3.1
Psychology	0.2	0.2	0.3	0.5	0.8	0.8	1.1	1.3	1.4	1.6	2.0	2.2	2.2
Social sciences	0.2	0.2	0.2	0.3	0.4	0.5	0.7	0.8	1.1	1.1	1.5	1.5	1.7
Engineering	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-22.
Academic employment of doctoral scientists and engineers, by degree field, sex, and type of position: 1973–97
(Thousands)

Field and sex	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
Postdoctoral positions													
All, total S&E	4.2	6.2	7.6	8.1	8.5	8.3	8.7	9.3	11.5	9.9	13.3	16.8	18.9
Total sciences	4.0	5.9	7.2	7.8	8.4	8.0	8.5	8.8	10.9	9.4	12.3	15.6	17.2
Physical sciences	1.7	2.1	2.2	1.9	1.9	1.4	1.9	2.0	2.4	1.9	3.0	3.9	3.2
Mathematics	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.0	0.5	0.5
Computer sciences	NA	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Environmental sciences	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.6
Life sciences	1.9	3.0	4.0	4.7	5.2	5.1	5.2	5.6	6.8	6.4	8.2	9.2	10.8
Psychology	0.2	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.5	0.4	1.1	1.3
Social sciences	0.1	0.2	0.3	0.3	0.3	0.6	0.3	0.1	0.4	0.3	0.2	0.4	0.7
Engineering	0.2	0.3	0.4	0.3	0.2	0.3	0.2	0.5	0.6	0.5	1.0	1.2	1.7
Male, total S&E	3.5	4.9	6.1	6.3	6.3	5.8	6.0	6.8	8.2	6.8	9.2	11.1	12.1
Total sciences	3.4	4.7	5.7	6.0	6.1	5.5	5.9	6.3	7.6	6.4	8.3	10.1	10.6
Physical sciences	1.5	1.9	1.9	1.7	1.6	1.2	1.6	1.7	2.0	1.5	2.5	3.3	2.5
Mathematics	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.0	0.0	0.3	0.3
Computer sciences	NA	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Environmental sciences	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.3	0.4	0.4	0.5
Life sciences	1.5	2.2	2.9	3.5	3.6	3.3	3.4	3.8	4.7	4.1	5.2	5.5	6.2
Psychology	0.1	0.2	0.4	0.4	0.5	0.3	0.4	0.3	0.3	0.2	0.1	0.4	0.5
Social sciences	0.1	0.1	0.2	0.2	0.1	0.4	0.2	0.1	0.2	0.2	0.1	0.2	0.5
Engineering	0.2	0.3	0.4	0.3	0.2	0.3	0.2	0.5	0.5	0.4	0.9	1.0	1.4
Female, total S&E	0.6	1.3	1.6	1.8	2.2	2.5	2.6	2.6	3.3	3.0	4.1	5.7	6.8
Total sciences	0.6	1.3	1.6	1.8	2.2	2.5	2.6	2.6	3.3	3.0	4.0	5.5	6.6
Physical sciences	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.6	0.6	0.6
Mathematics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
Computer sciences	NA	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Life sciences	0.4	0.8	1.1	1.2	1.6	1.8	1.8	1.8	2.2	2.3	3.0	3.7	4.6
Psychology	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.5	0.3	0.3	0.7	0.8
Social sciences	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Engineering	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2
Part-time positions													
All, total S&E	2.9	3.2	3.4	4.5	4.0	6.0	6.5	5.7	6.2	7.4	5.9	5.5	8.9
Total sciences	2.8	3.1	3.2	4.3	3.9	5.7	6.2	5.4	5.6	6.9	5.4	5.1	8.6
Physical sciences	0.6	0.6	0.6	0.7	0.6	1.0	0.9	0.6	0.5	0.9	0.7	0.7	1.0
Mathematics	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.7
Computer sciences	NA	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Environmental sciences	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2
Life sciences	0.9	0.9	1.0	1.2	1.2	1.7	1.7	1.6	1.9	2.3	1.6	1.2	2.9
Psychology	0.4	0.5	0.6	1.0	0.8	1.0	1.0	1.0	1.0	1.2	1.2	1.1	1.1
Social sciences	0.7	0.8	0.8	1.0	1.0	1.6	2.2	1.8	1.7	2.0	1.3	1.3	2.6
Engineering	0.1	0.1	0.1	0.3	0.2	0.4	0.3	0.3	0.5	0.5	0.5	0.4	0.3

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-22.
Academic employment of doctoral scientists and engineers, by degree field, sex, and type of position: 1973–97
(Thousands)

Field and sex	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
Male, total S&E	1.5	1.8	1.8	2.7	1.9	3.5	3.6	2.7	3.1	3.8	2.3	2.4	4.4
Total sciences	1.4	1.7	1.6	2.4	1.7	3.2	3.3	2.5	2.6	3.4	1.9	2.0	4.1
Physical sciences	0.4	0.3	0.4	0.5	0.3	0.8	0.6	0.4	0.3	0.6	0.5	0.5	0.7
Mathematics	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.3
Computer sciences	NA	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental sciences	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1
Life sciences	0.4	0.5	0.4	0.5	0.4	0.7	0.7	0.5	0.8	1.0	0.4	0.3	1.3
Psychology	0.1	0.2	0.2	0.5	0.3	0.4	0.4	0.4	0.3	0.2	0.1	0.1	0.3
Social sciences	0.4	0.5	0.4	0.6	0.5	1.1	1.4	1.0	0.8	1.2	0.5	0.7	1.4
Engineering	0.1	0.1	0.1	0.3	0.2	0.3	0.3	0.3	0.5	0.5	0.4	0.3	0.2
Female, total S&E	1.4	1.5	1.6	1.9	2.1	2.5	2.9	3.0	3.1	3.5	3.6	3.1	4.5
Total sciences	1.4	1.5	1.6	1.9	2.1	2.5	2.9	2.9	3.1	3.5	3.5	3.1	4.4
Physical sciences	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.3
Mathematics	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4
Computer sciences	NA	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental sciences	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Life sciences	0.5	0.5	0.6	0.6	0.7	0.9	1.0	1.1	1.1	1.3	1.2	0.9	1.6
Psychology	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.9	1.1	1.0	0.8
Social sciences	0.3	0.3	0.3	0.4	0.5	0.5	0.9	0.8	0.8	0.8	0.8	0.7	1.2
Engineering	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

NA = not available

NOTES: Data exclude scientists and engineers with doctorates from foreign institutions. Field is field of degree. Faculty defined by position. Senior faculty includes full and associate professors; junior faculty members are either assistant professors or instructors. Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Characteristics of Doctoral Scientists and Engineers in the United States: 1997*, Detailed Statistical Tables, in press (Arlington, VA: 1999).

See figure 6-14 in Volume 1.

Appendix table 6-23.
Academic employment of doctoral scientists and engineers, by degree field, race/ethnicity, and type of position: 1973–97
(Thousands)

Field and race/ethnicity	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
						Total academic employment							
All, total S&E	118.0	134.1	145.4	155.3	167.1	176.1	190.2	195.9	206.6	210.6	213.8	217.5	232.5
Total sciences	105.6	120.6	130.7	139.5	150.9	157.9	170.3	174.7	183.8	187.8	190.6	193.7	205.9
Physical sciences	22.1	23.6	25.0	24.6	25.3	25.1	27.0	27.2	27.7	27.7	28.6	29.4	30.2
Mathematics	9.7	11.0	11.7	12.2	12.4	12.9	13.6	13.8	14.5	15.2	15.5	14.6	15.6
Computer sciences	0.0	0.0	0.0	0.1	0.3	0.5	0.8	1.1	1.5	2.0	2.5	3.1	3.3
Environmental sciences	3.4	3.9	4.2	4.2	4.6	4.8	5.2	5.6	5.9	6.1	6.4	6.4	7.3
Life sciences	34.9	39.4	42.6	47.0	51.3	54.8	58.7	61.2	64.8	66.9	68.2	71.6	77.3
Psychology	12.2	14.8	16.2	17.7	20.1	21.0	23.1	23.7	25.0	25.2	25.0	26.1	27.3
Social sciences	23.4	28.0	31.1	33.6	36.9	38.8	41.9	42.1	44.5	44.8	44.4	42.5	44.9
Engineering	12.4	13.4	14.8	15.8	16.1	18.1	19.9	21.2	22.8	22.8	23.1	23.8	26.6
White non-Hispanic, total S&E	107.7	121.6	131.4	140.0	149.9	157.2	168.4	172.8	181.0	183.5	181.8	182.6	193.2
Total sciences	96.9	109.9	118.8	126.5	135.9	142.0	152.0	155.7	163.0	165.3	164.3	165.0	173.0
Physical sciences	19.7	21.1	22.1	21.9	22.3	21.9	23.4	23.3	23.7	23.8	23.4	23.8	24.4
Mathematics	8.8	10.0	10.6	10.8	11.0	11.5	11.9	12.2	12.6	13.0	12.9	12.0	12.6
Computer sciences	0.0	0.0	0.0	0.1	0.2	0.4	0.6	0.9	1.1	1.4	1.6	2.1	2.2
Environmental sciences	3.3	3.7	4.0	4.0	4.3	4.5	4.9	5.2	5.5	5.7	5.9	5.7	6.6
Life sciences	32.1	35.8	38.8	42.4	46.1	49.3	52.7	54.6	57.6	59.2	59.1	61.3	64.9
Psychology	11.6	13.9	15.2	16.8	18.8	19.6	21.3	22.0	23.2	23.2	22.9	23.6	24.4
Social sciences	21.4	25.3	28.2	30.5	33.1	34.7	37.2	37.5	39.4	39.1	38.6	36.5	38.0
Engineering	10.8	11.6	12.6	13.5	14.0	15.2	16.4	17.2	18.1	18.2	17.5	17.6	20.2
Asian/Pacific Islander, total S&E	5.0	6.1	6.7	9.8	10.8	11.8	14.0	15.0	16.3	16.8	20.9	22.4	25.4
Total sciences	4.0	5.0	5.4	7.8	9.1	9.4	11.1	11.5	12.2	13.1	16.2	17.5	20.3
Physical sciences	1.1	1.3	1.4	1.8	2.0	2.2	2.6	2.9	2.8	2.6	3.8	4.1	4.1
Mathematics	0.4	0.5	0.5	0.9	0.9	1.0	1.1	1.1	1.3	1.6	1.9	1.8	2.2
Computer sciences	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.5	0.7	0.9	0.9
Environmental sciences	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.3	0.2	0.4	0.5	0.5
Life sciences	1.3	1.8	2.0	3.1	3.6	3.6	4.0	4.4	4.7	5.1	6.3	6.8	8.5
Psychology	0.1	0.1	0.2	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.7
Social sciences	1.0	1.1	1.2	1.6	2.0	2.0	2.5	2.2	2.4	2.6	2.7	2.8	3.2
Engineering	1.1	1.1	1.3	1.9	1.8	2.4	3.0	3.5	4.1	3.7	4.7	4.9	5.2
Underrepresented minorities, total S&E	2.4	3.2	3.7	4.9	5.8	6.5	7.2	7.8	9.0	9.9	10.7	12.4	13.7
Total sciences	2.2	2.9	3.4	4.5	5.5	6.0	6.7	7.2	8.3	9.0	9.8	11.2	12.6
Physical sciences	0.5	0.5	0.5	0.7	0.9	0.9	0.9	1.0	1.1	1.2	1.4	1.4	1.7
Mathematics	0.2	0.2	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.5	0.7	0.8	0.7
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1
Environmental sciences	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Life sciences	0.8	1.1	1.2	1.3	1.5	1.7	1.8	2.1	2.4	2.6	2.7	3.5	3.9
Psychology	0.3	0.4	0.6	0.5	0.8	1.0	1.2	1.2	1.3	1.5	1.6	2.0	2.3
Social sciences	0.5	0.8	0.8	1.5	1.8	2.0	2.1	2.3	2.8	3.0	3.1	3.2	3.6
Engineering	0.2	0.2	0.3	0.4	0.3	0.5	0.5	0.5	0.7	0.9	0.9	1.2	1.2

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-23.
Academic employment of doctoral scientists and engineers, by degree field, race/ethnicity, and type of position: 1973–97
(Thousands)

Field and race/ethnicity	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
American Indian/Alaskan Native, total S&E	0.2	0.3	0.4	0.6	0.7	0.7	0.8	0.8	1.0	0.8	0.9	0.9	0.9
Total sciences	0.2	0.3	0.3	0.6	0.7	0.7	0.7	0.8	0.9	0.8	0.9	0.8	0.8
Physical sciences	0.0	0.1	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1
Mathematics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life sciences	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Psychology	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Social sciences	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.3	0.5	0.3	0.4	0.3	0.3
Engineering	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
Black non-Hispanic, total S&E	1.3	1.7	1.7	1.9	2.6	3.1	3.3	3.5	3.8	4.6	4.8	5.8	6.6
Total sciences	1.2	1.6	1.7	1.9	2.5	2.9	3.2	3.3	3.5	4.2	4.5	5.4	6.1
Physical sciences	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.5	0.5	0.7
Mathematics	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life sciences	0.4	0.6	0.6	0.6	0.6	0.8	0.9	0.9	1.0	1.2	1.3	1.7	1.9
Psychology	0.2	0.2	0.3	0.3	0.4	0.6	0.6	0.7	0.7	0.8	0.9	1.0	1.2
Social sciences	0.3	0.5	0.5	0.7	1.0	1.1	1.3	1.2	1.2	1.6	1.6	1.7	2.0
Engineering	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.4	0.3	0.5	0.5
Hispanic, total S&E	0.9	1.2	1.6	2.4	2.5	2.6	3.1	3.4	4.3	4.5	5.0	5.7	6.2
Total sciences	0.8	1.1	1.4	2.1	2.4	2.4	2.8	3.1	3.9	4.1	4.4	5.0	5.6
Physical sciences	0.2	0.2	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.8	0.8	0.8	0.9
Mathematics	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.4
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1
Environmental sciences	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Life sciences	0.4	0.4	0.5	0.7	0.8	0.8	0.8	1.0	1.2	1.2	1.3	1.6	1.8
Psychology	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.8	1.0
Social sciences	0.1	0.2	0.2	0.6	0.5	0.6	0.7	0.8	1.1	1.1	1.2	1.1	1.3
Engineering	0.1	0.1	0.2	0.3	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.7	0.6
Full-time faculty													
All, total S&E	103.3	116.4	125.6	131.2	141.9	148.4	156.9	164.4	169.8	173.1	172.4	171.4	178.4
Total sciences	92.0	104.2	112.2	116.9	127.2	132.0	139.0	145.1	149.5	153.1	152.2	151.3	156.8
Physical sciences	17.8	18.9	20.0	20.0	20.5	20.2	21.2	22.0	21.5	21.7	21.3	20.9	21.4
Mathematics	9.3	10.4	10.9	11.4	11.7	12.3	12.7	12.9	13.5	14.2	14.7	13.0	13.6
Computer sciences	0.0	0.0	0.0	0.1	0.3	0.4	0.7	0.9	1.3	1.8	2.3	2.8	3.0
Environmental sciences	3.0	3.4	3.6	3.5	3.8	4.0	4.2	4.4	4.7	4.5	4.5	4.7	5.1
Life sciences	29.5	33.1	34.9	37.3	40.9	43.5	45.6	48.1	49.3	51.1	50.8	52.8	55.2
Psychology	10.8	12.8	13.9	14.3	16.4	17.3	18.5	19.2	20.2	20.7	19.5	20.1	20.8
Social sciences	21.6	25.5	28.8	30.3	33.7	34.4	36.1	37.6	39.0	39.0	39.2	37.1	37.7
Engineering	11.3	12.2	13.5	14.3	14.7	16.4	17.9	19.3	20.2	20.1	20.1	20.0	21.5

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-23.
Academic employment of doctoral scientists and engineers, by degree field, race/ethnicity, and type of position: 1973–97
(Thousands)

Field and race/ethnicity	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
White non-Hispanic, total S&E	94.9	106.2	114.3	118.7	128.1	133.4	139.7	146.2	149.8	151.8	148.7	147.1	151.1
Total sciences	84.9	95.6	102.6	106.5	115.4	119.4	124.9	130.3	133.6	135.7	133.1	131.7	134.5
Physical sciences	16.1	17.2	18.0	18.0	18.5	17.8	18.8	19.3	18.9	18.9	18.0	17.8	17.9
Mathematics	8.5	9.5	9.9	10.1	10.3	10.9	11.1	11.4	11.7	12.2	12.3	10.7	11.0
Computer sciences	0.0	0.0	0.0	0.0	0.2	0.3	0.5	0.7	1.0	1.3	1.5	1.9	2.0
Environmental sciences	2.9	3.3	3.5	3.3	3.6	3.8	4.0	4.1	4.4	4.3	4.2	4.3	4.7
Life sciences	27.5	30.4	32.1	33.9	37.2	39.7	41.3	43.3	44.4	46.0	45.1	46.7	48.3
Psychology	10.3	12.1	13.0	13.6	15.4	16.2	17.1	17.9	18.8	19.2	18.0	18.4	18.8
Social sciences	19.7	23.2	26.1	27.5	30.1	30.7	32.2	33.5	34.4	33.8	34.1	31.9	31.8
Engineering	10.0	10.6	11.6	12.2	12.7	14.0	14.8	15.9	16.2	16.2	15.6	15.3	16.7
Asian/Pacific Islander, total S&E	4.0	4.7	5.0	7.8	8.4	9.1	10.9	11.7	12.3	12.6	14.8	14.5	16.5
Total sciences	3.0	3.7	3.9	6.0	6.7	7.2	8.2	8.7	8.9	9.5	11.1	10.9	12.7
Physical sciences	0.7	0.8	0.9	1.3	1.2	1.5	1.6	1.8	1.7	1.7	2.2	2.0	2.2
Mathematics	0.4	0.5	0.5	0.8	0.9	1.0	1.1	1.1	1.3	1.5	1.7	1.6	2.0
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.5	0.7	0.8	0.8
Environmental sciences	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.2
Life sciences	0.9	1.2	1.2	2.1	2.3	2.4	2.8	3.1	3.0	3.0	3.7	3.5	4.1
Psychology	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5
Social sciences	0.9	1.1	1.1	1.5	1.9	1.9	2.1	2.1	2.1	2.4	2.3	2.4	2.8
Engineering	0.9	1.0	1.1	1.8	1.7	1.9	2.7	3.0	3.4	3.1	3.7	3.6	3.8
Underrepresented minorities, total S&E	2.0	2.7	3.2	4.2	5.0	5.4	5.8	6.3	7.4	8.4	8.6	9.8	10.6
Total sciences	1.9	2.5	2.9	3.9	4.8	5.0	5.4	5.9	6.8	7.6	7.8	8.7	9.6
Physical sciences	0.4	0.4	0.4	0.6	0.8	0.8	0.7	0.8	0.8	1.0	1.1	1.0	1.3
Mathematics	0.2	0.2	0.2	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.7	0.6
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Environmental sciences	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Life sciences	0.7	0.9	1.0	1.1	1.3	1.3	1.4	1.6	1.8	2.0	2.0	2.6	2.7
Psychology	0.2	0.3	0.5	0.4	0.6	0.7	0.9	0.9	1.0	1.1	1.1	1.3	1.5
Social sciences	0.4	0.6	0.8	1.4	1.6	1.7	1.8	2.0	2.5	2.8	2.8	2.8	3.1
Engineering	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.8	0.8	1.1	1.0
American Indian/Alaskan Native, total S&E	0.2	0.3	0.4	0.6	0.6	0.7	0.7	0.8	0.9	0.8	0.8	0.8	0.8
Total sciences	0.2	0.3	0.3	0.6	0.6	0.6	0.6	0.7	0.8	0.7	0.8	0.7	0.7
Physical sciences	0.0	0.1	0.0	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Mathematics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life sciences	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Psychology	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Social sciences	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.3	0.4	0.3	0.3	0.3	0.3
Engineering	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-23.
Academic employment of doctoral scientists and engineers, by degree field, race/ethnicity, and type of position: 1973–97
(Thousands)

Field and race/ethnicity	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
Black non-Hispanic, total S&E	1.1	1.4	1.5	1.7	2.3	2.5	2.7	2.8	3.2	4.0	3.8	4.6	5.0
Total sciences	1.1	1.3	1.5	1.6	2.1	2.3	2.6	2.6	3.0	3.6	3.5	4.2	4.5
Physical sciences	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.3	0.3	0.3	0.4	0.6
Mathematics	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life sciences	0.3	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.8	1.0	1.0	1.3	1.3
Psychology	0.1	0.2	0.3	0.2	0.4	0.4	0.5	0.5	0.6	0.7	0.6	0.6	0.7
Social sciences	0.3	0.4	0.4	0.6	0.9	0.9	1.1	1.0	1.1	1.5	1.4	1.5	1.7
Engineering	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.2	0.2	0.3	0.3	0.5	0.4
Hispanic, total S&E	0.7	1.0	1.3	2.0	2.1	2.2	2.4	2.7	3.3	3.7	3.9	4.4	4.8
Total sciences	0.6	0.9	1.2	1.7	2.0	2.0	2.2	2.5	3.0	3.3	3.5	3.8	4.3
Physical sciences	0.1	0.2	0.2	0.3	0.4	0.4	0.4	0.5	0.4	0.6	0.6	0.5	0.7
Mathematics	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1
Environmental sciences	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Life sciences	0.3	0.4	0.4	0.5	0.7	0.6	0.6	0.8	0.9	0.9	0.9	1.2	1.3
Psychology	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.5	0.7
Social sciences	0.1	0.2	0.2	0.5	0.5	0.5	0.5	0.7	0.9	1.0	1.0	1.0	1.1
Engineering	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.6	0.5
Postdoctoral positions													
All, total S&E	4.2	6.2	7.6	8.1	8.5	8.3	8.7	9.3	11.5	9.9	13.3	16.8	18.9
Total sciences	4.0	5.9	7.2	7.8	8.4	8.0	8.5	8.8	10.9	9.4	12.3	15.6	17.2
Physical sciences	1.7	2.1	2.2	1.9	1.9	1.4	1.9	2.0	2.4	1.9	3.0	3.9	3.2
Mathematics	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.0	0.5	0.5
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Environmental sciences	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.6
Life sciences	1.9	3.0	4.0	4.7	5.2	5.1	5.2	5.6	6.8	6.4	8.2	9.2	10.8
Psychology	0.2	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.5	0.4	1.1	1.3
Social sciences	0.1	0.2	0.3	0.3	0.3	0.6	0.3	0.1	0.4	0.3	0.2	0.4	0.7
Engineering	0.2	0.3	0.4	0.3	0.2	0.3	0.2	0.5	0.6	0.5	1.0	1.2	1.7
White non-Hispanic, total S&E	3.6	5.0	6.2	6.8	6.9	6.8	7.1	7.4	9.0	7.1	9.1	11.2	12.5
Total sciences	3.4	4.8	6.0	6.7	6.7	6.8	7.0	7.2	8.7	6.9	8.8	10.7	11.6
Physical sciences	1.4	1.7	1.7	1.5	1.3	1.2	1.3	1.3	1.6	1.2	2.0	2.3	2.0
Mathematics	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.3	0.3
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Environmental sciences	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.4	0.3	0.5
Life sciences	1.7	2.4	3.3	4.1	4.4	4.3	4.5	4.7	5.6	4.8	5.9	6.5	7.0
Psychology	0.1	0.4	0.4	0.6	0.6	0.5	0.7	0.6	0.8	0.4	0.3	0.9	1.1
Social sciences	0.1	0.2	0.3	0.3	0.3	0.5	0.3	0.1	0.3	0.2	0.1	0.3	0.6
Engineering	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.2	0.3	0.5	0.9

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-23.
Academic employment of doctoral scientists and engineers, by degree field, race/ethnicity, and type of position: 1973–97
(Thousands)

Field and race/ethnicity	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
Asian/Pacific Islander, total S&E	0.5	1.0	1.1	1.1	1.4	1.1	1.1	1.6	1.9	2.3	3.6	4.7	5.3
Total sciences	0.4	0.9	1.0	1.0	1.4	0.9	1.1	1.3	1.6	2.0	2.9	4.0	4.7
Physical sciences	0.2	0.4	0.4	0.4	0.6	0.2	0.5	0.6	0.7	0.6	0.9	1.4	1.1
Mathematics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Environmental sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Life sciences	0.2	0.5	0.5	0.5	0.8	0.6	0.6	0.6	0.9	1.3	1.9	2.2	3.2
Psychology	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Social sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engineering	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.3	0.3	0.7	0.7	0.7
Underrepresented minorities, total S&E	0.1	0.1	0.2	0.2	0.2	0.4	0.4	0.4	0.6	0.4	0.6	0.9	1.1
Total sciences	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.3	0.5	0.4	0.6	0.9	1.0
Physical sciences	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1
Mathematics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life sciences	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.4	0.5	0.6
Psychology	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2
Social sciences	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Engineering	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
American Indian/Alaskan Native, total S&E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Total sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Physical sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mathematics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Psychology	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Social sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engineering	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Black non-Hispanic, total S&E	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.3	0.5
Total sciences	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.3	0.5
Physical sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Mathematics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life sciences	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.3
Psychology	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Social sciences	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engineering	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-23.
Academic employment of doctoral scientists and engineers, by degree field, race/ethnicity, and type of position: 1973–97
(Thousands)

Field and race/ethnicity	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
Hispanic, total S&E	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.4	0.3	0.4	0.6	0.5
Total sciences	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.3	0.4	0.6	0.5
Physical sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0
Mathematics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life sciences	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3
Psychology	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1
Social sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Engineering	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Full-time nonfaculty and part-time positions													
All, total S&E	7.3	7.4	7.7	14.5	15.6	15.1	22.6	20.7	23.6	23.4	28.0	29.3	35.3
Total sciences	6.6	6.9	7.2	13.4	14.4	14.1	20.9	19.4	21.7	21.5	26.0	26.8	31.9
Physical sciences	1.9	1.6	1.7	2.6	2.8	3.0	3.6	3.0	3.4	3.5	4.4	4.5	5.6
Mathematics	0.2	0.4	0.5	0.6	0.6	0.4	0.6	0.6	0.7	0.7	0.8	1.1	1.5
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.3
Environmental sciences	0.3	0.2	0.3	0.6	0.6	0.6	0.8	0.9	0.9	1.0	1.4	1.3	1.6
Life sciences	2.3	2.3	2.4	4.5	4.9	4.9	7.3	7.0	8.1	7.8	9.2	9.6	11.3
Psychology	0.9	1.0	1.1	2.5	2.8	2.2	3.4	3.6	3.7	3.5	5.1	5.0	5.2
Social sciences	1.1	1.3	1.2	2.6	2.7	2.9	5.0	4.1	4.8	4.8	5.0	5.0	6.5
Engineering	0.6	0.6	0.5	1.2	1.2	1.1	1.7	1.3	1.9	2.0	2.0	2.5	3.4
White non-Hispanic, total S&E	6.5	6.7	6.8	13.3	14.1	13.4	19.8	18.1	20.7	21.0	24.0	24.3	29.6
Total sciences	6.0	6.2	6.4	12.2	12.9	12.6	18.3	17.1	19.2	19.4	22.4	22.5	27.0
Physical sciences	1.6	1.5	1.5	2.3	2.4	2.5	3.1	2.5	2.8	3.0	3.5	3.7	4.4
Mathematics	0.2	0.3	0.5	0.5	0.5	0.4	0.6	0.5	0.7	0.6	0.6	0.9	1.2
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2
Environmental sciences	0.3	0.2	0.2	0.5	0.5	0.5	0.7	0.8	0.8	1.0	1.3	1.1	1.5
Life sciences	2.0	2.0	2.1	4.0	4.2	4.3	6.4	6.1	7.1	7.0	8.1	8.1	9.5
Psychology	0.9	1.0	1.0	2.3	2.6	2.0	3.1	3.2	3.4	3.2	4.5	4.3	4.5
Social sciences	1.0	1.2	1.1	2.5	2.5	2.7	4.3	3.7	4.3	4.4	4.4	4.3	5.6
Engineering	0.5	0.5	0.4	1.1	1.2	0.8	1.5	1.0	1.5	1.6	1.6	1.8	2.7
Asian/Pacific Islander, total S&E	0.4	0.3	0.5	0.8	0.9	1.3	1.9	1.6	1.8	1.5	2.5	3.2	3.6
Total sciences	0.4	0.3	0.4	0.8	0.9	1.0	1.7	1.3	1.5	1.2	2.2	2.6	2.9
Physical sciences	0.1	0.1	0.1	0.2	0.2	0.4	0.5	0.4	0.4	0.4	0.7	0.7	0.9
Mathematics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Environmental sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.2
Life sciences	0.2	0.1	0.2	0.4	0.5	0.5	0.7	0.7	0.8	0.6	0.8	1.1	1.2
Psychology	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Social sciences	0.0	0.0	0.1	0.1	0.1	0.0	0.4	0.2	0.2	0.2	0.3	0.3	0.4
Engineering	0.1	0.0	0.0	0.1	0.0	0.2	0.2	0.2	0.3	0.2	0.3	0.6	0.7

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-23.
Academic employment of doctoral scientists and engineers, by degree field, race/ethnicity, and type of position: 1973–97
(Thousands)

Field and race/ethnicity	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
Underrepresented minorities, total S&E	0.2	0.2	0.2	0.4	0.5	0.4	0.8	1.0	1.0	0.9	1.5	1.7	2.1
Total sciences	0.2	0.2	0.2	0.4	0.5	0.4	0.8	1.0	0.9	0.8	1.4	1.6	2.0
Physical sciences	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3
Mathematics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life sciences	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.6
Psychology	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.3	0.2	0.2	0.4	0.6	0.6
Social sciences	0.0	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.5
Engineering	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
American Indian/Alaskan Native, total S&E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Total sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1
Physical sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mathematics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Psychology	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Social sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Engineering	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Black non-Hispanic, total S&E	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.4	0.4	0.7	0.9	1.2
Total sciences	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.4	0.4	0.7	0.9	1.1
Physical sciences	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1
Mathematics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.3
Psychology	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.4
Social sciences	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.3
Engineering	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hispanic, total S&E	0.1	0.1	0.1	0.2	0.3	0.2	0.4	0.4	0.6	0.4	0.7	0.7	0.8
Total sciences	0.1	0.1	0.1	0.2	0.3	0.1	0.4	0.4	0.5	0.4	0.5	0.6	0.8
Physical sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Mathematics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Computer sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Life sciences	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2
Psychology	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Social sciences	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Engineering	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0

NOTES: Data exclude university-managed federally funded research and development centers. Due to survey coverage, the data also exclude scientists, and engineers with doctorates from foreign institutions. Field is field of degree. Faculty positions include full, associate, and assistant professors and instructors. Respondents with unknown racial/ethnic classification or faculty status are excluded. Underrepresented minorities are American Indian/Alaskan Native, black, and Hispanic respondents. Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Characteristics of Doctoral Scientists and Engineers in the United States: 1997*, Detailed Statistical Tables, in press (Arlington, VA: 1999).

See figure 6-15 in Volume 1.

Appendix table 6-24.
Age distribution of academic doctoral scientists and engineers, by type of appointment: 1973–97
(Mean and median age, and percent by age group)

Year	Mean Age	Median Age	Total	34 and younger	35–44 years old	45–54 years old	55–64 years old	65 and older
	Years		Percent					
All doctoral scientists and engineers								
1973	42.0	39.6	100.0	28.3	35.2	23.3	10.9	2.2
1975	42.4	39.9	100.0	25.9	36.8	23.7	11.7	2.0
1977	42.7	40.0	100.0	22.9	38.9	23.8	12.4	2.0
1979	43.3	40.7	100.0	20.1	40.3	23.8	13.6	2.2
1981	44.0	41.5	100.0	18.3	40.5	23.7	14.5	2.9
1983	44.8	42.5	100.0	14.9	40.8	25.2	15.7	3.4
1985	45.2	43.2	100.0	14.2	39.2	26.8	15.9	3.8
1987	45.6	44.2	100.0	12.9	36.5	30.6	16.5	3.5
1989	46.1	45.0	100.0	12.1	34.7	32.2	16.9	4.1
1991	46.3	45.3	100.0	11.5	33.7	34.2	16.9	3.8
1993	45.8	45.0	100.0	13.3	33.3	34.4	16.1	3.0
1995	46.2	45.3	100.0	12.7	32.9	33.6	17.4	3.5
1997	46.6	45.8	100.0	13.3	30.7	32.8	19.6	3.6
Full-time faculty								
1973	42.4	40.3	100.0	25.6	36.6	24.6	11.3	2.0
1975	42.8	40.6	100.0	22.9	38.2	25.1	12.0	1.8
1977	43.3	40.9	100.0	19.2	40.1	25.7	13.3	1.7
1979	44.0	41.6	100.0	16.2	41.1	25.9	14.7	2.0
1981	44.7	42.4	100.0	14.7	41.2	25.8	15.7	2.7
1983	45.5	43.4	100.0	11.3	41.2	27.5	17.2	2.8
1985	45.8	43.9	100.0	10.8	39.6	29.0	17.0	3.5
1987	46.6	45.1	100.0	9.2	35.9	33.2	18.1	3.5
1989	47.1	46.0	100.0	8.3	33.8	35.4	18.8	3.8
1991	47.0	46.4	100.0	8.8	32.7	36.8	18.3	3.4
1993	46.9	46.0	100.0	9.3	32.4	36.9	18.0	3.3
1995	47.5	46.9	100.0	8.0	31.9	36.6	19.8	3.8
1997	48.0	47.5	100.0	8.2	29.9	35.6	22.2	4.0
Postdoctorates								
1973	32.1	30.3	100.0	81.2	15.2	3.0	0.6	0.0
1975	32.7	31.2	100.0	78.0	18.7	2.0	1.1	0.2
1977	32.9	31.1	100.0	75.3	21.7	2.4	0.6	0.0
1979	33.1	31.6	100.0	71.7	25.5	2.1	0.7	0.0
1981	33.1	31.6	100.0	71.9	24.6	2.6	0.6	0.3
1983	33.7	31.7	100.0	68.4	27.0	3.5	1.0	0.2
1985	33.3	31.9	100.0	70.6	27.2	2.1	0.1	0.0
1987	33.8	32.0	100.0	68.4	28.3	2.4	0.5	0.4
1989	34.6	32.6	100.0	63.9	29.9	4.5	1.0	0.7
1991	34.7	33.1	100.0	57.2	39.0	2.8	1.0	0.0
1993	33.9	32.7	100.0	62.3	34.7	2.5	0.5	0.0
1995	35.0	33.0	100.0	56.6	35.9	5.8	1.6	0.1
1997	35.0	33.0	100.0	60.7	32.3	4.6	2.1	0.3
All other types of appointment								
1973	41.9	38.2	100.0	34.6	30.3	18.7	10.9	5.4
1975	43.3	40.0	100.0	27.5	32.0	21.8	13.4	5.4
1977	42.5	38.3	100.0	28.4	37.4	17.5	10.6	6.1
1979	42.5	38.6	100.0	25.2	41.6	17.0	10.9	5.2
1981	43.3	39.6	100.0	21.8	43.6	17.0	11.1	6.4
1983	44.1	39.9	100.0	19.3	43.6	17.5	10.6	8.9
1985	45.3	42.5	100.0	15.9	41.0	21.6	14.7	6.8
1987	43.9	41.1	100.0	16.9	43.9	23.3	10.9	5.0
1989	44.9	42.2	100.0	14.2	43.3	23.5	11.2	7.8
1991	46.1	44.0	100.0	11.6	38.2	28.7	14.2	7.3
1993	44.6	43.2	100.0	14.2	37.9	33.9	11.3	2.7
1995	44.8	43.5	100.0	15.0	37.0	31.7	12.4	3.8
1997	45.8	44.7	100.0	13.4	33.9	33.5	15.7	3.4

NOTES: Faculty positions include full, associate, and assistant professors and instructors. Details may not add to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Doctorate Recipients, special tabulations.

See figure 6-16 in Volume 1.

Appendix table 6-25.
Age distribution of full-time doctoral S&E faculty at research universities and other academic institutions: 1973–97
(Percentages)

Age bracket	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
All universities and colleges													
Total number (thousands)	*103.3*	*116.3*	*125.6*	*131.2*	*141.9*	*148.4*	*156.9*	*164.4*	*169.7*	*173.0*	*172.4*	*171.3*	*178.4*
Under 30	3.6	2.9	2.3	1.7	1.5	1.1	1.0	0.7	0.5	0.8	1.1	0.7	0.8
30–34	22.0	20.1	16.9	14.5	13.2	10.2	9.9	8.5	7.8	8.1	8.3	7.3	7.5
35–39	19.9	21.6	23.7	23.3	20.7	18.6	18.2	15.9	15.1	14.9	15.3	14.9	13.1
40–44	16.6	16.6	16.4	17.8	20.5	22.6	21.4	20.0	18.6	17.8	17.1	17.0	16.7
45–49	13.6	13.8	14.3	14.1	13.8	15.1	17.0	20.1	20.8	19.4	18.4	17.9	17.2
50–54	11.0	11.3	11.4	11.8	12.0	12.4	12.0	13.1	14.6	17.4	18.5	18.7	18.5
55–59	7.0	7.5	8.4	9.3	9.4	10.3	9.7	10.5	11.1	11.0	10.6	12.4	14.5
60–64	4.3	4.6	4.8	5.4	6.3	7.0	7.3	7.6	7.7	7.2	7.5	7.4	7.7
65+	2.0	1.8	1.7	2.0	2.7	2.8	3.5	3.5	3.8	3.4	3.3	3.8	4.0
Research universities[a]													
Total number (thousands)	*55.7*	*61.4*	*64.7*	*67.1*	*73.8*	*72.2*	*80.6*	*84.2*	*86.6*	*85.8*	*84.3*	*81.6*	*81.5*
Under 30	3.4	3.0	2.5	2.2	2.1	1.4	1.2	1.0	0.6	0.8	1.2	0.9	0.9
30–34	20.6	18.8	16.4	14.9	14.1	11.2	11.4	9.8	9.3	9.1	9.4	7.3	7.0
35–39	19.3	20.3	21.0	21.7	19.8	18.0	17.9	16.6	17.1	16.6	16.6	16.4	14.0
40–44	16.4	16.3	16.2	17.2	18.8	20.2	20.0	18.7	17.2	17.5	17.6	18.4	17.6
45–49	14.3	14.2	14.7	13.9	12.6	14.9	15.4	17.8	18.4	17.8	16.9	16.9	17.3
50–54	11.4	12.2	12.3	12.1	12.1	12.1	12.0	12.9	13.8	15.6	16.0	16.5	17.3
55–59	7.7	8.3	9.3	10.0	10.4	10.8	9.8	10.3	10.9	10.7	11.0	11.8	13.5
60–64	4.8	5.0	5.4	5.8	6.8	8.0	8.2	8.5	8.0	7.7	7.8	7.5	7.8
65+	2.1	1.9	2.2	2.3	3.2	3.5	4.1	4.3	4.8	4.2	3.7	4.2	4.7
Other types of universities and colleges													
Total number (thousands)	*47.6*	*54.9*	*60.9*	*64.1*	*68.2*	*76.2*	*76.2*	*80.2*	*83.1*	*87.3*	*88.0*	*89.7*	*96.8*
Under 30	3.8	2.8	2.1	1.2	0.9	0.8	0.8	0.4	0.4	0.8	0.9	0.6	0.7
30–34	23.6	21.4	17.5	14.1	12.2	9.4	8.2	7.1	6.3	7.1	7.3	7.2	7.9
35–39	20.7	23.0	26.5	25.1	21.6	19.1	18.5	15.2	13.1	13.1	14.1	13.5	12.5
40–44	16.8	17.0	16.6	18.4	22.3	24.9	22.8	21.3	20.1	18.1	16.7	15.7	16.0
45–49	12.8	13.3	13.9	14.3	15.0	15.2	18.8	22.5	23.4	20.9	19.9	18.8	17.1
50–54	10.5	10.3	10.4	11.6	11.8	12.7	12.0	13.4	15.4	19.2	20.8	20.6	19.5
55–59	6.3	6.5	7.5	8.5	8.4	9.8	9.6	10.8	11.2	11.3	10.2	12.9	15.4
60–64	3.6	4.2	4.2	5.1	5.8	5.9	6.3	6.6	7.4	6.8	7.1	7.2	7.5
65+	1.8	1.6	1.2	1.7	2.0	2.2	2.9	2.6	2.7	2.7	3.0	3.3	3.5

NOTE: Faculty positions include full, associate, and assistant professors and instructors. Italics = rounded numbers; all other numbers are percentages.

[a]Research universities are designated by Carnegie classification code (see Carnegie Foundation for the Advancement of Teaching, *A Classification of Institutions of Higher Education*, 1994 ed., Princeton: Princeton University Press, 1994).

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Doctorate Recipients, special tabulations.

See figure 6-17 in Volume 1.

Appendix table 6-26.
Employment sector of recent S&E Ph.D.s, by sex and race/ethnicity: 1973–97
(Thousands)

Sector	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
All recent S&E Ph.D.s													
Total	45.9	45.0	43.3	40.8	42.0	42.8	43.9	44.9	47.9	53.7	49.8	52.1	57.6
Academia	25.0	23.4	22.5	20.9	20.7	20.5	21.8	21.1	23.3	25.5	25.1	26.9	29.0
Full-time faculty (percent)	*76*	*73*	*67*	*60*	*57*	*58*	*55*	*52*	*48*	*57*	*48*	*41*	*41*
Postdoctorates (percent)	*13*	*19*	*24*	*25*	*29*	*29*	*28*	*30*	*34*	*28*	*33*	*40*	*41*
Other (percent)	*10*	*8*	*9*	*15*	*14*	*13*	*17*	*18*	*18*	*15*	*19*	*19*	*18*
Business	8.8	10.0	9.2	9.1	11.7	12.3	11.7	9.8	10.7	12.9	12.8	13.8	17.1
Government	5.5	5.1	4.8	4.1	3.7	3.9	3.7	3.8	3.8	4.4	4.6	4.4	5.2
All other	5.7	5.8	6.0	6.0	5.4	5.6	6.1	9.5	9.2	10.0	6.5	6.3	6.4
Men													
Total	41.2	39.1	36.5	33.2	32.6	32.3	32.2	32.3	34.0	37.0	33.9	34.0	38.0
Academia	21.9	19.5	18.2	16.4	15.5	14.7	15.5	14.9	16.1	16.7	16.8	16.7	17.7
Full-time faculty (percent)	*78*	*75*	*68*	*60*	*59*	*60*	*58*	*53*	*49*	*58*	*48*	*41*	*40*
Postdoctorates (percent)	*13*	*18*	*24*	*25*	*28*	*28*	*28*	*32*	*36*	*29*	*36*	*42*	*44*
Other (percent)	*9*	*7*	*8*	*14*	*12*	*11*	*14*	*15*	*15*	*13*	*16*	*18*	*16*
Business	8.6	9.6	8.4	8.2	10.0	10.3	9.7	8.2	8.8	10.6	10.0	10.7	13.6
Government	5.2	4.7	4.3	3.5	3.0	3.0	2.8	2.8	2.8	3.3	3.1	2.8	3.4
All other	4.8	4.7	4.7	4.5	3.7	3.9	3.8	5.9	5.6	5.8	3.5	3.3	3.3
Women													
Total	4.7	5.9	6.9	7.6	9.4	10.4	11.7	12.6	13.9	16.7	15.8	18.1	19.6
Academia	3.1	3.9	4.3	4.5	5.2	5.8	6.3	6.2	7.3	8.8	8.3	10.2	11.4
Full-time faculty (percent)	*65*	*65*	*63*	*58*	*51*	*53*	*50*	*51*	*47*	*54*	*47*	*43*	*42*
Postdoctorates (percent)	*14*	*22*	*24*	*25*	*29*	*30*	*28*	*26*	*30*	*27*	*29*	*37*	*38*
Other (percent)	*21*	*13*	*12*	*17*	*19*	*17*	*22*	*24*	*23*	*20*	*24*	*21*	*21*
Business	0.3	0.4	0.7	0.9	1.6	2.0	2.1	1.6	1.9	2.4	2.8	3.1	3.5
Government	0.4	0.4	0.5	0.7	0.8	0.9	0.9	1.0	1.0	1.1	1.5	1.6	1.8
All other	0.9	1.1	1.3	1.5	1.7	1.7	2.3	3.6	3.6	4.2	3.0	3.0	3.0
White													
Total	41.1	38.5	36.5	34.5	35.3	35.4	36.2	36.3	37.4	40.3	36.1	35.9	38.7
Academia	23.4	21.0	20.0	18.6	18.3	17.6	18.7	17.7	18.9	20.0	18.6	19.3	20.6
Full-time faculty (percent)	*7*	*72*	*66*	*59*	*58*	*57*	*55*	*53*	*49*	*57*	*50*	*46*	*45*
Postdoctorates (percent)	*12*	*17*	*21*	*25*	*27*	*27*	*27*	*28*	*32*	*25*	*30*	*35*	*37*
Other (percent)	*13*	*11*	*12*	*16*	*15*	*15*	*18*	*19*	*19*	*19*	*21*	*19*	*19*
Business	7.6	8.0	7.1	6.9	9.0	9.6	9.5	7.6	8.0	8.7	8.1	8.4	9.4
Government	5.1	4.6	4.2	3.8	3.3	3.5	2.9	3.4	3.2	3.7	3.8	3.5	3.8
All other	4.9	4.9	5.1	5.1	4.6	4.6	5.1	7.6	7.2	7.6	5.5	4.8	4.8
Asian/Pacific Islander													
Total	2.9	4.1	4.5	4.2	4.8	4.9	5.2	6.0	7.5	9.9	10.6	12.6	15.1
Academia	1.2	1.7	1.8	1.6	1.8	2.1	2.4	2.6	3.4	4.2	5.5	6.3	6.2
Full-time faculty (percent)	*53*	*45*	*41*	*47*	*30*	*46*	*47*	*40*	*40*	*42*	*37*	*27*	*24*
Postdoctorates (percent)	*29*	*45*	*46*	*39*	*56*	*35*	*33*	*45*	*44*	*44*	*49*	*56*	*61*
Other (percent)	*18*	*9*	*13*	*15*	*14*	*19*	*19*	*14*	*17*	*14*	*14*	*17*	*15*
Business	1.0	1.6	1.8	1.8	2.4	2.1	1.8	1.7	2.3	3.5	4.0	4.7	7.0
Government	0.2	0.3	0.3	0.2	0.2	0.2	0.5	0.2	0.3	0.4	0.4	0.6	0.9
All other	0.4	0.5	0.6	0.5	0.5	0.6	0.5	1.4	1.4	1.7	0.7	1.0	1.1
Underrepresented minorities													
Total	1.0	1.5	1.7	2.0	1.8	2.3	2.3	2.6	3.0	3.4	3.0	3.4	3.7
Academia	0.6	0.9	1.0	1.2	0.9	1.1	1.2	1.3	1.7	1.8	1.7	1.9	2.2
Full-time faculty (percent)	*74*	*84*	*77*	*78*	*76*	*64*	*60*	*57*	*53*	*72*	*60*	*47*	*51*
Postdoctorates (percent)	*10*	*8*	*13*	*12*	*9*	*18*	*21*	*21*	*26*	*15*	*23*	*31*	*30*
Other (percent)	*16*	*8*	*10*	*10*	*14*	*18*	*19*	*22*	*20*	*13*	*17*	*22*	*19*
Business	0.1	0.2	0.2	0.3	0.3	0.5	0.4	0.4	0.4	0.7	0.6	0.7	0.7
Government	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
All other	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.7	0.6	0.4	0.5	0.5

NOTES: Recent Ph.D.s are those who have earned their doctorate within the three years preceding the survey year. "Other" includes part-time faculty. Underrepresented minorities are American Indian/Alaskan Native, black, and Hispanic respondents. Details may not add to totals because of omission of a small number of respondents with unknown employment sector and unknown racial/ethnic group and because of rounding. All percentages are calculated based on number of respondents with known appointment types. Italics = percentages.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Doctorate Recipients, special tabulations.

See page 6-26 in Volume 1.

Appendix table 6-27.
Recent S&E Ph.D.s employed in higher education, by field and type of appointment: 1973–97
(Thousands)

Appointment	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
Science & engineering													
Total	25.0	23.4	22.5	20.9	20.7	20.5	21.8	21.1	23.3	25.5	25.1	26.9	29.0
Faculty	18.8	16.8	15.0	12.8	12.0	11.8	12.5	11.0	11.4	14.4	12.4	11.6	12.5
Postdoctorate	3.2	4.3	5.2	5.2	5.9	5.7	6.0	6.3	7.8	7.0	8.4	10.7	12.0
Other	2.1	1.5	1.4	2.6	2.6	2.3	3.0	3.5	3.7	3.4	4.3	4.6	4.5
Physical sciences													
Total	4.1	3.1	3.0	2.2	2.2	2.0	2.5	2.4	2.9	2.9	3.4	3.8	3.5
Faculty	1.9	1.2	1.2	0.8	0.7	0.6	0.8	0.7	0.8	1.0	0.9	0.7	0.7
Postdoctorate	1.3	1.4	1.5	1.1	1.3	1.1	1.5	1.4	1.7	1.4	2.1	2.4	2.3
Other	0.6	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.4	0.3	0.6	0.6
Mathematics													
Total	2.3	1.9	1.8	1.3	1.1	1.1	1.1	1.1	1.1	1.6	1.6	1.2	1.6
Faculty	2.2	1.7	1.5	1.2	1.0	1.0	1.0	0.8	0.9	1.3	1.4	0.8	1.0
Postdoctorate	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.3	0.3
Other	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.3
Computer sciences													
Total	NA	NA	NA	0.1	0.3	0.2	0.4	0.5	0.6	0.7	0.7	0.8	0.8
Faculty	NA	NA	NA	0.1	0.2	0.2	0.3	0.4	0.6	0.7	0.6	0.6	0.6
Postdoctorate	NA	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Other	NA	NA	NA	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Environmental sciences													
Total	0.7	0.8	0.7	0.6	0.6	0.6	0.6	0.8	0.6	0.7	0.7	0.9	0.9
Faculty	0.5	0.6	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.3	0.3
Postdoctorate	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.4	0.4
Other	0.1	0.1	0.0	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1
Life sciences													
Total	7.1	6.9	6.6	6.7	7.3	7.3	7.4	7.4	8.2	8.9	8.8	10.2	10.8
Faculty	4.6	4.0	3.2	2.8	2.9	3.1	2.8	2.6	2.5	3.4	2.5	3.0	2.9
Postdoctorate	1.5	2.2	2.8	3.2	3.6	3.5	3.4	3.6	4.4	4.4	4.8	5.6	6.5
Other	0.6	0.4	0.4	0.7	0.8	0.7	1.0	1.0	1.2	0.9	1.5	1.5	1.4
Psychology													
Total	2.6	2.8	3.0	3.1	2.9	2.7	3.0	2.7	2.9	2.8	2.6	2.9	3.4
Faculty	2.2	2.3	2.3	2.0	1.7	1.8	1.7	1.4	1.5	1.8	1.4	1.5	1.8
Postdoctorate	0.1	0.3	0.3	0.4	0.5	0.3	0.5	0.4	0.6	0.3	0.2	0.7	0.8
Other	0.2	0.2	0.2	0.6	0.6	0.4	0.7	0.8	0.8	0.6	1.0	0.8	0.7
Social sciences													
Total	5.8	5.9	5.5	5.3	4.9	4.4	4.6	4.0	4.0	4.5	4.3	4.0	4.9
Faculty	5.5	5.4	5.0	4.5	4.0	3.5	3.6	3.1	2.8	3.7	3.4	3.1	3.6
Postdoctorate	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.0	0.2	0.1	0.1	0.2	0.4
Other	0.2	0.3	0.3	0.5	0.7	0.5	0.8	0.8	0.9	0.6	0.8	0.7	0.9
Engineering													
Total	2.4	1.9	1.9	1.6	1.4	2.0	2.3	2.3	3.0	3.3	3.0	3.2	3.1
Faculty	2.0	1.5	1.4	1.2	1.2	1.4	1.9	1.6	2.0	2.3	1.9	1.6	1.6
Postdoctorate	0.1	0.2	0.3	0.2	0.2	0.3	0.2	0.4	0.5	0.4	0.7	1.0	1.1
Other	0.3	0.2	0.1	0.3	0.1	0.2	0.1	0.3	0.4	0.5	0.4	0.6	0.4

NA = not available

NOTES: Omits respondents with unknown type of appointment. Recent Ph.D.s are those who have earned their doctorate within the three years preceding the survey year. "Faculty" includes full-time and part-time full, associate, and assistant professors and instructors. Details may not add to totals because of rounding and omission of respondents with unknown appointment type.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Doctorate Recipients, special tabulations.

See figure 6-18 in Volume 1.

Appendix table 6-28.
Academic doctoral scientists and engineers with work responsibility for R&D, by type of appointment and degree field: 1973–97

Field	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
Total employment (thousands)													
Total science & engineering	118.0	134.1	145.4	155.3	167.1	176.1	190.2	195.9	206.6	210.6	213.8	217.5	232.5
Total sciences	105.6	120.6	130.7	139.5	150.9	157.9	170.3	174.7	183.8	187.8	190.6	193.7	205.9
Physical sciences	22.1	23.6	25.0	24.6	25.3	25.1	27.0	27.2	27.7	27.7	28.6	29.3	30.2
Mathematics	9.7	11.0	11.7	12.2	12.4	12.9	13.6	13.8	14.5	15.2	15.5	14.6	15.6
Computer sciences	NA	NA	NA	0.1	0.3	0.5	0.8	1.1	1.5	2.0	2.5	3.1	3.3
Environmental sciences	3.4	3.9	4.2	4.2	4.6	4.8	5.2	5.6	5.9	6.0	6.4	6.4	7.3
Life sciences	34.9	39.4	42.6	47.0	51.3	54.8	58.7	61.2	64.8	66.9	68.2	71.6	77.3
Psychology	12.2	14.8	16.2	17.7	20.1	21.0	23.1	23.7	25.0	25.2	25.0	26.1	27.3
Social sciences	23.4	28.0	31.1	33.6	36.9	38.8	41.9	42.1	44.5	44.8	44.4	42.5	44.9
Engineering	12.4	13.4	14.8	15.8	16.1	18.1	19.9	21.2	22.8	22.8	23.1	23.8	26.6
Total active in R&D[a] (thousands)													
Total science & engineering	82.3	90.6	85.0	90.0	100.7	104.7	115.2	144.0	151.6	156.6	150.1	153.5	164.7
Total sciences	73.2	81.6	76.1	80.2	91.2	93.5	102.7	127.2	133.9	138.4	132.6	135.0	143.8
Physical sciences	16.3	16.9	16.3	15.4	16.3	16.1	17.7	20.3	20.8	20.8	20.0	20.6	21.8
Mathematics	6.8	7.5	6.8	6.9	6.8	7.2	7.6	9.7	10.2	10.7	9.5	9.4	10.1
Computer sciences	NA	NA	NA	0.1	0.3	0.4	0.6	1.0	1.3	1.7	2.0	2.4	2.4
Environmental sciences	2.5	2.8	2.9	2.7	3.2	3.3	3.7	4.6	4.9	5.1	5.0	5.1	5.6
Life sciences	26.0	29.0	28.7	32.1	37.1	38.3	41.4	48.8	51.8	53.3	51.8	53.8	57.9
Psychology	7.3	8.5	7.7	8.3	9.9	10.5	10.7	14.3	14.3	15.7	14.9	15.6	16.1
Social sciences	14.3	16.9	13.8	14.7	17.6	17.8	20.9	28.5	30.5	31.1	29.3	28.1	29.8
Engineering	9.0	9.0	8.9	9.8	9.5	11.2	12.5	16.8	17.6	18.2	17.5	18.5	20.9
Percentage of total employed who are active in R&D[a]													
Total science & engineering	70	68	58	58	60	59	61	73	73	74	70	71	71
Total sciences	69	68	58	57	60	59	60	73	73	74	70	70	70
Physical sciences	74	72	65	63	64	64	66	75	75	75	70	70	72
Mathematics	70	68	58	57	55	56	56	70	71	71	62	64	65
Computer sciences	NA	NA	NA	86	97	74	75	90	89	86	79	76	73
Environmental sciences	72	73	69	65	70	68	71	83	84	84	78	80	77
Life sciences	75	74	67	68	72	70	71	80	80	80	76	75	75
Psychology	60	57	48	47	49	50	46	60	57	62	60	60	59
Social sciences	61	60	44	44	48	46	50	68	69	69	66	66	66
Engineering	73	67	60	62	59	62	63	79	77	80	76	78	79
Percentage of total employed with primary R&D responsibility													
Total science & engineering	24	23	25	27	28	28	29	34	35	35	38	38	38
Total sciences	24	24	26	27	29	28	30	35	36	36	38	38	38
Physical sciences	27	27	32	31	31	31	35	38	39	38	42	43	42
Mathematics	16	13	15	17	16	15	20	23	24	23	22	22	23
Computer sciences	NA	NA	NA	30	39	39	47	62	52	54	35	33	32
Environmental sciences	20	21	24	24	29	31	31	38	40	41	42	40	39
Life sciences	37	37	39	42	45	44	46	51	52	52	53	53	52
Psychology	17	15	17	19	20	21	20	22	24	25	27	28	29
Social sciences	12	11	13	12	12	13	14	18	18	19	24	23	22
Engineering	17	17	20	21	21	21	22	29	30	31	34	37	38

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-28.
Academic doctoral scientists and engineers with work responsibility for R&D, by type of appointment and degree field: 1973–97

Field	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
Full-time faculty (thousands)													
Total science & engineering	103.3	116.4	125.6	131.2	141.9	148.4	156.9	164.4	169.8	173.1	172.4	171.4	178.4
Total sciences	92.0	104.2	112.2	116.9	127.2	132.0	139.0	145.1	149.5	153.1	152.3	151.3	156.8
Physical sciences	17.8	18.9	20.0	20.0	20.5	20.2	21.2	22.0	21.5	21.7	21.3	20.9	21.4
Mathematics	9.3	10.4	10.9	11.4	11.7	12.3	12.7	12.9	13.5	14.2	14.7	13.0	13.6
Computer sciences	NA	NA	NA	0.1	0.3	0.4	0.7	0.9	1.3	1.8	2.3	2.8	3.0
Environmental sciences	3.0	3.4	3.6	3.5	3.8	4.0	4.2	4.4	4.7	4.5	4.5	4.7	5.1
Life sciences	29.5	33.1	34.9	37.3	40.9	43.5	45.6	48.1	49.3	51.1	50.8	52.8	55.2
Psychology	10.8	12.8	13.9	14.3	16.4	17.3	18.5	19.2	20.2	20.7	19.5	20.1	20.8
Social sciences	21.6	25.5	28.8	30.3	33.7	34.4	36.1	37.6	39.0	39.0	39.2	37.1	37.7
Engineering	11.3	12.2	13.5	14.3	14.7	16.4	17.9	19.3	20.2	20.1	20.1	20.0	21.5
Full-time faculty active in R&D[a] (thousands)													
Total science & engineering	72.0	78.9	71.6	74.1	83.8	86.9	95.1	121.4	125.8	131.4	121.7	121.6	127.0
Total sciences	63.8	70.6	63.6	65.2	75.0	76.7	83.7	106.2	110.1	115.2	106.6	106.2	110.3
Physical sciences	13.0	13.4	12.4	11.7	12.5	12.5	13.4	16.1	16.0	16.4	14.4	14.2	14.9
Mathematics	6.6	7.1	6.4	6.4	6.5	6.9	7.3	9.1	9.8	10.2	9.1	8.4	8.9
Computer sciences	NA	NA	NA	0.0	0.2	0.3	0.5	0.8	1.2	1.6	1.8	2.2	2.2
Environmental sciences	2.1	2.5	2.5	2.2	2.6	2.6	2.9	3.6	4.0	3.8	3.6	3.7	3.9
Life sciences	21.8	24.1	22.9	24.7	28.7	29.6	31.9	38.3	39.0	41.0	38.4	39.5	41.2
Psychology	6.6	7.5	6.7	6.6	8.0	8.8	9.0	12.1	12.2	13.9	12.6	12.9	13.3
Social sciences	13.6	15.9	12.9	13.5	16.5	16.0	18.8	26.1	27.9	28.3	26.6	25.3	25.8
Engineering	8.2	8.3	8.0	8.9	8.8	10.2	11.4	15.2	15.7	16.2	15.1	15.5	16.7
Percentage of full-time faculty who are active in R&D[a]													
Total science & engineering	70	68	57	56	59	59	61	74	74	76	71	71	71
Total sciences	69	68	57	56	59	58	60	73	74	75	70	70	70
Physical sciences	73	71	62	59	61	62	63	73	74	76	68	68	70
Mathematics	71	68	58	56	55	56	57	70	72	72	62	64	65
Computer sciences	NA	NA	NA	81	96	74	72	88	90	88	80	76	76
Environmental sciences	71	72	68	63	67	65	69	83	84	83	80	79	77
Life sciences	74	73	66	66	70	68	70	80	79	80	76	75	75
Psychology	61	58	48	46	49	51	49	63	60	67	64	64	64
Social sciences	63	62	45	45	49	47	52	69	72	73	68	68	68
Engineering	73	68	60	62	60	62	64	79	78	81	75	77	77
Percentage of full-time faculty with primary R&D responsibility													
Total science & engineering	19	18	21	21	22	23	25	30	30	31	33	33	33
Total sciences	20	19	21	22	23	23	26	30	31	32	33	33	33
Physical sciences	17	18	22	22	22	22	26	30	30	31	33	33	32
Mathematics	15	12	14	16	15	15	19	21	24	23	21	21	21
Computer sciences	NA	NA	NA	5	34	32	41	60	52	55	32	31	33
Environmental sciences	15	15	18	17	21	23	22	29	33	32	35	31	31
Life sciences	32	31	33	35	38	38	41	46	46	47	47	47	47
Psychology	15	12	14	15	15	17	18	20	22	24	27	27	28
Social sciences	11	11	12	11	11	11	13	17	18	18	23	22	20
Engineering	13	14	17	18	19	18	21	26	27	28	30	31	31

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-28.
Academic doctoral scientists and engineers with work responsibility for R&D, by type of appointment and degree field: 1973–97

Field	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
Postdoctorates (thousands)													
Total science & engineering	4.2	6.2	7.6	8.1	8.5	8.3	8.7	9.3	11.5	9.9	13.3	16.8	18.9
Total sciences	4.0	5.9	7.2	7.8	8.4	8.0	8.5	8.8	10.9	9.4	12.3	15.6	17.2
Physical sciences	1.7	2.1	2.2	1.9	1.9	1.4	1.9	2.0	2.4	1.9	3.0	3.9	3.2
Mathematics	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.0	0.5	0.5
Computer sciences	NA	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Environmental sciences	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.6
Life sciences	1.9	3.0	4.0	4.7	5.2	5.1	5.2	5.6	6.8	6.4	8.2	9.2	10.8
Psychology	0.2	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.5	0.4	1.1	1.3
Social sciences	0.1	0.2	0.3	0.3	0.3	0.6	0.3	0.1	0.4	0.3	0.2	0.4	0.7
Engineering	0.2	0.3	0.4	0.3	0.2	0.3	0.2	0.5	0.6	0.5	1.0	1.2	1.7
Postdoctorates active in R&D[a] (thousands)													
Total science & engineering	4.0	5.9	7.1	7.4	8.0	7.4	7.8	8.9	10.8	9.4	13.3	16.1	18.0
Total sciences	3.8	5.7	6.8	7.1	7.9	7.2	7.6	8.4	10.3	9.0	12.3	14.9	16.3
Physical sciences	1.6	2.1	2.2	1.9	1.8	1.4	1.8	1.9	2.3	1.8	3.0	3.8	3.1
Mathematics	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.0	0.5	0.4
Computer sciences	NA	NA	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Environmental sciences	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.5
Life sciences	1.8	2.9	3.7	4.1	4.9	4.6	4.9	5.3	6.5	6.1	8.2	9.0	10.5
Psychology	0.1	0.3	0.4	0.5	0.6	0.5	0.5	0.6	0.7	0.4	0.4	0.9	1.1
Social sciences	0.1	0.2	0.3	0.3	0.2	0.4	0.2	0.1	0.3	0.2	0.2	0.4	0.6
Engineering	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.5	0.5	0.5	1.0	1.2	1.6
Percentage of postdoctorates who are active in R&D[a]													
Total science & engineering	96	95	93	91	94	90	90	95	94	96	100	96	95
Total sciences	96	95	94	91	94	90	90	95	94	95	100	96	95
Physical sciences	98	98	99	98	99	97	97	96	97	99	100	96	97
Mathematics	100	97	86	100	98	78	80	100	97	100	100	99	97
Computer sciences	NA	NA	NA	100	100	100	100	100	87	87	100	91	77
Environmental sciences	100	100	100	92	100	100	99	96	97	100	100	100	88
Life sciences	96	95	93	89	93	91	93	95	96	96	100	97	97
Psychology	89	86	80	85	92	79	67	87	82	90	100	80	84
Social sciences	75	85	89	89	78	74	52	98	72	74	100	84	87
Engineering	94	92	84	81	100	86	100	95	92	99	100	99	99
Percentage of postdoctorates with primary R&D responsibility													
Total science & engineering	92	92	89	85	91	86	87	90	89	93	95	90	89
Total sciences	93	92	90	86	90	86	86	89	89	93	95	90	89
Physical sciences	95	95	96	93	98	97	96	92	95	96	95	91	90
Mathematics	83	67	68	74	78	76	77	84	72	100	100	75	67
Computer sciences	NA	NA	NA	100	100	100	100	100	87	87	92	91	63
Environmental sciences	100	100	87	92	100	91	93	92	93	100	89	90	85
Life sciences	93	92	90	85	90	88	89	91	93	93	97	94	94
Psychology	83	82	72	81	84	70	57	66	65	90	84	71	69
Social sciences	65	76	78	65	63	59	48	78	38	53	85	61	66
Engineering	84	87	80	66	100	86	98	94	91	97	88	89	85

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-28.
Academic doctoral scientists and engineers with work responsibility for R&D, by type of appointment and degree field: 1973–97

Field	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
All others[b] (thousands)													
Total science & engineering	7.3	7.4	7.7	14.5	15.6	15.1	22.6	20.7	23.6	23.4	28.0	29.3	35.3
Total sciences	6.6	6.9	7.2	13.4	14.4	14.1	20.9	19.4	21.7	21.5	26.0	26.8	31.9
Physical sciences	1.9	1.6	1.7	2.6	2.8	3.0	3.6	3.0	3.4	3.5	4.4	4.5	5.6
Mathematics	0.2	0.4	0.5	0.6	0.6	0.4	0.6	0.6	0.7	0.7	0.8	1.1	1.5
Computer sciences	NA	NA	NA	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.3
Environmental sciences	0.3	0.2	0.3	0.6	0.6	0.6	0.8	0.9	0.9	1.0	1.4	1.3	1.6
Life sciences	2.3	2.3	2.4	4.5	4.9	4.9	7.3	7.0	8.1	7.8	9.2	9.6	11.3
Psychology	0.9	1.0	1.1	2.5	2.8	2.2	3.4	3.6	3.7	3.5	5.1	5.0	5.2
Social sciences	1.1	1.3	1.2	2.6	2.7	2.9	5.0	4.1	4.8	4.8	5.0	5.0	6.5
Engineering	0.6	0.6	0.5	1.2	1.2	1.1	1.7	1.3	1.9	2.0	2.0	2.5	3.4
Others active in R&D[a] (thousands)													
Total science & engineering	4.5	4.2	4.4	7.9	8.4	8.6	11.4	12.8	14.0	13.5	15.1	15.7	19.8
Total sciences	4.0	3.8	4.0	7.2	7.9	8.0	10.7	11.8	12.7	12.1	13.7	13.9	17.2
Physical sciences	1.2	1.0	1.2	1.7	1.9	1.9	2.4	2.1	2.4	2.2	2.6	2.7	3.8
Mathematics	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.8
Computer sciences	NA	NA	NA	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1
Environmental sciences	0.2	0.2	0.2	0.4	0.4	0.5	0.6	0.7	0.7	0.9	0.9	1.0	1.2
Life sciences	1.5	1.5	1.5	2.9	3.3	3.3	4.4	4.9	5.8	5.2	5.2	5.4	6.2
Psychology	0.4	0.5	0.4	1.0	1.3	1.0	1.1	1.4	1.3	1.2	2.0	1.8	1.7
Social sciences	0.5	0.5	0.5	0.8	0.8	1.1	1.8	2.2	2.2	2.2	2.5	2.4	3.4
Engineering	0.5	0.3	0.4	0.7	0.5	0.6	0.8	1.0	1.3	1.4	1.4	1.8	2.6
Percentage of others who are active in R&D[a]													
Total science & engineering	61	56	57	54	54	57	51	62	59	58	54	54	56
Total sciences	60	56	56	53	55	57	51	61	59	57	53	52	54
Physical sciences	67	59	70	65	67	64	65	70	69	64	60	59	67
Mathematics	50	53	52	53	43	44	36	55	40	48	50	49	56
Computer sciences	NA	NA	NA	NA	100	73	95	99	89	62	69	69	40
Environmental sciences	80	78	78	73	76	78	76	82	77	85	65	76	71
Life sciences	66	66	62	63	67	68	60	70	71	67	56	56	55
Psychology	49	47	40	41	45	48	33	40	36	34	39	35	33
Social sciences	43	37	37	32	29	37	37	52	45	45	50	48	52
Engineering	74	56	72	62	42	53	47	80	68	70	70	72	76

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-28.
Academic doctoral scientists and engineers with work responsibility for R&D, by type of appointment and degree field: 1973–97

Field	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
	Percentage of others with primary R&D responsibility												
Total science & engineering	41	37	40	40	43	45	38	43	41	40	38	39	39
Total sciences	40	37	39	39	43	45	38	43	41	39	38	37	37
Physical sciences	51	45	57	50	54	51	52	57	58	55	47	47	56
Mathematics	11	24	21	28	17	21	20	30	18	37	31	20	29
Computer sciences	NA	NA	NA	NA	25	72	83	74	48	37	56	44	10
Environmental sciences	53	62	55	55	61	66	63	68	64	57	47	57	48
Life sciences	50	48	46	51	58	57	49	55	55	50	43	45	41
Psychology	28	29	28	28	35	39	25	23	22	20	21	25	22
Social sciences	17	14	18	18	16	21	18	24	17	20	34	24	27
Engineering	51	44	48	49	36	45	29	52	47	55	47	53	58

NA = not available

NOTES: Data exclude scientists and engineers with doctorates from foreign institutions. All data are based on degree field. Those who are "active in R&D" reported a primary or secondary work responsibility for R&D. For 1981-87, counts are lower-bound estimates because a fraction of academic respondents was not asked about secondary work responsibility (13 percent in 1981, 7 percent in 1983, 13 percent in 1985, and fewer than 1 percent in 1987). Details may not add to totals because of rounding.

[a]Reported primary or secondary work responsibility for basic or applied research, development, or design.

[b]Full-time nonfaculty and all part-time.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Characteristics of Doctoral Scientists and Engineers in the United States: 1997,* Detailed Statistical Tables, in press (Arlington, VA: 1999).

See figure 6-19 in Volume 1.

Appendix table 6-29.
Academic doctoral scientists and engineers, by type of appointment and primary work responsibility: 1973–97
(Thousands)

Primary work responsibility	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
Total employment													
Total	118.0	134.1	145.4	155.3	167.1	176.1	190.2	195.9	206.6	210.6	213.8	217.5	232.5
Teaching	73.3	83.8	82.2	83.8	95.9	97.7	101.0	99.3	100.9	103.4	98.3	100.2	105.4
Research	27.8	30.8	37.0	41.3	46.5	48.9	55.9	66.5	72.2	73.9	80.2	83.0	88.6
Other	15.0	16.4	23.8	29.1	23.0	28.1	30.5	29.5	32.6	32.3	35.2	34.3	38.6
Full-time faculty													
Total	103.3	116.4	125.6	131.2	141.9	148.4	156.9	164.4	169.8	173.1	172.4	171.4	178.4
Teaching	69.9	80.2	78.4	79.7	92.1	91.9	94.9	93.6	93.9	96.7	91.4	91.9	95.4
Research	19.8	21.4	25.8	28.1	31.8	33.6	39.5	48.6	51.6	53.8	56.9	56.6	58.0
Other	12.0	12.2	19.6	22.6	16.7	21.8	20.3	21.8	23.4	22.4	24.1	22.9	24.9
Postdoctorates													
Total	4.2	6.2	7.6	8.1	8.5	8.3	8.7	9.3	11.5	9.9	13.3	16.8	18.9
Teaching	0.1	0.1	0.1	0.2	0.1	0.4	0.2	0.2	0.4	0.1	0.0	0.6	0.6
Research	3.8	5.7	6.8	6.9	7.7	7.1	7.5	8.4	10.3	9.2	12.7	15.1	16.7
Other	0.2	0.3	0.6	1.0	0.7	0.6	0.8	0.7	0.8	0.5	0.7	1.1	1.5
All others													
Total	10.5	11.5	12.2	16.0	16.6	19.4	24.6	22.1	25.4	27.6	28.0	29.3	35.3
Teaching	3.3	3.5	3.7	3.9	3.7	5.4	5.9	5.5	6.5	6.6	6.9	7.7	9.4
Research	4.1	3.8	4.4	6.3	6.9	8.1	8.9	9.6	10.3	11.0	10.7	11.4	13.8
Other	2.8	3.9	3.6	5.5	5.7	5.7	9.4	6.9	8.4	9.3	10.4	10.3	12.1

NOTES: Research is reported primary work responsibility for basic or applied research, development, or design; R&D management is excluded because it is unavailable for recent years. Full-time faculty includes full, associate, and assistant professors and instructors. Postdoctorates are self-designated as such. "All others" includes adjunct positions, research fellows, part-time faculty, and all other nonfaculty appointments. Details may not add to totals because of rounding and omission of those with unreported work responsibilities (1–2 percent through 1985, less than 1/2 percent through 1991, zero thereafter).

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Characteristics of Doctoral Scientists and Engineers in the United States: 1997*, Detailed Statistical Tables, in press (Arlington, VA: 1999).

See page 6-27 in Volume 1.

Appendix table 6-30.
Academic doctoral scientists and engineers, by type of appointment, degree field, and primary work responsibility: 1973–97
(Percentages)

Field	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
							Total employment						
Total S&E (thousands)	*118.0*	*134.1*	*145.4*	*155.3*	*167.1*	*176.1*	*190.2*	*195.9*	*206.6*	*210.6*	*213.8*	*217.5*	*232.5*
Teaching	63	64	57	54	58	56	54	51	49	49	46	46	45
Research	24	24	26	27	28	28	30	34	35	35	38	38	38
Other	13	13	17	19	14	16	16	15	16	15	16	16	17
Total sciences (thousands)	*105.6*	*120.6*	*130.7*	*139.5*	*150.9*	*157.9*	*170.3*	*174.7*	*183.8*	*187.8*	*190.6*	*193.7*	*205.9*
Teaching	62	64	57	54	57	56	53	51	48	49	46	45	45
Research	25	24	27	27	29	29	31	35	36	36	38	38	38
Other	13	12	16	19	14	16	16	15	16	16	17	16	17
Physical sciences (thousands)	*22.1*	*23.6*	*25.0*	*24.6*	*25.3*	*25.1*	*27.0*	*27.2*	*27.7*	*27.7*	*28.6*	*29.3*	*30.2*
Teaching	64	63	56	55	59	56	54	52	50	50	45	44	45
Research	27	28	32	31	32	31	35	38	39	39	42	43	42
Other	9	9	12	15	10	12	11	11	11	11	13	13	13
Mathematics (thousands)	*9.7*	*11.0*	*11.7*	*12.2*	*12.4*	*12.9*	*13.6*	*13.8*	*14.5*	*15.2*	*15.5*	*14.6*	*15.6*
Teaching	78	79	74	71	74	73	69	67	66	67	66	67	66
Research	16	13	16	17	16	15	20	23	24	23	22	22	23
Other	7	8	11	12	10	11	11	10	10	10	12	11	12
Computer sciences (thousands)	*NA*	*NA*	*NA*	*0.1*	*0.3*	*0.5*	*0.8*	*1.1*	*1.5*	*2.0*	*2.5*	*3.1*	*3.3*
Teaching	NA	NA	NA	68	60	54	42	30	39	38	55	57	53
Research	NA	NA	NA	30	39	39	47	62	52	54	35	33	32
Other	NA	NA	NA	3	1	7	11	8	10	8	10	10	15
Environmental sciences (thousands)	*3.4*	*3.9*	*4.2*	*4.2*	*4.6*	*4.8*	*5.2*	*5.6*	*5.9*	*6.0*	*6.4*	*6.4*	*7.3*
Teaching	69	70	65	59	62	59	57	52	51	50	45	47	44
Research	20	21	24	24	30	31	31	39	40	41	42	40	39
Other	11	9	11	17	8	11	11	9	8	9	13	12	17
Life sciences (thousands)	*34.9*	*39.4*	*42.6*	*47.0*	*51.3*	*54.8*	*58.7*	*61.2*	*64.8*	*66.9*	*68.2*	*71.6*	*77.3*
Teaching	48	50	43	39	40	39	36	33	32	31	30	30	30
Research	37	38	39	42	46	45	47	52	52	52	53	53	52
Other	14	13	17	19	14	16	17	16	16	17	18	17	17
Psychology (thousands)	*12.2*	*14.8*	*16.2*	*17.7*	*20.1*	*21.0*	*23.1*	*23.7*	*25.0*	*25.2*	*25.0*	*26.1*	*27.3*
Teaching	64	67	59	54	58	56	54	55	51	51	46	45	45
Research	17	15	17	20	20	21	20	22	24	25	27	28	29
Other	19	18	24	26	22	23	26	23	25	24	27	26	26
Social sciences (thousands)	*23.4*	*28.0*	*31.1*	*33.6*	*36.9*	*38.8*	*41.9*	*42.1*	*44.5*	*44.8*	*44.4*	*42.5*	*44.9*
Teaching	74	75	69	68	74	72	71	68	65	67	62	63	63
Research	12	12	14	12	12	13	14	18	18	19	24	23	22
Other	14	13	17	20	14	15	15	14	17	14	14	14	15
Engineering (thousands)	*12.4*	*13.4*	*14.8*	*15.8*	*16.1*	*18.1*	*19.9*	*21.2*	*22.8*	*22.8*	*23.1*	*23.8*	*26.6*
Teaching	69	67	60	58	63	60	59	53	54	54	50	51	48
Research	17	18	20	21	21	22	23	29	30	32	34	37	38
Other	14	15	20	21	17	19	18	17	16	15	16	13	14

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-30.
Academic doctoral scientists and engineers, by type of appointment, degree field, and primary work responsibility: 1973–97
(Percentages)

Field	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
							Full-time faculty						
Total S&E (thousands)	*103.3*	*116.4*	*125.6*	*131.2*	*141.9*	*148.4*	*156.9*	*164.4*	*169.8*	*173.1*	*172.4*	*171.4*	*178.4*
Teaching	69	71	63	61	65	62	61	57	56	56	53	54	53
Research	19	19	21	22	23	23	26	30	31	31	33	33	33
Other	12	11	16	17	12	15	13	13	14	13	14	13	14
Total sciences (thousands)	*92.0*	*104.2*	*112.2*	*116.9*	*127.2*	*132.0*	*139.0*	*145.1*	*149.5*	*153.1*	*152.3*	*151.3*	*156.8*
Teaching	68	70	63	61	65	62	61	57	55	56	53	53	53
Research	20	19	21	22	23	23	26	30	31	32	33	33	33
Other	12	10	15	17	12	14	13	13	14	13	14	14	14
Physical sciences (thousands)	*17.8*	*18.9*	*20.0*	*20.0*	*20.5*	*20.2*	*21.2*	*22.0*	*21.5*	*21.7*	*21.3*	*20.9*	*21.4*
Teaching	75	75	66	64	70	65	64	61	60	59	56	56	57
Research	17	18	22	22	23	23	27	30	30	31	33	33	32
Other	8	7	12	14	8	12	9	9	10	10	11	11	11
Mathematics (thousands)	*9.3*	*10.4*	*10.9*	*11.4*	*11.7*	*12.3*	*12.7*	*12.9*	*13.5*	*14.2*	*14.7*	*13.0*	*13.6*
Teaching	78	80	75	73	76	75	71	70	67	68	68	69	68
Research	16	13	15	16	15	15	20	21	24	23	21	21	21
Other	6	7	10	11	9	11	9	9	9	9	11	10	11
Computer sciences (thousands)	*NA*	*NA*	*NA*	*0.1*	*0.3*	*0.4*	*0.7*	*0.9*	*1.3*	*1.8*	*2.3*	*2.8*	*3.0*
Teaching	NA	NA	NA	92	66	63	49	35	39	38	58	61	56
Research	NA	NA	NA	5	34	33	41	60	52	55	32	31	33
Other	NA	NA	NA	3	0	5	10	5	9	7	9	9	11
Environmental sciences (thousands)	*3.0*	*3.4*	*3.6*	*3.5*	*3.8*	*4.0*	*4.2*	*4.4*	*4.7*	*4.5*	*4.5*	*4.7*	*5.1*
Teaching	75	78	73	68	73	67	69	63	60	63	56	60	58
Research	16	15	18	17	21	23	22	29	33	32	35	31	31
Other	9	7	9	15	5	10	9	8	7	5	9	9	11
Life sciences (thousands)	*29.5*	*33.1*	*34.9*	*37.3*	*40.9*	*43.5*	*45.6*	*48.1*	*49.3*	*51.1*	*50.8*	*52.8*	*55.2*
Teaching	54	56	50	46	48	46	44	39	38	37	36	38	38
Research	32	32	33	35	38	38	42	46	46	47	47	47	47
Other	13	12	17	19	13	16	15	15	16	16	16	16	16
Psychology (thousands)	*10.8*	*12.8*	*13.9*	*14.3*	*16.4*	*17.3*	*18.5*	*19.2*	*20.2*	*20.7*	*19.5*	*20.1*	*20.8*
Teaching	68	73	65	62	67	63	63	63	59	59	54	54	54
Research	15	12	15	15	15	17	18	20	23	24	27	27	28
Other	17	15	21	23	18	20	19	17	18	17	19	19	17
Social sciences (thousands)	*21.6*	*25.5*	*28.8*	*30.3*	*33.7*	*34.4*	*36.1*	*37.6*	*39.0*	*39.0*	*39.2*	*37.1*	*37.7*
Teaching	76	78	71	71	77	76	76	71	68	71	66	66	67
Research	12	11	13	11	11	11	13	17	18	18	23	22	20
Other	12	11	16	17	11	13	11	12	14	11	11	11	13
Engineering (thousands)	*11.3*	*12.2*	*13.5*	*14.3*	*14.7*	*16.4*	*17.9*	*19.3*	*20.2*	*20.1*	*20.2*	*20.0*	*21.5*
Teaching	73	73	64	63	68	64	64	57	58	59	55	57	56
Research	14	14	17	18	19	19	21	26	27	28	30	31	31
Other	13	13	19	19	13	18	15	17	15	13	15	11	13

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-30.
Academic doctoral scientists and engineers, by type of appointment, degree field, and primary work responsibility: 1973–97
(Percentages)

Field	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
						All others							
Total S&E (thousands)	*14.7*	*17.7*	*19.8*	*24.1*	*25.1*	*27.7*	*33.3*	*31.5*	*36.9*	*37.5*	*41.4*	*46.2*	*54.1*
Teaching	24	21	20	17	15	21	19	18	19	18	17	18	18
Research	56	55	58	56	59	56	50	57	56	55	56	57	56
Other	21	24	22	27	26	23	31	25	25	27	27	25	25
Total sciences (thousands)	*13.6*	*16.5*	*18.5*	*22.6*	*23.7*	*25.9*	*31.3*	*29.6*	*34.3*	*34.7*	*38.4*	*42.4*	*49.1*
Teaching	23	21	20	17	16	21	19	18	19	19	16	18	19
Research	56	55	59	56	60	56	51	57	56	54	56	57	55
Other	21	24	22	27	24	23	30	25	25	27	27	25	26
Physical sciences (thousands)	*4.2*	*4.6*	*4.9*	*4.7*	*4.8*	*5.0*	*5.8*	*5.2*	*6.2*	*6.0*	*7.4*	*8.5*	*8.8*
Teaching	17	16	14	13	13	20	15	13	14	16	13	15	14
Research	69	66	72	68	70	66	66	71	72	66	66	67	68
Other	14	18	14	18	17	14	19	16	14	18	20	18	18
Mathematics (thousands)	*0.4*	*0.6*	*0.8*	*0.8*	*0.7*	*0.6*	*0.8*	*0.9*	*0.9*	*1.0*	*0.8*	*1.6*	*1.9*
Teaching	61	49	52	38	48	51	38	32	49	49	40	51	47
Research	20	27	30	38	25	31	30	48	29	35	34	36	38
Other	19	24	18	24	27	18	32	20	22	16	25	13	15
Computer sciences (thousands)	*NA*	*NA*	*NA*	*0.0*	*0.0*	*0.1*	*0.1*	*0.2*	*0.2*	*0.1*	*0.2*	*0.3*	*0.4*
Teaching	NA	NA	NA	0	0	8	2	4	34	36	25	19	29
Research	NA	NA	NA	100	88	71	83	76	49	37	62	57	26
Other	NA	NA	NA	0	12	22	15	20	17	25	14	24	44
Environmental sciences (thousands)	*0.4*	*0.5*	*0.6*	*0.7*	*0.8*	*0.8*	*1.0*	*1.2*	*1.2*	*1.5*	*1.9*	*1.7*	*2.3*
Teaching	21	8	17	16	8	17	11	10	15	12	19	13	14
Research	53	69	65	58	70	68	67	74	70	69	58	66	58
Other	25	23	18	26	22	15	22	16	14	18	23	21	28
Life sciences (thousands)	*5.3*	*6.3*	*7.7*	*9.7*	*10.4*	*11.3*	*13.1*	*13.1*	*15.5*	*15.8*	*17.4*	*18.8*	*22.1*
Teaching	15	15	13	10	9	13	11	11	10	12	10	11	12
Research	66	68	69	68	74	70	66	70	72	68	68	69	67
Other	18	18	18	22	17	17	23	19	18	20	21	21	21
Psychology (thousands)	*1.4*	*1.9*	*2.3*	*3.4*	*3.7*	*3.7*	*4.6*	*4.5*	*4.8*	*4.4*	*5.5*	*6.1*	*6.5*
Teaching	32	25	24	20	18	20	16	20	19	14	20	16	17
Research	34	37	34	38	43	39	30	29	29	29	25	33	32
Other	35	38	42	42	39	41	54	50	52	58	55	51	51
Social sciences (thousands)	*1.8*	*2.5*	*2.3*	*3.3*	*3.2*	*4.4*	*5.8*	*4.5*	*5.5*	*5.8*	*5.2*	*5.4*	*7.2*
Teaching	47	42	41	39	38	41	41	44	42	40	33	43	42
Research	20	19	26	22	22	26	19	27	19	22	36	27	31
Other	32	39	34	39	40	33	40	29	39	37	31	30	27
Engineering (thousands)	*1.1*	*1.2*	*1.3*	*1.5*	*1.4*	*1.7*	*2.0*	*1.9*	*2.6*	*2.7*	*3.0*	*3.8*	*5.0*
Teaching	28	16	18	13	7	21	20	15	21	15	20	16	13
Research	49	51	54	52	43	50	36	62	57	62	61	65	67
Other	23	34	29	36	50	29	44	23	22	22	20	20	20

NA = not available

NOTES: Research is reported primary work responsibility for basic or applied research, development, or design. Full-time faculty includes full, associate, and assistant professors and instructors. "All others" includes postdoctorates, adjunct positions, research fellows, part-time faculty, and all other nonfaculty appointments. Italics indicate rounded numbers; all other numbers are percentages.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Characteristics of Doctoral Scientists and Engineers in the United States: 1997*, Detailed Statistical Tables, in press (Arlington, VA: 1999).

See page 6-28 in Volume 1.

Appendix table 6-31.
Academic doctoral scientists and engineers with recent Ph.D.s, by appointment type and primary work responsibility: 1973–97

	All types of appointments				Full-time faculty				All others			
	Total	Teaching	Research	Other	Total	Teaching	Research	Other	Total	Teaching	Research	Other
						Number (thousands)						
1973	25.0	15.1	7.8	1.8	18.4	14.2	2.9	1.0	6.6	0.9	4.9	0.8
1975	23.4	13.5	8.0	1.5	16.4	12.5	2.7	0.9	6.9	1.0	5.2	0.6
1977	22.5	11.7	8.5	2.1	14.6	10.7	2.7	1.0	7.9	1.0	5.8	1.0
1979	20.9	9.1	9.0	2.6	12.4	8.3	2.8	1.2	8.5	0.8	6.2	1.5
1981	20.7	9.3	9.3	2.0	11.8	8.7	2.2	0.8	8.9	0.5	7.1	1.2
1983	20.5	8.6	9.5	2.2	11.6	7.8	2.6	1.1	8.9	0.8	7.0	1.1
1985	21.8	8.6	10.4	2.4	11.9	7.6	3.2	0.9	9.9	1.1	7.2	1.5
1987	21.1	7.5	11.2	2.3	10.9	6.5	3.5	0.9	10.2	1.0	7.7	1.4
1989	23.3	7.5	13.5	2.3	11.1	6.2	4.2	0.7	12.2	1.3	9.3	1.6
1991	25.5	9.4	13.4	2.6	14.0	8.3	4.7	1.0	11.4	1.0	8.8	1.6
1993	25.1	8.4	14.0	2.7	12.0	7.1	4.2	0.7	13.2	1.3	9.9	2.0
1995	26.9	8.8	14.8	3.3	11.1	7.1	3.1	1.0	15.8	1.7	11.7	2.4
1997	29.0	10.1	15.4	3.5	11.8	8.0	2.7	1.0	17.2	2.1	12.6	2.5
						Percent						
1973	100	61	32	7	100	78	16	6	100	13	75	12
1975	100	59	35	6	100	78	17	5	100	14	77	9
1977	100	53	38	9	100	74	19	7	100	13	74	13
1979	100	44	43	13	100	68	23	10	100	9	74	17
1981	100	45	45	10	100	75	19	7	100	6	80	14
1983	100	42	47	11	100	68	22	10	100	9	79	12
1985	100	40	48	11	100	65	27	7	100	11	73	16
1987	100	36	53	11	100	60	32	8	100	10	76	14
1989	100	32	58	10	100	56	38	6	100	11	77	13
1991	100	37	53	10	100	60	33	7	100	9	77	14
1993	100	34	56	11	100	59	35	6	100	10	75	15
1995	100	33	55	12	100	64	28	9	100	11	74	15
1997	100	35	53	12	100	68	23	9	100	12	73	15

NOTES: Recent doctorates have earned their Ph.D.s in the three years preceding the survey year. Faculty positions include full, associate, and assistant professors and instructors.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Doctorate Recipients, special tabulations.

See figure 6-20 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 6-32.
Academic doctoral scientists and engineers reporting Federal support from one or more agencies, by field: 1973–97
(Numbers and Percentages)

	1973	1975	1977	1979	1981	1983	1985[a]	1987	1989	1991	1993[a]	1995[a]	1997[a]
Total science & engineering													
Number employed	*118,000*	*134,100*	*145,400*	*155,300*	*167,100*	*176,100*	*190,200*	*195,900*	*206,600*	*210,600*	*213,800*	*217,500*	*232,500*
Active in research	71	69	59	58	61	60	61	74	74	75	70	71	71
Research is primary	24	24	26	27	28	28	30	34	35	35	38	38	38
Federal support	46	42	41	39	42	44	37	48	49	50	37	39	39
from 1 agency	80	80	81	82	81	80	82	74	74	70	75	73	78
from 2 agencies	17	16	15	15	16	17	16	20	20	23	20	21	18
from 3+ agencies	4	4	3	3	3	3	3	6	6	7	5	5	4
Total sciences													
Number employed	*105,600*	*120,600*	*130,700*	*139,500*	*150,900*	*157,900*	*170,300*	*174,700*	*183,800*	*187,800*	*190,600*	*193,700*	*205,900*
Active in research	70	70	59	58	61	60	61	73	73	74	70	70	70
Research is primary	25	24	27	27	29	29	31	35	36	36	38	38	38
Federal support	45	41	40	38	41	43	36	47	48	49	36	38	37
from 1 agency	81	81	82	83	82	81	82	75	75	72	76	75	79
from 2 agencies	16	16	15	14	15	17	15	20	19	22	19	20	17
from 3+ agencies	3	3	3	2	3	3	3	5	5	6	5	5	4
Physical sciences													
Number employed	*22,100*	*23,600*	*25,000*	*24,600*	*25,300*	*25,100*	*27,000*	*27,200*	*27,700*	*27,700*	*28,600*	*29,300*	*30,200*
Active in research	75	73	66	63	65	65	66	75	75	75	70	70	72
Research is primary	27	28	32	31	32	31	35	38	39	39	42	43	42
Federal support	49	45	46	44	50	51	43	54	58	56	46	48	46
from 1 agency	77	75	77	77	76	74	78	68	69	63	68	66	69
from 2 agencies	20	21	19	20	17	23	18	24	24	30	26	28	26
from 3+ agencies	3	4	4	3	7	3	3	8	7	7	6	7	5
Mathematics													
Number employed	*9,700*	*11,000*	*11,700*	*12,200*	*12,400*	*12,900*	*13,600*	*13,800*	*14,500*	*15,200*	*15,500*	*14,600*	*15,600*
Active in research	71	69	59	57	55	57	57	71	71	71	61	64	65
Research is primary	16	13	16	17	16	15	20	23	24	23	22	22	23
Federal support	29	19	19	21	21	30	21	31	33	34	19	22	21
from 1 agency	90	89	88	86	83	89	84	78	74	75	80	75	81
from 2 agencies	8	10	11	14	15	9	15	19	22	19	16	21	15
from 3+ agencies	2	1	1	0	2	2	1	3	4	6	4	3	4
Computer sciences													
Number employed	*NA*	*NA*	*NA*	*100*	*300*	*500*	*800*	*1,100*	*1,500*	*2,000*	*2,500*	*3,100*	*3,300*
Active in research	NA	NA	NA	86	97	74	76	90	89	86	79	76	73
Research is primary	NA	NA	NA	30	39	39	47	62	52	54	35	33	32
Federal support	NA	NA	NA	35	30	45	45	62	52	49	40	43	41
from 1 agency	NA	NA	NA	100	86	72	78	65	63	58	58	63	70
from 2 agencies	NA	NA	NA	0	14	28	22	30	34	38	37	33	26
from 3+ agencies	NA	NA	NA	0	0	0	0	5	3	3	5	5	4

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-32.
Academic doctoral scientists and engineers reporting Federal support from one or more agencies, by field: 1973–97
(Numbers and Percentages)

	1973	1975	1977	1979	1981	1983	1985[a]	1987	1989	1991	1993[a]	1995[a]	1997[a]
Environmental sciences													
Number employed	*3,400*	*3,900*	*4,200*	*4,200*	*4,600*	*4,800*	*5,200*	*5,600*	*5,900*	*6,000*	*6,400*	*6,400*	*7,300*
Active in research	73	74	70	65	70	68	72	84	84	84	78	80	77
Research is primary	20	21	24	24	30	31	31	39	40	41	42	40	39
Federal support	47	46	43	45	49	54	51	60	63	65	51	54	58
from 1 agency	63	65	65	73	63	58	62	55	54	48	55	54	67
from 2 agencies	29	27	24	19	26	30	27	29	32	33	29	35	22
from 3+ agencies	7	8	10	9	11	12	11	16	14	19	16	11	11
Life sciences													
Number employed	*34,900*	*39,400*	*42,600*	*47,000*	*51,300*	*54,800*	*58,700*	*61,200*	*64,800*	*66,900*	*68,200*	*71,600*	*77,300*
Active in research	76	76	68	69	73	71	72	80	80	80	76	75	75
Research is primary	37	38	39	42	46	45	47	52	52	52	53	53	52
Federal support	60	59	57	55	59	59	53	65	65	65	52	52	51
from 1 agency	82	83	84	85	84	82	84	76	76	74	81	79	82
from 2 agencies	15	15	14	13	14	16	14	19	18	20	16	17	15
from 3+ agencies	3	3	3	2	2	2	2	5	5	6	4	5	3
Psychology													
Number employed	*12,200*	*14,800*	*16,200*	*17,700*	*20,100*	*21,000*	*23,100*	*23,700*	*25,000*	*25,200*	*25,000*	*26,100*	*27,300*
Active in research	61	58	48	47	50	50	47	60	58	63	60	60	59
Research is primary	17	15	17	20	20	21	20	22	24	25	27	28	29
Federal support	39	36	33	32	32	30	25	31	35	35	26	27	27
from 1 agency	85	84	86	86	81	84	84	84	81	80	81	85	84
from 2 agencies	13	13	12	12	17	15	15	14	15	15	16	13	15
from 3+ agencies	2	3	2	2	2	2	1	3	4	5	3	2	10
Social sciences													
Number employed	*23,400*	*28,000*	*31,100*	*33,600*	*36,900*	*38,800*	*41,900*	*42,100*	*44,500*	*44,800*	*44,400*	*42,500*	*44,900*
Active in research	62	62	46	44	48	46	51	68	69	70	66	66	66
Research is primary	12	12	14	12	12	13	14	18	18	19	24	23	22
Federal support	26	24	23	20	21	24	17	27	28	28	14	16	15
from 1 agency	84	86	87	88	86	89	89	79	84	73	76	81	82
from 2 agencies	11	12	12	11	14	9	8	16	13	22	21	17	15
from 3+ agencies	4	3	1	1	0	2	2	4	3	5	3	2	3
Engineering													
Number employed	*12,400*	*13,400*	*14,800*	*15,800*	*16,100*	*18,100*	*19,900*	*21,200*	*22,800*	*22,800*	*23,100*	*23,800*	*26,600*
Active in research	74	69	61	62	59	62	64	79	77	80	76	78	79
Research is primary	17	18	20	21	21	22	23	29	30	32	34	37	38
Federal support	55	50	51	49	50	55	42	57	56	63	43	50	50
from 1 agency	70	71	74	72	75	72	76	66	63	60	64	61	72
from 2 agencies	24	22	20	23	19	20	19	24	24	28	28	30	22
from 3+ agencies	6	7	6	5	6	8	5	9	13	13	8	9	6

NA = not available

[a]Data are not comparable to other years that had reference periods of a total academic year: 1985 survey had a one-month reference period; 1993 through 1997 surveys employed a week-long reference.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Doctorate Recipients, special tabulations.

See page 6-28 in Volume 1.

Appendix table 6-33.
Full-time S&E graduate students, by source and mechanism of primary support: 1980–97

	All mechanisms	Research assistantships	Fellowships	Traineeships	Teaching assistantships	Other	Self-support
Total number of students							
1980	238,448	51,567	20,516	17,550	53,890	19,446	75,479
1981	242,076	52,719	20,104	16,774	55,745	20,206	76,528
1982	244,796	52,580	20,865	14,640	58,334	20,455	77,922
1983	252,055	54,904	21,351	13,514	60,071	20,955	81,260
1984	253,922	57,735	21,624	13,465	61,256	20,692	79,150
1985	257,287	60,995	22,540	13,665	61,822	20,635	77,630
1986	266,182	66,010	22,954	13,526	62,561	22,246	78,885
1987	271,066	70,214	21,953	14,096	62,857	22,166	79,780
1988	275,194	74,588	22,353	14,397	63,069	21,584	79,203
1989	282,719	79,059	23,461	14,527	64,309	21,082	80,281
1990	292,830	80,746	25,254	15,212	64,965	22,265	84,388
1991	307,040	85,175	26,695	15,417	65,229	22,955	91,569
1992	322,609	88,030	28,630	15,375	65,725	23,558	101,291
1993	329,679	90,156	29,132	15,458	67,315	21,360	106,258
1994	332,129	92,011	28,894	15,692	66,869	21,650	107,013
1995	329,148	89,950	28,891	15,953	65,997	21,868	106,489
1996	328,453	87,695	28,863	15,488	65,789	21,278	109,340
1997	326,842	88,045	28,890	14,479	65,199	21,849	108,380
Number with primary support from Federal sources							
1980	52,963	29,316	4,629	13,306	662	5,050	NA
1981	50,901	29,146	4,093	12,175	619	4,868	NA
1982	47,407	28,313	4,093	10,077	428	4,496	NA
1983	47,755	29,152	4,109	9,114	498	4,882	NA
1984	47,784	29,463	4,116	8,970	400	4,835	NA
1985	49,051	30,433	4,416	8,954	549	4,699	NA
1986	51,361	32,739	4,596	8,688	495	4,843	NA
1987	53,538	34,996	4,445	8,922	444	4,731	NA
1988	55,489	36,752	4,566	8,664	504	5,003	NA
1989	57,442	38,555	5,175	8,682	490	4,540	NA
1990	59,272	38,504	6,314	9,242	609	4,603	NA
1991	63,014	40,790	7,445	9,630	476	4,673	NA
1992	65,626	42,586	7,757	10,054	643	4,586	NA
1993	67,688	44,502	7,510	10,187	846	4,643	NA
1994	68,566	45,621	6,941	10,418	780	4,806	NA
1995	67,310	44,597	6,918	10,244	739	4,812	NA
1996	65,252	43,371	7,045	9,876	843	4,117	NA
1997	64,340	43,187	7,053	9,297	896	3,907	NA
Number with primary support from non-Federal sources							
1980	110,006	22,251	15,887	4,244	53,228	14,396	NA
1981	114,647	23,573	16,011	4,599	55,126	15,338	NA
1982	119,467	24,267	16,772	4,563	57,906	15,959	NA
1983	123,040	25,752	17,242	4,400	59,573	16,073	NA
1984	126,988	28,272	17,508	4,495	60,856	15,857	NA
1985	130,606	30,562	18,124	4,711	61,273	15,936	NA
1986	135,936	33,271	18,358	4,838	62,066	17,403	NA
1987	137,748	35,218	17,508	5,174	62,413	17,435	NA
1988	140,502	37,836	17,787	5,733	62,565	16,581	NA
1989	144,996	40,504	18,286	5,845	63,819	16,542	NA
1990	149,170	42,242	18,940	5,970	64,356	17,662	NA
1991	152,457	44,385	19,250	5,787	64,753	18,282	NA
1992	155,692	45,444	20,873	5,321	65,082	18,972	NA
1993	155,733	45,654	21,622	5,271	66,469	16,717	NA
1994	156,550	46,390	21,953	5,274	66,089	16,844	NA
1995	155,349	45,353	21,973	5,709	65,258	17,056	NA
1996	153,861	44,324	21,818	5,612	64,946	17,161	NA
1997	154,122	44,858	21,837	5,182	64,303	17,942	NA

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-33.
Full-time S&E graduate students, by source and mechanism of primary support: 1980–97

	All mechanisms	Research assistantships	Fellowships	Traineeships	Teaching assistantships	Other	Self-support
Percentage of all students							
1980	100.0	21.6	8.6	7.4	22.6	8.2	31.7
1981	100.0	21.8	8.3	6.9	23.0	8.3	31.6
1982	100.0	21.5	8.5	6.0	23.8	8.4	31.8
1983	100.0	21.8	8.5	5.4	23.8	8.3	32.2
1984	100.0	22.7	8.5	5.3	24.1	8.1	31.2
1985	100.0	23.7	8.8	5.3	24.0	8.0	30.2
1986	100.0	24.8	8.6	5.1	23.5	8.4	29.6
1987	100.0	25.9	8.1	5.2	23.2	8.2	29.4
1988	100.0	27.1	8.1	5.2	22.9	7.8	28.8
1989	100.0	28.0	8.3	5.1	22.7	7.5	28.4
1990	100.0	27.6	8.6	5.2	22.2	7.6	28.8
1991	100.0	27.7	8.7	5.0	21.2	7.5	29.8
1992	100.0	27.3	8.9	4.8	20.4	7.3	31.4
1993	100.0	27.3	8.8	4.7	20.4	6.5	32.2
1994	100.0	27.7	8.7	4.7	20.1	6.5	32.2
1995	100.0	27.3	8.8	4.8	20.1	6.6	32.4
1996	100.0	26.7	8.8	4.7	20.0	6.5	33.3
1997	100.0	26.9	8.8	4.4	19.9	6.7	33.2
Percentage of federally supported students							
1980	100.0	55.4	8.7	25.1	1.2	9.5	NA
1981	100.0	57.3	8.0	23.9	1.2	9.6	NA
1982	100.0	59.7	8.6	21.3	0.9	9.5	NA
1983	100.0	61.0	8.6	19.1	1.0	10.2	NA
1984	100.0	61.7	8.6	18.8	0.8	10.1	NA
1985	100.0	62.0	9.0	18.3	1.1	9.6	NA
1986	100.0	63.7	8.9	16.9	1.0	9.4	NA
1987	100.0	65.4	8.3	16.7	0.8	8.8	NA
1988	100.0	66.2	8.2	15.6	0.9	9.0	NA
1989	100.0	67.1	9.0	15.1	0.9	7.9	NA
1990	100.0	65.0	10.7	15.6	1.0	7.8	NA
1991	100.0	64.7	11.8	15.3	0.8	7.4	NA
1992	100.0	64.9	11.8	15.3	1.0	7.0	NA
1993	100.0	65.7	11.1	15.0	1.2	6.9	NA
1994	100.0	66.5	10.1	15.2	1.1	7.0	NA
1995	100.0	66.3	10.3	15.2	1.1	7.1	NA
1996	100.0	66.5	10.8	15.1	1.3	6.3	NA
1997	100.0	67.1	11.0	14.4	1.4	6.1	NA
Percentage of non-federally supported students							
1980	100.0	20.2	14.4	3.9	48.4	13.1	NA
1981	100.0	20.6	14.0	4.0	48.1	13.4	NA
1982	100.0	20.3	14.0	3.8	48.5	13.4	NA
1983	100.0	20.9	14.0	3.6	48.4	13.1	NA
1984	100.0	22.3	13.8	3.5	47.9	12.5	NA
1985	100.0	23.4	13.9	3.6	46.9	12.2	NA
1986	100.0	24.5	13.5	3.6	45.7	12.8	NA
1987	100.0	25.6	12.7	3.8	45.3	12.7	NA
1988	100.0	26.9	12.7	4.1	44.5	11.8	NA
1989	100.0	27.9	12.6	4.0	44.0	11.4	NA
1990	100.0	28.3	12.7	4.0	43.1	11.8	NA
1991	100.0	29.1	12.6	3.8	42.5	12.0	NA
1992	100.0	29.2	13.4	3.4	41.8	12.2	NA
1993	100.0	29.3	13.9	3.4	42.7	10.7	NA
1994	100.0	29.6	14.0	3.4	42.2	10.8	NA
1995	100.0	29.2	14.1	3.7	42.0	11.0	NA
1996	100.0	28.8	14.2	3.6	42.2	11.2	NA
1997	100.0	29.1	14.2	3.4	41.7	11.6	NA

NA = not available

NOTE: Science and engineering includes the health fields (medical sciences and other life sciences).

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Graduate Students and Postdoctorates in Science and Engineering, various years, special tabulations.

See figures 6-21 and 6-23 in Volume 1.

Appendix table 6-34.
Full-time S&E graduate students, by institution type, and source and mechanism of primary support: 1997

Institution type & support mechanism	Source of support			
	Total	Federal	Non-Federal	Self
Number of full-time S&E graduate students				
Private, all mechanisms	96,461	18,766	37,939	39,756
Fellowship	12,672	2,658	10,014	NA
Traineeship	6,817	3,714	3,103	NA
Research assistantship	19,087	11,466	7,621	NA
Teaching assistantship	11,956	204	11,752	NA
Other	45,929	724	5,449	39,756
Public, all mechanisms	230,381	45,574	116,183	68,624
Fellowship	16,218	4,395	11,823	NA
Traineeship	7,662	5,583	2,079	NA
Research assistantship	68,958	31,721	37,237	NA
Teaching assistantship	53,243	692	52,551	NA
Other	84,300	3,183	12,493	68,624
Percent of full-time S&E graduate students				
Private, all mechanisms	100.0	100.0	100.0	100.0
Fellowship	13.1	14.2	26.4	NA
Traineeship	7.1	19.8	8.2	NA
Research assistantship	19.8	61.1	20.1	NA
Teaching assistantship	12.4	1.1	31.0	NA
Other	47.6	3.9	14.4	100.0
Public, all mechanisms	100.0	100.0	100.0	100.0
Fellowship	7.0	9.6	10.2	NA
Traineeship	3.3	12.3	1.8	NA
Research assistantship	29.9	69.6	32.1	NA
Teaching assistantship	23.1	1.5	45.2	NA
Other	36.6	7.0	10.8	100.0
Percent of full-time S&E graduate students				
Private, all mechanisms	100.0	19.5	39.3	41.2
Fellowship	100.0	21.0	79.0	NA
Traineeship	100.0	54.5	45.5	NA
Research assistantship	100.0	60.1	39.9	NA
Teaching assistantship	100.0	1.7	98.3	NA
Other	100.0	1.6	11.9	86.6
Public, all mechanisms	100.0	19.8	50.4	29.8
Fellowship	100.0	27.1	72.9	NA
Traineeship	100.0	72.9	27.1	NA
Research assistantship	100.0	46.0	54.0	NA
Teaching assistantship	100.0	1.3	98.7	NA
Other	100.0	3.8	14.8	81.4

NA = not applicable

NOTES: Science and engineering includes the health fields (medical sciences and other life sciences).

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Graduate Students and Postdoctorates in Science and Engineering, special tabulations, 1997.

See figure 6-22 in Volume 1.

Appendix table 6-35.
Primary mechanisms of support for 1997 S&E Ph.D. recipients, by degree field

Field	All mechanisms	Research assistantships	Fellowships	Traineeships	Teaching assistantships	Other	Self-support	Unknown
				Number				
TOTAL S&E	28,241	9,647	674	2,045	4,228	2,438	5,788	3,421
Total sciences	22,189	6,829	502	1,721	3,716	1,704	4,892	2,825
Physical sciences	3,711	1,778	96	183	766	181	276	431
Astronomy	197	96	15	17	32	17	8	12
Chemistry	2,115	967	34	104	489	73	187	261
Physics	1,379	707	46	62	244	90	77	153
Other	20	8	1	0	1	1	4	5
Mathematics	1,112	119	19	75	593	48	133	125
Computer sciences	889	332	24	38	119	112	161	103
Environmental sciences	862	359	39	44	107	97	117	99
Atmospheric sciences	147	92	6	7	4	16	13	9
Earth sciences	482	173	20	25	92	44	73	55
Oceanography	141	70	8	8	2	22	10	21
Other	92	24	5	4	9	15	21	14
Life sciences	8,077	3,377	205	685	822	665	1,370	953
Agricultural sciences	966	413	17	43	47	142	173	131
Biological sciences	5,717	2,674	156	579	656	378	660	614
Medical sciences	547	169	13	34	58	49	150	74
Other	847	121	19	29	61	96	387	134
Psychology	3,489	407	36	223	435	218	1,535	635
Social sciences	4,049	457	83	473	874	383	1,300	479
Anthropology	464	25	25	70	82	39	156	67
Economics	1,146	160	9	127	306	129	268	147
History of science	34	3	0	5	7	2	13	4
Linguistics	243	17	7	27	70	24	78	20
Political science	961	80	23	127	176	90	354	111
Sociology	595	90	9	63	122	45	212	54
Other	606	82	10	54	111	54	219	76
Total engineering	6,052	2,818	172	324	512	734	896	596
Aeronautical/astronautical	272	129	13	13	15	53	33	16
Chemical	764	426	12	60	67	73	54	72
Civil	653	293	19	29	51	69	132	60
Electrical/electronics	1,695	738	48	74	159	211	296	169
Industrial	241	63	1	7	28	28	79	35
Mechanical	1,010	490	37	54	95	110	142	82
Materials	573	345	21	30	27	65	44	41
Other	844	334	21	57	70	125	116	121

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-35.
Primary mechanisms of support for 1997 S&E Ph.D. recipients, by degree field

Field	All mechanisms	Research assistantships	Fellowships	Traineeships	Teaching assistantships	Other	Self-support	Unknown
				Percent				
TOTAL S&E	100.0	34.2	2.4	7.2	15.0	8.6	20.5	12.1
Total sciences	100.0	30.8	2.3	7.8	16.7	7.7	22.0	12.7
Physical sciences	100.0	47.9	2.6	4.9	20.6	4.9	7.4	11.6
Astronomy	100.0	48.7	7.6	8.6	16.2	8.6	4.1	6.1
Chemistry	100.0	45.7	1.6	4.9	23.1	3.5	8.8	12.3
Physics	100.0	51.3	3.3	4.5	17.7	6.5	5.6	11.1
Other	100.0	40.0	5.0	0.0	5.0	5.0	20.0	25.0
Mathematics	100.0	10.7	1.7	6.7	53.3	4.3	12.0	11.2
Computer sciences	100.0	37.3	2.7	4.3	13.4	12.6	18.1	11.6
Environmental sciences	100.0	41.6	4.5	5.1	12.4	11.3	13.6	11.5
Atmospheric sciences	100.0	62.6	4.1	4.8	2.7	10.9	8.8	6.1
Earth sciences	100.0	35.9	4.1	5.2	19.1	9.1	15.1	11.4
Oceanography	100.0	49.6	5.7	5.7	1.4	15.6	7.1	14.9
Other	100.0	26.1	5.4	4.3	9.8	16.3	22.8	15.2
Life sciences	100.0	41.8	2.5	8.5	10.2	8.2	17.0	11.8
Agricultural sciences	100.0	42.8	1.8	4.5	4.9	14.7	17.9	13.6
Biological sciences	100.0	46.8	2.7	10.1	11.5	6.6	11.5	10.7
Medical sciences	100.0	30.9	2.4	6.2	10.6	9.0	27.4	13.5
Other	100.0	14.3	2.2	3.4	7.2	11.3	45.7	15.8
Psychology	100.0	11.7	1.0	6.4	12.5	6.2	44.0	18.2
Social sciences	100.0	11.3	2.0	11.7	21.6	9.5	32.1	11.8
Anthropology	100.0	5.4	5.4	15.1	17.7	8.4	33.6	14.4
Economics	100.0	14.0	0.8	11.1	26.7	11.3	23.4	12.8
History of science	100.0	8.8	0.0	14.7	20.6	5.9	38.2	11.8
Linguistics	100.0	7.0	2.9	11.1	28.8	9.9	32.1	8.2
Political science	100.0	8.3	2.4	13.2	18.3	9.4	36.8	11.6
Sociology	100.0	15.1	1.5	10.6	20.5	7.6	35.6	9.1
Other	100.0	13.5	1.7	8.9	18.3	8.9	36.1	12.5
Total engineering	100.0	46.6	2.8	5.4	8.5	12.1	14.8	9.8
Aeronautical/astronautical	100.0	47.4	4.8	4.8	5.5	19.5	12.1	5.9
Chemical	100.0	55.8	1.6	7.9	8.8	9.6	7.1	9.4
Civil	100.0	44.9	2.9	4.4	7.8	10.6	20.2	9.2
Electrical/electronics	100.0	43.5	2.8	4.4	9.4	12.4	17.5	10.0
Industrial	100.0	26.1	0.4	2.9	11.6	11.6	32.8	14.5
Mechanical	100.0	48.5	3.7	5.3	9.4	10.9	14.1	8.1
Materials	100.0	60.2	3.7	5.2	4.7	11.3	7.7	7.2
Other	100.0	39.6	2.5	6.8	8.3	14.8	13.7	14.3

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Earned Doctorates, 1997, special tabulations.

See figure 6-26 in Volume 1.

Appendix table 6-36.
Full-time S&E graduate students, by field and mechanism of primary support: 1997

Field	All mechanisms	Research assistantships	Fellowships	Traineeships	Teaching assistantships	Other	Self-support
				Total number of students			
TOTAL SCIENCE & ENGINEERING	326,842	88,045	28,890	14,479	65,199	21,849	108,380
Total science	261,248	61,171	23,134	13,615	55,047	16,846	91,435
Physical sciences	26,892	11,321	2,197	531	10,819	596	1,428
Astronomy	768	355	143	17	215	9	29
Chemistry	16,019	6,464	1,168	371	6,962	310	744
Physics	9,923	4,442	875	143	3,619	269	575
Other	182	60	11	0	23	8	80
Mathematics	12,153	1,407	1,198	179	6,700	639	2,030
Computer sciences	18,320	4,035	942	224	3,639	1,417	8,063
Environmental sciences	10,550	4,275	820	92	2,643	561	2,159
Atmospheric sciences	966	630	55	4	117	78	82
Earth sciences	5,432	1,928	479	43	1,952	222	808
Oceanography	1,971	1,144	172	18	222	132	283
Other	2,181	573	114	27	352	129	986
Life sciences	102,338	28,574	8,385	9,993	13,196	6,379	35,811
Agricultural sciences	9,110	5,088	470	129	961	372	2,090
Biological sciences	46,998	18,648	5,481	5,052	9,088	1,934	6,795
Medical sciences	14,453	2,992	1,421	1,432	1,354	1,164	6,090
Other	31,777	1,846	1,013	3,380	1,793	2,909	20,836
Psychology	35,522	4,839	2,107	1,063	6,148	3,274	18,091
Social sciences	55,473	6,720	7,485	1,533	11,902	3,980	23,853
Anthropology	5,797	470	1,229	97	1,307	380	2,314
Economics	10,510	1,869	1,524	250	2,822	682	3,363
History of science	377	15	119	22	108	16	97
Linguistics	2,360	203	368	37	679	252	821
Political science	17,053	1,380	2,425	730	2,797	1,157	8,564
Sociology	7,393	988	898	237	2,285	377	2,608
Other	11,983	1,795	922	160	1,904	1,116	6,086
Total engineering	65,594	26,874	5,756	864	10,152	5,003	16,945
Aeronautical/astronautical	2,529	1,225	251	17	280	334	422
Chemical	5,784	2,969	831	94	922	189	779
Civil	11,259	3,971	849	180	1,763	813	3,683
Electrical/electronics	18,926	7,486	1,390	122	3,345	1,573	5,010
Industrial	5,071	1,264	239	17	773	508	2,270
Mechanical	10,432	4,355	835	215	1,903	694	2,430
Materials	3,661	2,376	303	33	370	148	431
Other	7,932	3,228	1,058	186	796	744	1,920

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-36.
Full-time S&E graduate students, by field and mechanism of primary support: 1997

Field	All mechanisms	Research assistantships	Fellowships	Teaching Traineeships	assistantships	Other	Self-support
			Percent of students				
TOTAL SCIENCE & ENGINEERING	100.0	26.9	8.8	4.4	19.9	6.7	33.2
Total science	100.0	23.4	8.9	5.2	21.1	6.4	35.0
Physical sciences	100.0	42.1	8.2	2.0	40.2	2.2	5.3
Astronomy	100.0	46.2	18.6	2.2	28.0	1.2	3.8
Chemistry	100.0	40.4	7.3	2.3	43.5	1.9	4.6
Physics	100.0	44.8	8.8	1.4	36.5	2.7	5.8
Other	100.0	33.0	6.0	0.0	12.6	4.4	44.0
Mathematics	100.0	11.6	9.9	1.5	55.1	5.3	16.7
Computer sciences	100.0	22.0	5.1	1.2	19.9	7.7	44.0
Environmental sciences	100.0	40.5	7.8	0.9	25.1	5.3	20.5
Atmospheric sciences	100.0	65.2	5.7	0.4	12.1	8.1	8.5
Earth sciences	100.0	35.5	8.8	0.8	35.9	4.1	14.9
Oceanography	100.0	58.0	8.7	0.9	11.3	6.7	14.4
Other	100.0	26.3	5.2	1.2	16.1	5.9	45.2
Life sciences	100.0	27.9	8.2	9.8	12.9	6.2	35.0
Agricultural sciences	100.0	55.9	5.2	1.4	10.5	4.1	22.9
Biological sciences	100.0	39.7	11.7	10.7	19.3	4.1	14.5
Medical sciences	100.0	20.7	9.8	9.9	9.4	8.1	42.1
Other	100.0	5.8	3.2	10.6	5.6	9.2	65.6
Psychology	100.0	13.6	5.9	3.0	17.3	9.2	50.9
Social sciences	100.0	12.1	13.5	2.8	21.5	7.2	43.0
Anthropology	100.0	8.1	21.2	1.7	22.5	6.6	39.9
Economics	100.0	17.8	14.5	2.4	26.9	6.5	32.0
History of science	100.0	4.0	31.6	5.8	28.6	4.2	25.7
Linguistics	100.0	8.6	15.6	1.6	28.8	10.7	34.8
Political science	100.0	8.1	14.2	4.3	16.4	6.8	50.2
Sociology	100.0	13.4	12.1	3.2	30.9	5.1	35.3
Other	100.0	15.0	7.7	1.3	15.9	9.3	50.8
Total engineering	100.0	41.0	8.8	1.3	15.5	7.6	25.8
Aeronautical/astronautical	100.0	48.4	9.9	0.7	11.1	13.2	16.7
Chemical	100.0	51.3	14.4	1.6	15.9	3.3	13.5
Civil	100.0	35.3	7.5	1.6	15.7	7.2	32.7
Electrical/electronics	100.0	39.6	7.3	0.6	17.7	8.3	26.5
Industrial	100.0	24.9	4.7	0.3	15.2	10.0	44.8
Mechanical	100.0	41.7	8.0	2.1	18.2	6.7	23.3
Materials	100.0	64.9	8.3	0.9	10.1	4.0	11.8
Other	100.0	40.7	13.3	2.3	10.0	9.4	24.2

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Graduate Students and Postdoctorates in Science and Engineering, 1997, special tabulations.

See figure 6-26 in Volume 1.

Appendix table 6-37.
Primary mechanisms of support for 1997 S&E Ph.D. recipients, by citizenship, sex, and race/ethnicity

Citizenship, sex, and race/ethnicity	All mechanisms	Research assistantships	Fellowships	Traineeships	Teaching assistantships	Other	Self-support	Unknown
				Number				
Citizenship								
Non-U.S. citizen–temporary resident	7,200	3,190	97	384	1,406	854	815	454
Non-U.S. citizen–permanent resident	2,330	1,057	21	178	437	117	354	166
U.S. citizen, includes naturalized citizens	16,686	5,253	547	1,457	2,309	1,388	4,530	1,202
Unknown	2,025	147	9	26	76	79	89	1,599
Sex (U.S. citizens only)								
Men	9,948	3,448	344	787	1,451	897	2,291	730
Women	6,738	1,805	203	670	858	491	2,239	472
Race/ethnicity (U.S. citizens only)								
Underrepresented minority	1,238	257	79	192	104	164	319	123
Asian/Pacific Islander	1,043	428	42	98	101	71	175	128
White	13,902	4,449	407	1,138	2,050	1,125	3,932	801
Unknown	503	119	19	29	54	28	104	150
				Percent				
Citizenship								
Non-U.S. citizen–temporary resident	100.0	44.3	1.3	5.3	19.5	11.9	11.3	6.3
Non-U.S. citizen–permanent resident	100.0	45.4	0.9	7.6	18.8	5.0	15.2	7.1
U.S. citizen, includes naturalized citizens	100.0	31.5	3.3	8.7	13.8	8.3	27.1	7.2
Unknown	100.0	7.3	0.4	1.3	3.8	3.9	4.4	79.0
Sex (U.S. citizens only)								
Men	100.0	34.7	3.5	7.9	14.6	9.0	23.0	7.3
Women	100.0	26.8	3.0	9.9	12.7	7.3	33.2	7.0
Race/ethnicity (U.S. citizens only)								
Underrepresented minority	100.0	20.8	6.4	15.5	8.4	13.2	25.8	9.9
Asian/Pacific Islander	100.0	41.0	4.0	9.4	9.7	6.8	16.8	12.3
White	100.0	32.0	2.9	8.2	14.7	8.1	28.3	5.8
Unknown	100.0	23.7	3.8	5.8	10.7	5.6	20.7	29.8

NOTES: Underrepresented minorities include American Indian/Alaskan Native, black, and Hispanic respondents. Science and engineering includes the health fields (medical and other life sciences).

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Earned Doctorates, special tabulations (1997).

See figure 6-24 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 6-38.
Primary mechanisms of support for 1997 S&E Ph.D. recipients, by degree field and citizenship status

Field	Citizenship status	All mechanisms	Research assistantships	Fellowships	Traineeships	Teaching assistantships	Other	Self-support	Unknown
		Number							
TOTAL SCIENCE & ENGINEERING	Non-U.S. citizen–temporary resident	7,200	3,190	97	384	1,406	854	815	454
	Non-U.S. citizen–permanent resident	2,330	1,057	21	178	437	117	354	166
	U.S. citizen, incl. naturalized citizens	16,686	5,253	547	1,457	2,309	1,388	4,530	1,202
Total science	Non-U.S. citizen–temporary resident	4,804	1,849	76	326	1,142	589	493	329
	Non-U.S. citizen–permanent resident	1,737	722	12	153	375	76	270	129
	U.S. citizen, incl. naturalized citizens	13,998	4,164	407	1,218	2,139	984	4,069	1,017
Physical sciences	Non-U.S. citizen–temporary resident	1,015	544	10	32	285	48	36	60
	Non-U.S. citizen–permanent resident	361	175	2	13	108	9	19	35
	U.S. citizen, incl. naturalized citizens	2,112	1,033	84	137	361	122	220	155
Mathematics	Non-U.S. citizen–temporary resident	416	46	1	28	273	24	27	17
	Non-U.S. citizen–permanent resident	100	14	1	4	62	1	11	7
	U.S. citizen, incl. naturalized citizens	516	59	17	38	247	22	94	39
Computer sciences	Non-U.S. citizen–temporary resident	314	152	3	5	67	37	33	17
	Non-U.S. citizen–permanent resident	89	44		3	16	6	19	1
	U.S. citizen, incl. naturalized citizens	417	130	21	29	35	69	107	26
Environmental sciences	Non-U.S. citizen–temporary resident	212	122	6	4	26	27	9	18
	Non-U.S. citizen–permanent resident	69	49		3	10	0	4	3
	U.S. citizen, incl. naturalized citizens	518	180	30	36	70	68	101	33
Agricultural sciences	Non-U.S. citizen–temporary resident	347	162	7	9	8	83	40	38
	Non-U.S. citizen–permanent resident	83	47	1	3	6	10	12	4
	U.S. citizen, incl. naturalized citizens	463	199	8	30	31	39	116	40
Biological sciences	Non-U.S. citizen–temporary resident	1,212	586	25	134	173	124	71	99
	Non-U.S. citizen–permanent resident	576	312	3	73	74	16	49	49
	U.S. citizen, incl. naturalized citizens	3,627	1,743	127	364	403	222	526	242
Medical/health sciences	Non-U.S. citizen–temporary resident	252	74	5	12	56	41	52	12
	Non-U.S. citizen–permanent resident	69	27		6	5	4	21	6
	U.S. citizen, incl. naturalized citizens	942	184	27	44	57	98	458	74
Psychology	Non-U.S. citizen–temporary resident	127	26	2	14	32	12	34	7
	Non-U.S. citizen–permanent resident	90	11		5	18	6	44	6
	U.S. citizen, incl. naturalized citizens	2,886	369	34	204	382	198	1,453	246
Social sciences	Non-U.S. citizen–temporary resident	909	137	17	88	222	193	191	61
	Non-U.S. citizen–permanent resident	300	43	5	43	76	24	91	18
	U.S. citizen, incl. naturalized citizens	2,517	267	59	336	553	146	994	162
Total engineering	Non-U.S. citizen–temporary resident	2,396	1,341	21	58	264	265	322	125
	Non-U.S. citizen–permanent resident	593	335	9	25	62	41	84	37
	U.S. citizen, incl. naturalized citizens	2,688	1,089	140	239	170	404	461	185

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-38.
Primary mechanisms of support for 1997 S&E Ph.D. recipients, by degree field and citizenship status

Field	Citizenship status	All mechanisms	Research assistantships	Fellowships	Traineeships	Teaching assistantships	Other	Self-support	Unknown
		Percent							
TOTAL SCIENCE & ENGINEERING	Non-U.S. citizen–temporary resident	100.0	44.3	1.3	5.3	19.5	11.9	11.3	6.3
	Non-U.S. citizen–permanent resident	100.0	45.4	0.9	7.6	18.8	5.0	15.2	7.1
	U.S. citizen, incl. naturalized citizens	100.0	31.5	3.3	8.7	13.8	8.3	27.1	7.2
Total science	Non-U.S. citizen–temporary resident	100.0	38.5	1.6	6.8	23.8	12.3	10.3	6.8
	Non-U.S. citizen–permanent resident	100.0	41.6	0.7	8.8	21.6	4.4	15.5	7.4
	U.S. citizen, incl. naturalized citizens	100.0	29.7	2.9	8.7	15.3	7.0	29.1	7.3
Physical sciences	Non-U.S. citizen–temporary resident	100.0	53.6	1.0	3.2	28.1	4.7	3.5	5.9
	Non-U.S. citizen–permanent resident	100.0	48.5	0.6	3.6	29.9	2.5	5.3	9.7
	U.S. citizen, incl. naturalized citizens	100.0	48.9	4.0	6.5	17.1	5.8	10.4	7.3
Mathematics	Non-U.S. citizen–temporary resident	100.0	11.1	0.2	6.7	65.6	5.8	6.5	4.1
	Non-U.S. citizen–permanent resident	100.0	14.0	1.0	4.0	62.0	1.0	11.0	7.0
	U.S. citizen, incl. naturalized citizens	100.0	11.4	3.3	7.4	47.9	4.3	18.2	7.6
Computer sciences	Non-U.S. citizen–temporary resident	100.0	48.4	1.0	1.6	21.3	11.8	10.5	5.4
	Non-U.S. citizen–permanent resident	100.0	49.4	0.0	3.4	18.0	6.7	21.3	1.1
	U.S. citizen, incl. naturalized citizens	100.0	31.2	5.0	7.0	8.4	16.5	25.7	6.2
Environmental sciences	Non-U.S. citizen–temporary resident	100.0	57.5	2.8	1.9	12.3	12.7	4.2	8.5
	Non-U.S. citizen–permanent resident	100.0	71.0	0.0	4.3	14.5	0.0	5.8	4.3
	U.S. citizen, incl. naturalized citizens	100.0	34.7	5.8	6.9	13.5	13.1	19.5	6.4
Agricultural sciences	Non-U.S. citizen–temporary resident	100.0	46.7	2.0	2.6	2.3	23.9	11.5	11.0
	Non-U.S. citizen–permanent resident	100.0	56.6	1.2	3.6	7.2	12.0	14.5	4.8
	U.S. citizen, incl. naturalized citizens	100.0	43.0	1.7	6.5	6.7	8.4	25.1	8.6
Biological sciences	Non-U.S. citizen–temporary resident	100.0	48.3	2.1	11.1	14.3	10.2	5.9	8.2
	Non-U.S. citizen–permanent resident	100.0	54.2	0.5	12.7	12.8	2.8	8.5	8.5
	U.S. citizen, incl. naturalized citizens	100.0	48.1	3.5	10.0	11.1	6.1	14.5	6.7
Medical/health sciences	Non-U.S. citizen–temporary resident	100.0	29.4	2.0	4.8	22.2	16.3	20.6	4.8
	Non-U.S. citizen–permanent resident	100.0	39.1	0.0	8.7	7.2	5.8	30.4	8.7
	U.S. citizen, incl. naturalized citizens	100.0	19.5	2.9	4.7	6.1	10.4	48.6	7.9
Psychology	Non-U.S. citizen–temporary resident	100.0	20.5	1.6	11.0	25.2	9.4	26.8	5.5
	Non-U.S. citizen–permanent resident	100.0	12.2	0.0	5.6	20.0	6.7	48.9	6.7
	U.S. citizen, incl. naturalized citizens	100.0	12.8	1.2	7.1	13.2	6.9	50.3	8.5
Social sciences	Non-U.S. citizen–temporary resident	100.0	15.1	1.9	9.7	24.4	21.2	21.0	6.7
	Non-U.S. citizen–permanent resident	100.0	14.3	1.7	14.3	25.3	8.0	30.3	6.0
	U.S. citizen, incl. naturalized citizens	100.0	10.6	2.3	13.3	22.0	5.8	39.5	6.4
Total engineering	Non-U.S. citizen–temporary resident	100.0	56.0	0.9	2.4	11.0	11.1	13.4	5.2
	Non-U.S. citizen–permanent resident	100.0	56.5	1.5	4.2	10.5	6.9	14.2	6.2
	U.S. citizen, incl. naturalized citizens	100.0	40.5	5.2	8.9	6.3	15.0	17.2	6.9

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Earned Doctorates, special tabulations (1997).

See page 6-33 in Volume 1.

Appendix table 6-39.
Primary mechanisms of support for 1997 U.S. citizen-S&E Ph.D. recipients, by degree field and sex

Field	Sex	All mechanisms	Research assistantships	Fellowships	Traineeships	Teaching assistantships	Other	Self-support	Unknown
					Number				
TOTAL SCIENCE & ENGINEERING	Men	9,948	3,448	344	787	1,451	897	2,291	730
	Women	6,738	1,805	203	670	858	491	2,239	472
Total science	Men	7,670	2,517	236	619	1,305	544	1,888	561
	Women	6,328	1,647	171	599	834	440	2,181	456
Physical sciences	Men	1,644	816	67	94	280	102	165	120
	Women	468	217	17	43	81	20	55	35
Mathematics	Men	378	40	11	25	191	16	64	31
	Women	138	19	6	13	56	6	30	8
Computer sciences	Men	336	114	19	19	24	56	84	20
	Women	81	16	2	10	11	13	23	6
Environmental sciences	Men	380	132	20	17	48	53	86	24
	Women	138	48	10	19	22	15	15	9
Agricultural sciences	Men	327	144	8	15	19	28	86	27
	Women	136	55		15	12	11	30	13
Biological sciences	Men	2,010	955	63	184	231	123	301	153
	Women	1,617	788	64	180	172	99	225	89
Medical/health sciences	Men	252	59	10	14	28	30	99	12
	Women	690	125	17	30	29	68	359	62
Psychology	Men	944	110	13	65	142	64	469	81
	Women	1,942	259	21	139	240	134	984	165
Social sciences	Men	1,399	147	25	186	342	72	534	93
	Women	1,118	120	34	150	211	74	460	69
Total engineering	Men	2,278	931	108	168	146	353	403	169
	Women	410	158	32	71	24	51	58	16

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-39.
Primary mechanisms of support for 1997 U.S. citizen-S&E Ph.D. recipients, by degree field and sex

Field	Sex	All mechanisms	Research assistantships	Fellowships	Traineeships	Teaching assistantships	Other	Self-support	Unknown
		Percent							
TOTAL SCIENCE & ENGINEERING	Men	100.0	34.7	3.5	7.9	14.6	9.0	23.0	7.3
	Women	100.0	26.8	3.0	9.9	12.7	7.3	33.2	7.0
Total sciences	Men	100.0	32.8	3.1	8.1	17.0	7.1	24.6	7.3
	Women	100.0	26.0	2.7	9.5	13.2	7.0	34.5	7.2
Physical sciences	Men	100.0	49.6	4.1	5.7	17.0	6.2	10.0	7.3
	Women	100.0	46.4	3.6	9.2	17.3	4.3	11.8	7.5
Mathematics	Men	100.0	10.6	2.9	6.6	50.5	4.2	16.9	8.2
	Women	100.0	13.8	4.3	9.4	40.6	4.3	21.7	5.8
Computer sciences	Men	100.0	33.9	5.7	5.7	7.1	16.7	25.0	6.0
	Women	100.0	19.8	2.5	12.3	13.6	16.0	28.4	7.4
Environmental sciences	Men	100.0	34.7	5.3	4.5	12.6	13.9	22.6	6.3
	Women	100.0	34.8	7.2	13.8	15.9	10.9	10.9	6.5
Agricultural sciences	Men	100.0	44.0	2.4	4.6	5.8	8.6	26.3	8.3
	Women	100.0	40.4	0.0	11.0	8.8	8.1	22.1	9.6
Biological sciences	Men	100.0	47.5	3.1	9.2	11.5	6.1	15.0	7.6
	Women	100.0	48.7	4.0	11.1	10.6	6.1	13.9	5.5
Medical/health sciences	Men	100.0	23.4	4.0	5.6	11.1	11.9	39.3	4.8
	Women	100.0	18.1	2.5	4.3	4.2	9.9	52.0	9.0
Psychology	Men	100.0	11.7	1.4	6.9	15.0	6.8	49.7	8.6
	Women	100.0	13.3	1.1	7.2	12.4	6.9	50.7	8.5
Social sciences	Men	100.0	10.5	1.8	13.3	24.4	5.1	38.2	6.6
	Women	100.0	10.7	3.0	13.4	18.9	6.6	41.1	6.2
Total engineering	Men	100.0	40.9	4.7	7.4	6.4	15.5	17.7	7.4
	Women	100.0	38.5	7.8	17.3	5.9	12.4	14.1	3.9

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Earned Doctorates, special tabulations, 1997.

See page 6-33 in Volume 1.

Appendix table 6-40.
Primary mechanisms of support for 1997 U.S. citizen-S&E Ph.D. recipients, by degree field and race/ethnicity

Field	Race/ethnicity	All mechanisms	Research assistantships	Fellowships	Traineeships	Teaching assistantships	Other	Self-support	Unknown
					Number				
TOTAL SCIENCE & ENGINEERING	Underrepresented minority	1,238	257	79	192	104	164	319	123
	Asian/Pacific Islander	1,043	428	42	98	101	71	175	128
	White	13,902	4,449	407	1,138	2,050	1,125	3,932	801
Total science	Underrepresented minority	1,063	220	59	164	95	131	289	105
	Asian/Pacific Islander	758	297	31	82	86	43	122	97
	White	11,776	3,566	303	947	1,910	787	3,563	700
Physical sciences	Underrepresented minority	106	30	9	11	14	19	8	15
	Asian/Pacific Islander	155	83	7	12	18	6	9	20
	White	1,779	894	65	110	317	94	198	101
Mathematics	Underrepresented minority	22	1	3	1	8	0	6	3
	Asian/Pacific Islander	34	3	1	1	16	2	3	8
	White	440	54	12	36	215	20	81	22
Computer sciences	Underrepresented minority	20	5	2	2	1	4	5	1
	Asian/Pacific Islander	42	13	3	1	4	5	10	6
	White	337	110	14	23	29	58	88	15
Environmental sciences	Underrepresented minority	23	4	2	2	3	5	6	1
	Asian/Pacific Islander	18	8	0	1	2	1	1	5
	White	458	161	28	33	63	60	90	23
Agricultural sciences	Underrepresented minority	31	10	2	2	1	7	4	5
	Asian/Pacific Islander	17	7	0	1	1	2	3	3
	White	396	177	5	27	28	30	106	23
Biological sciences	Underrepresented minority	236	104	16	38	14	18	22	24
	Asian/Pacific Islander	256	137	12	29	18	11	24	25
	White	3,036	1,470	95	294	367	186	466	158
Medical/health sciences	Underrepresented minority	84	17	5	12	5	10	25	10
	Asian/Pacific Islander	41	17	1	1	6	6	7	3
	White	802	149	21	31	46	81	417	57
Psychology	Underrepresented minority	319	25	14	46	23	42	136	33
	Asian/Pacific Islander	101	19	1	16	10	6	35	14
	White	2,422	323	19	138	345	148	1,259	190
Social sciences	Underrepresented minority	222	24	6	50	26	26	77	13
	Asian/Pacific Islander	94	10	6	20	11	4	30	13
	White	2,106	228	44	255	500	110	858	111
Total engineering	Underrepresented minority	175	37	20	28	9	33	30	18
	Asian/Pacific Islander	285	131	11	16	15	28	53	31
	White	2,126	883	104	191	140	338	369	101

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-40.
Primary mechanisms of support for 1997 U.S. citizen-S&E Ph.D. recipients, by degree field and race/ethnicity

Field	Race/ethnicity	All mechanisms	Research assistantships	Fellowships	Traineeships	Teaching assistantships	Other	Self-support	Unknown
		Percent							
TOTAL SCIENCE & ENGINEERING	Underrepresented minority	100.0	20.8	6.4	15.5	8.4	13.2	25.8	9.9
	Asian/Pacific Islander	100.0	41.0	4.0	9.4	9.7	6.8	16.8	12.3
	White	100.0	32.0	2.9	8.2	14.7	8.1	28.3	5.8
Total science	Underrepresented minority	100.0	20.7	5.6	15.4	8.9	12.3	27.2	9.9
	Asian/Pacific Islander	100.0	39.2	4.1	10.8	11.3	5.7	16.1	12.8
	White	100.0	30.3	2.6	8.0	16.2	6.7	30.3	5.9
Physical sciences	Underrepresented minority	100.0	28.3	8.5	10.4	13.2	17.9	7.5	14.2
	Asian/Pacific Islander	100.0	53.5	4.5	7.7	11.6	3.9	5.8	12.9
	White	100.0	50.3	3.7	6.2	17.8	5.3	11.1	5.7
Mathematics	Underrepresented minority	100.0	4.5	13.6	4.5	36.4	0.0	27.3	13.6
	Asian/Pacific Islander	100.0	8.8	2.9	2.9	47.1	5.9	8.8	23.5
	White	100.0	12.3	2.7	8.2	48.9	4.5	18.4	5.0
Computer sciences	Underrepresented minority	100.0	25.0	10.0	10.0	5.0	20.0	25.0	5.0
	Asian/Pacific Islander	100.0	31.0	7.1	2.4	9.5	11.9	23.8	14.3
	White	100.0	32.6	4.2	6.8	8.6	17.2	26.1	4.5
Environmental sciences	Underrepresented minority	100.0	17.4	8.7	8.7	13.0	21.7	26.1	4.3
	Asian/Pacific Islander	100.0	44.4	0.0	5.6	11.1	5.6	5.6	27.8
	White	100.0	35.2	6.1	7.2	13.8	13.1	19.7	5.0
Agricultural sciences	Underrepresented minority	100.0	32.3	6.5	6.5	3.2	22.6	12.9	16.1
	Asian/Pacific Islander	100.0	41.2	0.0	5.9	5.9	11.8	17.6	17.6
	White	100.0	44.7	1.3	6.8	7.1	7.6	26.8	5.8
Biological sciences	Underrepresented minority	100.0	44.1	6.8	16.1	5.9	7.6	9.3	10.2
	Asian/Pacific Islander	100.0	53.5	4.7	11.3	7.0	4.3	9.4	9.8
	White	100.0	48.4	3.1	9.7	12.1	6.1	15.3	5.2
Medical/health sciences	Underrepresented minority	100.0	20.2	6.0	14.3	6.0	11.9	29.8	11.9
	Asian/Pacific Islander	100.0	41.5	2.4	2.4	14.6	14.6	17.1	7.3
	White	100.0	18.6	2.6	3.9	5.7	10.1	52.0	7.1
Psychology	Underrepresented minority	100.0	7.8	4.4	14.4	7.2	13.2	42.6	10.3
	Asian/Pacific Islander	100.0	18.8	1.0	15.8	9.9	5.9	34.7	13.9
	White	100.0	13.3	0.8	5.7	14.2	6.1	52.0	7.8
Social sciences	Underrepresented minority	100.0	10.8	2.7	22.5	11.7	11.7	34.7	5.9
	Asian/Pacific Islander	100.0	10.6	6.4	21.3	11.7	4.3	31.9	13.8
	White	100.0	10.8	2.1	12.1	23.7	5.2	40.7	5.3
Total engineering	Underrepresented minority	100.0	21.1	11.4	16.0	5.1	18.9	17.1	10.3
	Asian/Pacific Islander	100.0	46.0	3.9	5.6	5.3	9.8	18.6	10.9
	White	100.0	41.5	4.9	9.0	6.6	15.9	17.4	4.8

NOTE: Underrepresented minorities include American Indian/Alaskan Native, black, and Hispanic respondents.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Earned Doctorates, special tabulations (1997).

See page 6-33 in Volume 1.

Appendix table 6-41.
Full-time S&E graduate students with a research assistantship as mechanism of primary support, by field: 1980–1997

Field	1980	1982	1984	1986	1988	1990	1991	1992	1993	1994	1995	1996	1997
	Number of full-time S&E graduate students												
TOTAL SCIENCE & ENGINEERING ..	51,567	52,580	57,735	66,010	74,588	80,746	85,175	88,030	90,156	92,011	89,950	87,695	88,045
Total science	37,649	37,974	41,435	45,592	51,139	55,447	58,399	60,490	62,225	63,929	62,906	61,182	61,171
Physical sciences	8,340	8,768	9,628	10,992	12,056	12,138	12,229	12,445	12,293	12,378	11,848	11,527	11,321
Astronomy	270	250	307	323	338	383	397	425	395	467	439	391	355
Chemistry	4,604	4,908	5,392	6,173	6,644	6,572	6,569	6,606	6,586	6,690	6,506	6,558	6,464
Physics	3,462	3,579	3,893	4,447	5,026	5,153	5,232	5,359	5,251	5,131	4,842	4,508	4,442
Other	4	31	36	49	48	30	31	55	61	90	61	70	60
Mathematics	784	845	872	1,038	1,226	1,335	1,356	1,410	1,436	1,534	1,451	1,296	1,407
Computer sciences	1,036	1,191	1,613	2,322	3,032	3,334	3,565	3,682	3,802	3,903	3,918	3,978	4,035
Environmental sciences	3,750	3,327	3,565	3,827	3,879	4,189	4,387	4,615	4,729	4,857	4,659	4,303	4,275
Atmospheric sciences	489	462	431	418	479	493	529	606	626	659	619	641	630
Earth sciences	2,022	1,775	1,962	2,105	1,973	2,054	2,061	2,091	2,172	2,215	2,151	1,945	1,928
Oceanography	818	780	850	962	1,051	1,170	1,273	1,339	1,331	1,401	1,258	1,164	1,144
Other	421	310	322	342	376	472	524	579	600	582	631	553	573
Life sciences	15,891	16,238	17,570	19,219	21,570	23,923	25,809	26,755	28,046	29,201	29,229	28,225	28,574
Agricultural sciences	4,650	4,673	4,775	4,703	4,552	4,755	5,002	5,174	5,239	5,385	5,377	5,172	5,088
Biological sciences	9,686	9,970	10,913	12,085	14,125	15,764	16,846	17,627	18,853	19,438	19,249	18,676	18,648
Medical sciences	951	949	1,160	1,465	1,843	2,188	2,584	2,630	2,582	2,881	2,931	2,771	2,992
Other	604	646	722	966	1,050	1,216	1,377	1,324	1,372	1,497	1,672	1,606	1,846
Psychology	2,567	2,723	3,024	3,101	3,715	4,051	4,235	4,304	4,557	4,655	4,585	4,763	4,839
Social sciences	5,281	4,882	5,163	5,093	5,661	6,477	6,818	7,279	7,362	7,401	7,216	7,090	6,720
Anthropology	349	315	292	287	353	449	462	454	452	454	431	445	470
Economics	2,169	1,894	1,957	2,003	2,064	2,055	2,150	2,165	2,214	2,173	2,083	2,020	1,869
History of science	14	11	10	19	23	14	34	24	7	22	17	22	15
Linguistics	145	140	135	126	179	218	178	169	196	197	177	201	203
Political science	923	974	1,160	1,015	1,197	1,375	1,527	1,757	1,637	1,671	1,628	1,566	1,380
Sociology	838	798	779	767	860	1,117	1,073	1,109	1,202	1,160	1,131	1,031	988
Other	843	750	830	876	985	1,249	1,394	1,601	1,654	1,724	1,749	1,805	1,795
Total engineering	13,918	14,606	16,300	20,418	23,449	25,299	26,776	27,540	27,931	28,082	27,044	26,513	26,874
Aeronautical/astronautical	580	617	673	823	934	1,137	1,232	1,222	1,266	1,245	1,197	1,183	1,225
Chemical	1,845	2,099	2,329	2,582	2,814	2,839	2,987	3,012	3,120	3,270	3,104	3,052	2,969
Civil	2,121	2,027	2,440	2,786	3,072	3,115	3,565	3,936	4,048	4,254	4,225	4,124	3,971
Electrical/electronic	2,851	2,950	3,179	4,474	5,735	6,224	6,556	6,867	6,925	6,855	6,694	6,920	7,486
Industrial	591	548	554	705	1,030	1,130	1,249	1,235	1,271	1,342	1,339	1,282	1,264
Mechanical	2,052	2,213	2,663	3,666	4,069	4,306	4,630	4,731	4,787	4,688	4,413	4,272	4,355
Materials	1,390	1,522	1,749	2,247	2,333	2,547	2,507	2,661	2,651	2,608	2,536	2,407	2,376
Other	2,488	2,630	2,713	3,135	3,462	4,001	4,050	3,876	3,863	3,820	3,536	3,273	3,228

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-41.
Full-time S&E graduate students with a research assistantship as mechanism of primary support, by field: 1980–1997

Field	1980	1982	1984	1986	1988	1990	1991	1992	1993	1994	1995	1996	1997
	Percent of full-time S&E graduate students												
TOTAL SCIENCE & ENGINEERING	21.6	21.5	22.7	24.8	27.1	27.6	27.7	27.3	27.3	27.7	27.3	26.7	26.9
Total science	19.2	19.5	20.8	22.1	24.1	24.4	24.7	24.4	24.3	24.5	24.1	23.3	23.4
Physical sciences	36.4	36.5	37.2	39.6	42.2	41.2	40.6	40.6	40.2	41.2	41.0	41.2	42.1
Astronomy	45.5	42.4	51.5	49.4	47.9	48.5	49.0	50.6	46.6	49.0	50.4	45.8	46.2
Chemistry	33.9	34.3	35.6	38.6	41.3	40.1	39.3	38.9	38.3	39.1	38.8	39.7	40.4
Physics	40.0	39.5	39.1	40.6	43.2	42.3	42.1	42.2	42.4	43.6	43.8	43.3	44.8
Other	4.7	36.5	21.7	32.0	33.6	24.6	23.1	37.9	37.7	40.9	28.1	35.7	33.0
Mathematics	7.9	7.8	7.7	8.4	9.1	9.6	9.5	9.6	9.9	10.8	10.8	10.0	11.6
Computer sciences	15.7	13.0	14.1	15.5	20.0	20.0	21.6	21.1	21.9	23.4	23.8	23.2	22.0
Environmental sciences	34.5	29.4	30.4	34.0	38.1	40.9	42.3	42.0	41.6	42.3	41.3	39.7	40.5
Atmospheric sciences	64.5	59.3	55.5	48.9	57.8	59.5	61.6	63.2	63.9	66.4	64.5	65.4	65.2
Earth sciences	28.8	23.6	24.2	28.5	31.3	35.4	36.2	35.5	36.4	37.3	37.1	34.9	35.5
Oceanography	52.2	49.0	53.2	56.8	64.5	60.5	63.9	62.8	61.1	60.1	56.5	56.1	58.0
Other	27.4	21.7	25.4	26.0	26.4	28.0	28.6	28.8	26.8	26.5	27.5	25.2	26.3
Life sciences	22.1	23.3	25.1	27.3	29.6	30.9	31.5	31.1	30.6	30.2	29.3	27.9	27.9
Agricultural sciences	45.7	46.1	48.2	50.3	49.9	52.3	53.8	54.7	55.3	56.7	55.9	55.6	55.9
Biological sciences	25.7	27.2	29.4	32.0	36.0	38.5	39.5	39.7	40.6	40.5	39.8	39.1	39.7
Medical sciences	10.9	11.7	14.1	16.8	19.2	20.7	23.5	22.4	20.4	21.9	21.4	20.0	20.7
Other	4.0	4.4	4.9	6.6	7.0	7.2	7.3	6.5	6.0	5.8	5.9	5.3	5.8
Psychology	9.6	10.6	11.6	11.8	13.2	13.2	13.1	12.6	13.1	13.2	13.0	13.4	13.6
Social sciences	11.2	11.0	12.1	11.9	12.9	13.4	13.5	13.4	13.2	13.2	12.8	12.5	12.1
Anthropology	7.6	7.7	7.4	7.1	8.3	9.3	9.1	8.5	8.3	7.8	7.4	7.4	8.1
Economics	19.2	16.6	18.1	18.3	18.9	18.3	18.1	17.6	18.3	18.3	17.8	17.8	17.8
History of science	5.8	4.9	4.1	8.0	8.6	4.5	11.2	7.3	2.1	6.5	5.0	6.3	4.0
Linguistics	6.4	6.5	5.8	5.3	7.1	8.4	7.0	6.8	7.7	7.8	7.1	7.9	8.6
Political science	6.9	7.1	9.1	7.6	9.1	9.0	9.5	9.9	8.9	9.3	9.2	8.9	8.1
Sociology	13.3	14.4	14.5	14.8	15.2	17.3	16.3	15.6	16.5	15.6	15.4	14.3	13.4
Other	9.3	10.4	11.6	13.0	14.2	16.1	17.0	17.7	17.2	16.6	16.0	15.3	15.0
Total engineering	32.7	29.4	29.5	33.9	37.2	38.3	37.7	37.0	37.8	39.2	39.9	40.3	41.0
Aeronautical/astronautical	43.7	40.5	36.3	38.2	36.9	37.8	37.1	37.0	38.8	41.5	44.4	45.9	48.4
Chemical	41.1	37.4	40.6	46.2	52.5	52.2	51.6	50.7	51.6	53.6	52.1	51.7	51.3
Civil	26.7	21.6	24.2	27.9	30.9	30.8	31.5	31.6	32.5	33.7	34.5	35.0	35.3
Electrical/electronic	28.6	25.6	22.8	27.5	32.4	33.3	32.9	32.7	34.0	35.3	36.8	38.5	39.6
Industrial	15.8	14.4	16.3	18.5	24.0	23.7	22.3	20.3	21.5	22.7	25.1	25.0	24.9
Mechanical	35.1	30.5	30.6	37.5	39.1	39.6	39.6	38.2	38.6	39.5	39.7	40.0	41.7
Materials	61.7	61.4	60.9	66.7	67.3	64.8	61.8	62.3	62.4	63.5	65.4	65.2	64.9
Other	35.3	32.2	31.5	34.1	37.3	43.7	43.3	43.1	42.4	44.9	42.4	40.5	40.7

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Graduate Students and Postdoctorates in Science and Engineering, various years, special tabulations.

See figure 6-25 in Volume 1.

Appendix table 6-42.
Full-time S&E graduate students with a research assistantship as primary support mechanism, by field and primary source of support: 1997

Field	Total number	Total percent	Number of research assistants		Percent of research assistants	
			Federal	Non-Federal	Federal	Non-Federal
TOTAL SCIENCE & ENGINEERING	88,045	100.0	43,187	44,858	49.1	50.9
Total science	61,171	69.5	30,494	30,677	49.9	50.1
Physical sciences	11,321	12.9	8,139	3,182	71.9	28.1
Astronomy	355	0.4	278	77	78.3	21.7
Chemistry	6,464	7.3	4,387	2,077	67.9	32.1
Physics	4,442	5.0	3,437	1,005	77.4	22.6
Other	60	0.1	37	23	61.7	38.3
Mathematics	1,407	1.6	643	764	45.7	54.3
Computer sciences	4,035	4.6	2,432	1,603	60.3	39.7
Environmental sciences	4,275	4.9	2,618	1,657	61.2	38.8
Atmospheric sciences	630	0.7	556	74	88.3	11.7
Earth sciences	1,928	2.2	1,108	820	57.5	42.5
Oceanography	1,144	1.3	748	396	65.4	34.6
Other	573	0.7	206	367	36.0	64.0
Life sciences	28,574	32.5	13,772	14,802	48.2	51.8
Agricultural sciences	5,088	5.8	1,624	3,464	31.9	68.1
Biological sciences	18,648	21.2	10,331	8,317	55.4	44.6
Medical sciences	2,992	3.4	1,281	1,711	42.8	57.2
Other	1,846	2.1	536	1,310	29.0	71.0
Psychology	4,839	5.5	1,477	3,362	30.5	69.5
Social sciences	6,720	7.6	1,413	5,307	21.0	79.0
Anthropology	470	0.5	97	373	20.6	79.4
Economics	1,869	2.1	517	1,352	27.7	72.3
History of science	15	0.0	0	15	0.0	100.0
Linguistics	203	0.2	43	160	21.2	78.8
Political science	1,380	1.6	107	1,273	7.8	92.2
Sociology	988	1.1	233	755	23.6	76.4
Other	1,795	2.0	416	1,379	23.2	76.8
Total engineering	26,874	30.5	12,693	14,181	47.2	52.8
Aeronautical/astronautical	1,225	1.4	793	432	64.7	35.3
Chemical	2,969	3.4	1,316	1,653	44.3	55.7
Civil	3,971	4.5	1,423	2,548	35.8	64.2
Electrical/electronics	7,486	8.5	3,726	3,760	49.8	50.2
Industrial	1,264	1.4	366	898	29.0	71.0
Mechanical	4,355	4.9	2,225	2,130	51.1	48.9
Materials	2,376	2.7	1,328	1,048	55.9	44.1
Other	3,228	3.7	1,516	1,712	47.0	53.0

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Graduate Students and Postdoctorates in Science and Engineering, special tabulations, 1997.

See page 6-37 in Volume 1.

Appendix table 6-43.
Percentage of full-time S&E graduate students with a research assistantship as primary support mechanism whose primary source of support is the Federal Government, by field: 1980–97

Field	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
TOTAL SCIENCE & ENGINEERING	56.9	55.3	53.8	53.1	51.0	49.9	49.6	49.8	49.3	48.8	47.7	47.9	48.4	49.4	49.6	49.6	49.5	49.1
Total science	55.2	53.8	52.0	51.2	50.2	51.1	50.8	51.2	50.5	50.2	49.3	49.5	50.1	51.1	51.0	50.7	50.5	49.9
Physical sciences	83.7	84.5	80.9	81.7	81.1	78.4	78.8	76.8	74.4	73.6	72.9	72.8	73.0	74.7	76.1	75.0	73.4	71.9
Astronomy	87.4	87.1	80.8	86.7	82.1	86.2	88.9	75.3	79.0	77.4	70.2	72.5	79.1	83.5	80.5	80.0	80.1	78.3
Chemistry	81.7	80.9	80.2	77.4	77.3	75.3	76.2	73.4	71.8	69.8	70.6	69.1	69.8	71.6	73.8	72.8	70.1	67.9
Physics	86.0	89.5	82.5	87.9	86.5	82.7	82.2	81.7	77.8	78.5	76.1	77.5	76.4	78.1	78.8	77.7	77.7	77.4
Other	100.0	13.3	12.9	39.5	52.8	36.7	42.9	52.6	41.7	50.0	50.0	48.4	72.7	70.5	74.4	52.5	60.0	61.7
Mathematics	53.7	44.7	44.6	43.6	47.1	47.9	51.8	57.2	54.3	50.8	45.7	47.5	48.5	51.3	48.4	45.4	47.5	45.7
Computer sciences	65.4	65.1	64.1	60.2	60.1	52.0	49.3	53.2	54.2	53.5	53.5	54.8	54.2	58.5	61.0	62.1	59.8	60.3
Environmental sciences	71.8	69.3	69.6	66.4	65.2	64.8	61.9	61.5	59.6	59.7	59.0	58.4	62.5	63.4	63.3	63.0	63.4	61.2
Atmospheric sciences	91.0	89.0	89.2	83.4	81.4	87.7	86.6	86.8	78.9	89.0	93.5	86.0	89.6	87.4	86.8	81.9	83.8	88.3
Earth sciences	71.8	65.8	66.3	63.7	62.4	60.3	58.4	58.5	57.5	59.4	57.8	57.4	60.6	61.6	60.9	62.3	62.4	57.5
Oceanography	72.0	69.9	69.6	70.4	70.5	71.7	66.6	65.9	60.5	55.1	57.4	56.9	62.7	65.0	65.0	67.5	67.0	65.4
Other	49.2	61.2	59.4	49.5	46.0	42.0	39.8	33.7	43.9	39.4	32.2	38.0	40.6	41.0	41.9	37.7	35.6	36.0
Life sciences	48.0	46.5	45.0	44.1	42.1	44.7	44.6	46.4	46.7	47.3	46.8	47.2	47.9	48.5	48.3	48.2	48.9	48.2
Agricultural sciences	34.8	32.0	31.5	28.9	25.1	29.6	29.5	31.3	32.3	32.8	32.2	33.3	34.2	33.4	32.3	34.4	35.0	31.9
Biological sciences	55.6	54.1	52.5	52.2	50.9	52.3	52.2	53.1	53.1	54.1	53.5	53.8	54.1	55.0	54.7	54.9	55.9	55.4
Medical sciences	46.3	44.9	42.8	42.5	37.2	40.1	38.6	43.5	42.1	41.6	38.8	38.8	41.4	42.4	43.2	39.8	40.6	42.8
Other	31.0	34.9	29.3	27.8	28.7	30.9	31.5	33.8	31.6	28.0	32.2	31.6	31.9	27.6	32.2	29.6	26.2	29.0
Psychology	36.7	35.9	34.0	31.9	31.8	33.1	32.9	33.4	32.5	33.1	32.7	33.9	33.4	34.0	31.6	32.0	31.5	30.5
Social sciences	27.3	24.4	19.9	18.5	17.7	19.1	17.4	16.7	16.6	16.6	17.0	18.1	19.1	20.2	19.4	20.1	20.4	21.0
Anthropology	30.1	40.6	28.6	24.8	15.8	22.4	16.7	19.7	19.5	15.7	12.2	13.4	20.7	23.0	19.6	23.7	20.7	20.6
Economics	30.8	25.9	23.2	22.7	21.5	23.7	22.6	22.5	21.7	23.1	21.6	21.0	22.1	24.4	24.9	25.8	24.0	27.7
History of science	7.1	0.0	0.0	0.0	0.0	9.1	0.0	5.6	13.0	7.1	21.4	20.6	12.5	42.9	18.2	5.9	13.6	0.0
Linguistics	31.7	27.6	23.6	27.7	24.4	22.7	31.7	16.8	10.1	19.3	14.7	23.6	28.4	28.6	32.5	32.8	27.4	21.2
Political science	10.1	4.6	6.0	4.9	6.6	6.1	4.4	3.1	5.4	6.0	6.8	9.8	5.6	8.7	6.8	7.1	9.6	7.8
Sociology	39.4	36.9	25.8	23.5	21.7	28.4	23.5	19.2	19.7	18.3	19.4	21.3	22.5	21.5	19.1	21.0	23.5	23.6
Other	23.7	23.0	19.2	18.4	20.7	14.3	13.6	17.2	17.4	16.4	20.4	20.9	26.3	23.2	23.4	23.1	23.3	23.2
Total engineering	61.3	59.3	58.6	57.9	53.2	47.1	46.8	46.8	46.6	45.6	44.2	44.4	44.7	45.6	46.2	46.9	47.0	47.2
Aero/astronautical	64.7	68.4	76.0	78.3	77.9	65.9	67.8	69.6	67.9	59.9	57.3	60.1	58.0	57.4	57.8	60.7	62.6	64.7
Chemical	57.2	54.1	51.6	52.0	49.2	44.9	47.3	48.2	46.0	44.5	44.9	43.1	43.3	44.6	43.0	45.6	47.8	44.3
Civil	58.3	50.9	52.2	47.1	45.5	41.7	40.1	42.1	39.7	39.4	37.9	39.5	40.0	39.0	39.0	37.4	36.4	35.8
Electrical/electronic	69.5	68.2	69.9	66.4	57.6	46.0	45.4	45.6	47.3	44.0	42.9	43.7	43.8	44.3	46.7	49.1	47.4	49.8
Industrial	44.2	44.6	34.5	39.5	30.3	26.9	24.8	26.8	28.1	25.2	23.8	29.9	27.4	28.2	31.1	30.6	29.4	29.0
Mechanical	60.4	60.0	57.7	60.0	55.2	48.3	46.6	48.8	50.7	50.3	47.7	45.8	46.6	50.3	51.3	50.0	49.7	51.1
Materials	73.2	72.7	70.1	67.8	63.5	58.4	58.9	54.8	55.2	56.2	52.1	50.6	52.8	52.5	52.6	54.1	59.7	55.9
Other	54.9	52.5	51.6	51.5	48.5	44.9	45.4	44.0	41.4	43.8	43.5	45.0	45.2	46.6	47.4	47.6	47.0	47.0

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Graduate Students and Postdoctorates in Science and Engineering, various years, special tabulations.

See figure 6-27 in Volume 1.

Appendix table 6-44.
Full-time S&E graduate students with a research assistantship as primary support mechanism, by Federal agency of primary support: 1980–97

	All Federal agencies	National Institutes of Health	Other Department of Health & Human Services	National Science Foundation	Department of Defense	Department of Agriculture[a]	National Aeronautics and Space Administration[a]	All other agencies
				Number				
1980	29,316	5,436	587	7,627	2,934	NA	NA	12,732
1981	29,146	5,505	543	7,596	3,297	NA	NA	12,205
1982	28,313	5,295	509	7,747	3,467	NA	NA	11,295
1983	29,152	5,456	549	8,066	3,934	NA	NA	11,147
1984	29,463	5,762	583	8,283	4,081	NA	NA	10,754
1985	30,433	6,147	751	8,558	4,195	1,818	NA	8,964
1986	32,739	7,001	710	9,084	4,646	1,954	NA	9,344
1987	34,996	7,662	814	9,487	5,617	2,325	NA	9,091
1988	36,752	8,598	761	9,822	6,028	2,300	NA	9,243
1989	38,555	9,342	906	9,875	5,916	2,448	NA	10,068
1990	38,504	9,463	965	9,705	5,412	2,431	NA	10,528
1991	40,790	9,990	1,055	10,161	5,484	2,816	NA	11,284
1992	42,586	10,623	986	10,652	5,727	2,959	NA	11,639
1993	44,502	11,368	725	10,814	6,232	3,019	NA	12,344
1994	45,621	11,614	902	11,194	6,217	3,143	NA	12,551
1995	44,597	11,416	997	10,662	6,305	2,994	NA	12,223
1996	43,371	11,197	1,046	10,256	6,003	2,750	1,780	10,339
1997	43,187	11,314	1,111	10,398	6,367	2,406	2,063	9,528
				Percent				
1980	100.0	18.5	2.0	26.0	10.0	NA	NA	43.4
1981	100.0	18.9	1.9	26.1	11.3	NA	NA	41.9
1982	100.0	18.7	1.8	27.4	12.2	NA	NA	39.9
1983	100.0	18.7	1.9	27.7	13.5	NA	NA	38.2
1984	100.0	19.6	2.0	28.1	13.9	NA	NA	36.5
1985	100.0	20.2	2.5	28.1	13.8	6.0	NA	29.5
1986	100.0	21.4	2.2	27.7	14.2	6.0	NA	28.5
1987	100.0	21.9	2.3	27.1	16.1	6.6	NA	26.0
1988	100.0	23.4	2.1	26.7	16.4	6.3	NA	25.1
1989	100.0	24.2	2.3	25.6	15.3	6.3	NA	26.1
1990	100.0	24.6	2.5	25.2	14.1	6.3	NA	27.3
1991	100.0	24.5	2.6	24.9	13.4	6.9	NA	27.7
1992	100.0	24.9	2.3	25.0	13.4	6.9	NA	27.3
1993	100.0	25.5	1.6	24.3	14.0	6.8	NA	27.7
1994	100.0	25.5	2.0	24.5	13.6	6.9	NA	27.5
1995	100.0	25.6	2.2	23.9	14.1	6.7	NA	27.4
1996	100.0	25.8	2.4	23.6	13.8	6.3	4.1	23.8
1997	100.0	26.2	2.6	24.1	14.7	5.6	4.8	22.1

NA = not available

NOTE: Percentages may not total 100 because of rounding.

[a]Data were reported for the first time in 1985 for the Department of Agriculture and in 1996 for the National Aeronautics and Space Administration.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Graduate Students and Postdoctorates in Science and Engineering, various years, special tabulations.

See page 6-37 in Volume 1.

Appendix table 6-45.
Field distribution of full-time S&E graduate students with a research assistantship as primary support mechanism, by Federal agency of primary support: 1997
(Percentages)

Field	All Federal agencies	National Science Foundation	Department of Defense	National Institutes of Health	Other Department of Health & Human Services	Department of Agriculture	National Aeronautics and Space Administration	All other agencies
TOTAL SCIENCE & ENGINEERING	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total science	70.6	64.2	42.0	95.0	90.0	92.8	49.2	64.5
Physical sciences	18.8	29.0	13.6	12.4	24.9	1.0	22.7	22.0
Astronomy	0.6	0.8	0.0	0.0	0.6	0.0	6.1	0.6
Chemistry	10.2	14.8	6.1	11.9	22.1	1.0	4.6	7.8
Physics	8.0	13.3	7.5	0.4	2.2	0.0	12.0	13.2
Other	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Mathematics	1.5	2.5	2.4	0.4	0.8	0.6	0.7	1.5
Computer sciences	5.6	8.9	16.3	0.6	1.8	0.5	4.9	2.8
Environmental sciences	6.1	10.2	3.8	0.2	0.5	2.0	14.0	10.0
Atmospheric sciences	1.3	1.9	1.0	0.0	0.0	0.2	4.0	2.1
Earth sciences	2.6	5.8	0.8	0.0	0.0	0.8	5.8	3.3
Oceanography	1.7	2.0	1.9	0.1	0.3	0.4	2.3	3.6
Other	0.5	0.4	0.1	0.1	0.2	0.5	1.8	1.0
Life sciences	31.9	10.2	4.5	72.9	45.5	74.1	3.7	19.1
Agricultural sciences	3.8	0.8	0.5	0.1	0.6	37.7	0.7	5.9
Biological sciences	23.9	8.9	3.3	61.9	29.7	34.9	2.9	10.2
Medical sciences	3.0	0.3	0.5	8.5	8.3	1.5	0.0	1.4
Other	1.2	0.2	0.1	2.4	6.9	0.0	0.1	1.7
Psychology	3.4	1.0	1.0	7.3	13.4	0.2	0.9	3.2
Social sciences	3.3	2.4	0.5	1.2	3.1	14.4	2.2	6.0
Anthropology	0.2	0.2	0.1	0.2	0.2	0.0	0.0	0.4
Economics	1.2	0.5	0.0	0.1	0.5	11.2	0.0	1.9
Linguistics	0.1	0.2	0.0	0.1	0.3	0.0	0.0	0.0
Political science	0.2	0.3	0.0	0.0	0.2	0.0	0.0	0.8
Sociology	0.5	0.5	0.0	0.7	0.6	1.5	0.2	0.6
Other	1.0	0.8	0.3	0.1	1.3	1.6	2.0	2.2
Total engineering	29.4	35.8	58.0	5.0	10.0	7.2	50.8	35.5
Aeronautical/astronautical	1.8	0.9	4.0	0.0	0.3	0.0	13.9	1.6
Chemical	3.0	5.1	2.4	0.5	0.5	0.9	3.3	5.0
Civil	3.3	3.7	2.8	0.4	0.5	1.4	5.5	7.0
Electrical/electronics	8.6	10.9	26.3	0.6	3.6	0.6	9.2	6.4
Industrial	0.8	1.2	0.8	0.2	0.2	0.0	1.0	1.6
Mechanical	5.2	6.5	10.4	0.5	3.4	0.5	11.6	5.6
Materials	3.1	4.4	6.4	0.1	0.8	0.2	2.7	4.1
Other	3.5	3.2	4.9	2.7	0.6	3.7	3.6	4.2

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Graduate Students and Postdoctorates in Science and Engineering, special tabulations, 1997.

See figure 6-28 in Volume 1.

Appendix table 6-46.
Federal agency distribution of full-time S&E graduate students with a research assistantship as primary support mechanism, by field: 1997
(Percentages)

Field	All Federal agencies	National Science Foundation	Department of Defense	National Institutes of Health	Other Department of Health & Human Services	Department of Agriculture	National Aeronautics and Space Administration	All other agencies
TOTAL SCIENCE & ENGINEERING	100.0	24.1	14.7	26.2	2.6	5.6	4.8	22.1
Total science	100.0	21.9	8.8	35.3	3.3	7.3	3.3	20.2
Physical sciences	100.0	37.0	10.6	17.2	3.4	0.3	5.8	25.7
Astronomy	100.0	30.6	0.4	0.0	2.5	0.0	45.3	21.2
Chemistry	100.0	35.1	8.9	30.7	5.6	0.5	2.1	16.9
Physics	100.0	40.3	13.8	1.5	0.7	0.0	7.2	36.6
Other	100.0	0.0	0.0	5.4	0.0	2.7	2.7	89.2
Mathematics	100.0	40.6	23.6	7.3	1.4	2.2	2.3	22.6
Computer sciences	100.0	38.0	42.7	2.8	0.8	0.5	4.2	11.1
Environmental sciences	100.0	40.5	9.2	1.0	0.2	1.8	11.0	36.3
Atmospheric sciences	100.0	36.3	11.0	0.0	0.0	1.1	14.9	36.7
Earth sciences	100.0	54.7	4.4	0.3	0.0	1.7	10.8	28.1
Oceanography	100.0	28.5	16.3	1.5	0.4	1.3	6.4	45.6
Other	100.0	19.4	4.4	5.8	1.0	5.8	18.0	45.6
Life sciences	100.0	7.7	2.1	59.9	3.7	12.9	0.6	13.2
Agricultural sciences	100.0	5.3	2.2	0.9	0.4	55.8	0.9	34.5
Biological sciences	100.0	9.0	2.0	67.7	3.2	8.1	0.6	9.4
Medical sciences	100.0	2.2	2.6	74.9	7.2	2.9	0.1	10.1
Other	100.0	3.0	1.5	50.6	14.4	0.0	0.6	30.0
Psychology	100.0	7.2	4.4	56.1	10.1	0.4	1.3	20.5
Social sciences	100.0	17.8	2.1	9.8	2.4	24.5	3.3	40.1
Anthropology	100.0	23.7	6.2	27.8	2.1	1.0	0.0	39.2
Economics	100.0	9.7	0.6	1.2	1.2	52.2	0.0	35.2
Linguistics	100.0	58.1	4.7	20.9	7.0	0.0	0.0	9.3
Political science	100.0	25.2	0.9	1.9	1.9	0.0	0.0	70.1
Sociology	100.0	20.6	0.0	35.6	3.0	15.5	2.1	23.2
Other	100.0	19.0	4.3	2.6	3.4	9.4	9.9	51.4
Total engineering	100.0	29.3	29.1	4.4	0.9	1.4	8.3	26.6
Aeronautical/astronautical	100.0	11.6	32.0	0.4	0.4	0.0	36.2	19.4
Chemical	100.0	40.6	11.5	4.7	0.5	1.6	5.2	35.9
Civil	100.0	27.0	12.7	2.8	0.4	2.4	7.9	46.7
Electrical/electronics	100.0	30.3	45.0	1.7	1.1	0.4	5.1	16.5
Industrial	100.0	34.7	13.7	4.9	0.5	0.3	5.5	40.4
Mechanical	100.0	30.4	29.7	2.8	1.7	0.5	10.8	24.1
Materials	100.0	34.3	30.5	0.5	0.7	0.3	4.2	29.6
Other	100.0	21.6	20.8	20.3	0.5	5.8	4.9	26.1

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Graduate Students and Postdoctorates in Science and Engineering, special tabulations, 1997.

See figure 6-29 in Volume 1.

Appendix table 6-47.
Academic institutions reporting full-time S&E graduate students with a research assistantship as primary support mechanism, by primary source of support and type of institution: 1980–97

Primary source of support and institution type[a]	1980	1981	1982	1983	1984[b]	1985[b]	1986[b]	1987[b]	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Number of institutions responding to the survey of graduate students and postdoctorates in science and engineering																		
All sources																		
All institutions	621	610	596	598	401	401	402	402	594	598	603	601	599	596	595	594	594	593
Research and doctorate-granting	234	234	234	233	226	226	226	226	232	232	232	232	232	232	232	232	232	232
Other	387	376	362	365	175	175	176	176	362	366	371	369	367	364	363	362	362	361
Number of institutions reporting research assistantships																		
All sources																		
All institutions	400	425	408	413	332	324	318	320	412	415	425	413	426	435	421	414	420	428
Research and doctorate-granting	222	223	224	224	224	221	222	222	219	222	219	220	222	222	219	220	222	222
Other	178	202	184	189	111	107	104	105	188	194	203	191	207	213	202	194	198	206
Non-Federal sources																		
All institutions	371	403	383	390	321	310	307	306	396	399	404	394	410	418	404	403	403	407
Research and doctorate-granting	217	218	218	216	218	214	213	214	221	221	221	221	218	221	216	219	220	222
Other	154	185	165	174	103	96	94	92	175	178	183	173	192	197	188	184	183	185
Federal sources																		
All institutions	297	316	308	296	269	261	254	266	292	299	302	303	304	312	312	302	305	322
Research and doctorate-granting	207	213	210	209	210	204	197	200	209	205	203	205	205	206	209	205	205	208
Other	90	103	98	87	59	57	57	66	83	94	99	98	99	106	103	97	100	114
Percentage of institutions reporting research assistantships																		
All sources																		
All institutions	64.4	69.7	68.5	69.1	NA	NA	NA	NA	69.4	69.4	70.5	68.7	71.1	73.0	70.8	69.7	70.7	72.2
Research and doctorate-granting	94.9	95.3	95.7	96.1	NA	NA	NA	NA	96.6	95.3	95.7	95.7	94.4	95.7	94.4	94.8	95.7	95.7
Other	46.0	53.7	50.8	51.8	NA	NA	NA	NA	51.9	53.0	54.7	51.8	56.4	58.5	55.6	53.6	54.7	57.1
Non-Federal sources																		
All institutions	59.7	66.1	64.3	65.2	NA	NA	NA	NA	66.7	66.7	67.0	65.6	68.4	70.1	67.9	67.8	67.8	68.6
Research and doctorate-granting	92.7	93.2	93.2	92.7	NA	NA	NA	NA	95.3	95.3	95.3	95.3	94.0	95.3	93.1	94.4	94.8	95.7
Other	39.8	49.2	45.6	47.7	NA	NA	NA	NA	48.3	48.6	49.3	46.9	52.3	54.1	51.8	50.8	50.6	51.2
Federal sources																		
All institutions	47.8	51.8	51.7	49.5	NA	NA	NA	NA	49.2	50.0	50.1	50.4	50.8	52.3	52.4	50.8	51.3	54.3
Research and doctorate-granting	88.5	91.0	89.7	89.7	NA	NA	NA	NA	90.1	88.4	87.5	88.4	88.4	88.8	90.1	88.4	88.4	89.7
Other	23.3	27.4	27.1	23.8	NA	NA	NA	NA	22.9	25.7	26.7	26.6	27.0	29.1	28.4	26.8	27.6	31.6

[a]These are the institutional categories used by the Carnegie Foundation for the Advancement of Teaching. See "Characteristics of Higher Education Institutions" in chapter 4 for information on these categories. "Other" institutions are Carnegie-classified institutions except research and doctorate-granting institutions.

[b]Data for 1984 to 1987 are not comparable with earlier or later years because only a sample of master's-granting institutions rather than the entire population was included in the survey during these years.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Survey of Graduate Students and Postdoctorates in Science and Engineering, various years, special tabulations.

See page 6-38 in Volume 1.

Appendix table 6-48.
Broad and fine fields for publications output data

Broad field	Fine fields		
Clinical medicine	Addictive diseases	General & internal medicine	Pathology
	Allergy	Geriatrics	Pediatrics
	Anesthesiology	Hematology	Pharmacology
	Arthritis & rheumatism	Immunology	Pharmacy
	Cancer	Miscellaneous clinical	Psychiatry
	Cardiovascular system	Nephrology	Radiology & nuclear medicine
	Dentistry	Neurology & neurosurgery	Respiratory system
	Dermatology & venereal disease	Obstetrics & gynecology	Surgery
	Endocrinology	Ophthalmology	Tropical medicine
	Environmental & occupational health	Orthopedics	Urology
	Fertility	Otorhinolaryngology	Veterinary medicine
	Gastroenterology		
Biomedical research	Anatomy & morphology	Embryology	Miscellaneous biomedical research
	Biochemistry & molecular biology	Genetics & heredity	Nutrition & dietetics
	Biomedical engineering	General biomedical research	Parasitology
	Biophysics	Microbiology	Physiology
	Cell biology, cytology & histology	Microscopy	Virology
Biology	Agriculture & food science	Entomology	Marine and hydro-biology
	Botany	General biology	Miscellaneous biology
	Dairy & animal science	General zoology	Miscellaneous zoology
	Ecology		
Chemistry	Analytical chemistry	Inorganic & nuclear chemistry	Physical chemistry
	Applied chemistry	Organic chemistry	Polymers
	General chemistry		
Physics	Acoustics	Fluids & plasmas	Nuclear & particle physics
	Applied physics	General physics	Optics
	Chemical physics	Miscellaneous physics	Solid state physics
Earth and space sciences	Astronomy & astrophysics	Environmental science	Meteorology & atmospheric science
	Earth & planetary science	Geology	Oceanography & limnology
Engineering and technology	Aerospace technology	General engineering	Miscellaneous engineering & technology
	Chemical engineering	Industrial engineering	Nuclear technology
	Civil engineering	Materials science	Operations research & management
	Computers	Mechanical engineering	
	Electrical & electronics engineering	Metals & metallurgy	
Mathematics	Applied mathematics	Miscellaneous mathematics	Probability & statistics
	General mathematics		
Psychology	Behavioral & comparative psychology	Experimental psychology	Miscellaneous psychology
	Clinical psychology	General psychology	Psychoanalysis
	Developmental & child psychology	Human factors	Social psychology
Social sciences	Anthropology & archaeology	General social sciences	Political science & public administration
	Area studies	Geography & regional science	Science studies
	Criminology	International relations	Sociology
	Demography	Miscellaneous social sciences	
	Economics	Planning & urban studies	
Other partially covered fields: professional, health, and humanities	Communication	Miscellaneous professional fields	Social studies of medicine
	Education	Gerontology & aging	Speech/language pathology & audiology
	Information & library science	Health policy & services	History
	Law	Nursing	Linguistics & language
	Management & business	Public health	Philosophy
	Social work	Rehabilitation	

SOURCE: CHI Research, Inc., Science Indicators database.

Appendix table 6-49.
Distribution of U.S. scientific and technical articles, by sector and field: 1988–97

Years	Total science & engineering		Physics	Chemistry	Earth & space	Mathem-atics	Clinical medicine	Biomedical research	Biology	Engineering & technology	Psychology	Social sciences	Health & professional
	Number (average)		Percent in field										
All U.S. sectors													
1988–91	179,014	100.0	10.3	7.5	4.7	2.0	30.8	15.8	7.6	6.5	3.8	4.9	6.2
1992–94	179,218	100.0	10.4	7.6	5.1	1.8	30.9	16.5	6.9	6.8	3.5	4.6	5.9
1995–97	173,236	100.0	10.4	7.8	5.7	1.7	31.3	17.0	6.6	6.4	3.5	4.3	5.4
Academic institutions													
1988–91	128,876	100.0	9.1	7.6	4.2	2.6	29.6	16.5	8.0	5.3	4.7	5.7	6.8
1992–94	129,830	100.0	9.7	7.8	4.6	2.3	29.4	17.3	7.1	5.7	4.2	5.3	6.5
1995–97	126,458	100.0	10.0	8.0	5.1	2.2	29.5	17.6	6.8	5.5	4.2	4.9	6.1
Industry													
1988–91	15,053	100.0	21.1	14.8	4.0	0.9	18.0	10.3	2.9	19.6	0.8	1.7	5.9
1992–94	14,707	100.0	17.9	14.5	4.3	0.8	21.1	11.9	3.1	19.3	0.6	1.4	5.1
1995–97	13,221	100.0	14.5	14.2	4.6	0.6	24.3	13.1	3.3	18.5	0.7	1.5	4.7
Federal Government													
1988–91	14,305	100.0	7.1	5.0	8.5	0.5	35.4	17.3	13.7	5.5	1.3	3.1	2.6
1992–94	13,899	100.0	8.0	5.1	9.2	0.4	33.7	17.6	13.0	6.0	1.2	3.2	2.6
1995–97	12,975	100.0	7.9	5.4	10.4	0.4	33.5	17.7	12.6	5.8	1.2	2.7	2.5
Federally funded research and development centers—university administered													
1988–91	3,287	100.0	49.4	9.6	15.1	1.0	3.1	7.2	0.7	12.8	0.0	0.9	0.3
1992–94	3,135	100.0	48.7	8.5	16.7	0.9	3.2	6.7	0.8	13.3	0.1	0.9	0.2
1995–97	3,334	100.0	46.7	9.9	18.9	0.7	2.8	7.2	1.1	12.0	0.0	0.5	0.2
Federally funded research and development centers—industry administered													
1988–91	1,171	100.0	36.2	11.7	4.1	1.1	7.9	12.9	4.6	21.1	0.1	0.2	0.1
1992–94	1,093	100.0	32.6	12.6	4.5	1.1	8.2	14.1	3.6	23.1	0.0	0.1	0.2
1995–97	1,118	100.0	35.0	13.8	4.5	0.8	8.5	14.3	3.3	19.4	0.1	0.4	0.1
Federally funded research and development centers—nonprofit sector administered													
1988–91	389	100.0	27.6	13.8	8.8	1.3	4.8	9.3	3.3	19.1	1.2	6.2	4.8
1992–94	396	100.0	29.7	13.0	8.3	0.8	5.6	7.6	2.2	21.7	0.9	6.5	3.7
1995–97	453	100.0	24.3	19.3	9.8	0.4	8.9	9.6	1.7	16.4	0.6	5.0	4.1
Other government													
1988–91	2,029	100.0	0.3	1.8	6.3	0.1	49.1	12.9	11.2	1.3	4.4	2.5	10.1
1992–94	1,825	100.0	0.2	1.8	5.9	0.1	47.7	12.9	11.5	1.7	4.8	2.8	10.6
1995–97	1,608	100.0	0.4	1.5	6.9	0.2	47.6	13.3	12.0	1.8	4.5	2.7	9.2
Not-for-profit organizations													
1988–91	12,499	100.0	2.0	1.7	3.8	0.4	59.5	16.9	3.5	1.6	2.2	4.0	4.3
1992–94	12,736	100.0	1.8	2.0	3.6	0.4	59.8	17.4	3.2	1.5	2.0	4.1	4.1
1995–97	12,584	100.0	1.5	2.0	3.8	0.3	60.7	18.6	3.0	1.1	1.7	3.7	3.7
Unknown sector													
1988–91	1,406	100.0	3.2	2.9	3.6	0.7	39.8	6.2	6.3	6.6	9.6	6.6	14.6
1992–94	1,600	100.0	3.7	2.5	4.1	0.4	41.9	6.9	6.8	8.1	8.0	4.9	12.6
1995–97	1,486	100.0	4.1	2.6	4.7	0.5	42.2	7.9	5.6	7.3	6.9	5.6	12.7

NOTE: Table is based on fractional counts; for example, an article with two authors located in different U.S. sectors is recorded as half an article in each sector.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Science Citation Index; CHI Research, Inc., Science Indicators database; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See figure 6-31 in Volume 1.

Appendix table 6-50.
Distribution of U.S. scientific and technical articles, by field and sector: 1989–97
(Percentages)

Years	U.S. total	Academia	Industry	Federal Government	Nonprofit institutions	FFRDCs	State/local government	Unknown sector
Total science and engineering								
1989–91	100	72.1	8.4	7.9	7.0	2.7	1.1	0.8
1992–94	100	72.4	8.2	7.8	7.1	2.6	1.0	0.9
1995–97	100	73.0	7.6	7.5	7.3	2.8	0.9	0.9
Physics								
1989–91	100	64.1	17.1	5.6	1.4	11.6	0.0	0.3
1992–94	100	67.6	14.1	6.0	1.3	10.7	0.0	0.3
1995–97	100	70.7	10.7	5.7	1.0	11.5	0.0	0.3
Chemistry								
1989–91	100	72.6	16.3	5.2	1.5	3.7	0.3	0.3
1992–94	100	73.6	15.5	5.2	1.8	3.3	0.2	0.3
1995–97	100	74.5	13.9	5.1	1.8	4.2	0.2	0.3
Earth and space sciences								
1989–91	100	63.6	7.2	14.4	5.8	6.9	1.5	0.6
1992–94	100	65.6	7.0	13.9	5.0	6.6	1.2	0.7
1995–97	100	66.1	6.2	13.7	4.8	7.4	1.1	0.7
Mathematics								
1989–91	100	91.3	3.4	2.1	1.5	1.4	0.1	0.3
1992–94	100	91.4	3.6	1.8	1.5	1.4	0.1	0.2
1995–97	100	92.7	2.8	1.7	1.3	1.2	0.1	0.2
Clinical medicine								
1989–91	100	69.2	5.1	9.1	13.5	0.4	1.8	1.1
1992–94	100	69.0	5.6	8.5	13.8	0.4	1.6	1.2
1995–97	100	68.9	5.9	8.0	14.1	0.4	1.4	1.2
Biomedical research								
1989–91	100	75.6	5.5	8.7	7.5	1.5	0.9	0.3
1992–94	100	75.8	5.9	8.3	7.5	1.3	0.8	0.4
1995–97	100	75.7	5.9	7.8	8.0	1.5	0.7	0.4
Biology								
1989–91	100	75.9	3.2	14.5	3.3	0.6	1.7	0.7
1992–94	100	75.2	3.7	14.6	3.3	0.6	1.7	0.9
1995–97	100	75.4	3.8	14.3	3.3	0.7	1.7	0.7
Engineering and technology								
1989–91	100	59.1	25.1	6.8	1.7	6.3	0.2	0.8
1992–94	100	60.8	23.3	6.8	1.6	6.2	0.3	1.1
1995–97	100	62.7	21.8	6.8	1.3	6.2	0.3	1.0
Psychology								
1989–91	100	88.4	1.6	2.7	4.0	0.1	1.3	1.9
1992–94	100	88.1	1.5	2.7	4.1	0.1	1.4	2.0
1995–97	100	89.2	1.6	2.5	3.7	0.1	1.2	1.7
Social sciences								
1989–91	100	84.1	2.8	5.2	5.7	0.6	0.6	1.0
1992–94	100	83.4	2.5	5.4	6.5	0.7	0.6	1.0
1995–97	100	84.1	2.6	4.7	6.2	0.6	0.6	1.1
Health and professional fields								
1989–91	100	79.9	8.0	3.3	4.9	0.3	1.8	1.8
1992–94	100	80.6	7.1	3.4	5.0	0.2	1.8	1.9
1995–97	100	81.3	6.5	3.4	4.9	0.3	1.6	2.0

FFRDC= Federally Funded Research and Development Center

NOTES: Articles are assigned to fields based on journal field classifications developed by CHI Research, Inc. for journals included in the Institute for Scientific Information's Science and Social Science Citation Indexes (SCI, SSCI). Selected health science and professional journals are included in the SSCI because of their close ties to the social sciences or psychology.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Science Citation Index; CHI Research, Inc., Science Indicators database; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See figure 6-30 in Volume 1.

Appendix table 6-51.
Incidence of multiple corporate authorship of U.S. scientific and technical articles, by field: 1988–97

Years	Total U.S. articles							
	Total articles	One-author articles	Coauthored articles	U.S.-coauthored	Internationally coauthored	Total coauthored	U.S.-coauthored	Internationally coauthored
	Number (annual average)					Percent of total articles		
Total science and engineering								
1988–91	189,784	96,916	92,869	71,134	21,735	48.9	37.5	11.5
1992–94	193,519	91,066	102,453	73,713	28,740	52.9	38.1	14.9
1995–97	190,459	82,277	108,182	73,929	34,253	56.8	38.8	18.0
Physics								
1988–91	20,273	10,692	9,582	5,844	3,737	47.3	28.8	18.4
1992–94	21,357	9,753	11,605	6,323	5,282	54.3	29.6	24.7
1995–97	21,312	8,679	12,633	6,209	6,424	59.3	29.1	30.1
Chemistry								
1988–91	14,275	9,455	4,820	3,214	1,607	33.8	22.5	11.3
1992–94	14,798	9,093	5,705	3,554	2,151	38.6	24.0	14.5
1995–97	14,822	8,518	6,304	3,795	2,509	42.5	25.6	16.9
Earth and space sciences								
1988–91	9,300	4,419	4,881	3,073	1,807	52.5	33.0	19.4
1992–94	10,422	4,355	6,067	3,543	2,525	58.2	34.0	24.2
1995–97	11,478	4,231	7,247	3,946	3,301	63.1	34.4	28.8
Mathematics								
1988–91	4,037	2,338	1,699	865	834	42.1	21.4	20.6
1992–94	3,769	2,004	1,765	849	916	46.8	22.5	24.3
1995–97	3,419	1,724	1,695	780	916	49.6	22.8	26.8
Clinical medicine								
1988–91	57,768	22,369	35,399	30,095	5,304	61.3	52.1	9.2
1992–94	58,861	21,607	37,254	30,099	7,155	63.3	51.1	12.2
1995–97	58,535	19,648	38,887	30,103	8,784	66.4	51.4	15.0
Biomedical research								
1988–91	30,213	13,886	16,327	12,232	4,095	54.0	40.5	13.6
1992–94	32,249	13,286	18,963	13,486	5,477	58.8	41.8	17.0
1995–97	32,547	12,427	20,119	13,776	6,343	61.8	42.3	19.5
Biology								
1988–91	14,318	8,297	6,022	4,484	1,538	42.1	31.3	10.7
1992–94	13,184	7,119	6,064	4,331	1,733	46.0	32.9	13.1
1995–97	12,373	6,171	6,202	4,228	1,975	50.1	34.2	16.0
Engineering and technology								
1988–91	12,333	7,549	4,784	3,397	1,388	38.8	27.5	11.3
1992–94	13,110	7,438	5,672	3,869	1,803	43.3	29.5	13.8
1995–97	12,173	6,451	5,723	3,712	2,011	47.0	30.5	16.5
Psychology								
1988–91	6,987	4,312	2,675	2,295	380	38.3	32.9	5.4
1992–94	6,466	3,798	2,668	2,224	443	41.3	34.4	6.9
1995–97	6,284	3,545	2,739	2,180	559	43.6	34.7	8.9
Social sciences								
1988–91	9,043	6,266	2,776	2,145	631	30.7	23.7	7.0
1992–94	8,559	5,746	2,814	2,057	757	32.9	24.0	8.8
1995–97	7,774	4,998	2,776	1,974	801	35.7	25.4	10.3
Health and professional fields								
1988–91	11,240	7,334	3,905	3,490	415	34.7	31.1	3.7
1992–94	10,744	6,868	3,876	3,379	497	36.1	31.4	4.6
1995–97	9,742	5,886	3,856	3,226	630	39.6	33.1	6.5

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-51.
Incidence of multiple corporate authorship of U.S. scientific and technical articles, by field: 1988–97

Years	Total academic articles							
	Total articles	One-author articles	Coauthored articles	U.S.-coauthored	Internationally coauthored	Total coauthored	U.S.-coauthored	Internationally coauthored
	Number (annual average)					Percent of total articles		
Total science and engineering								
1988–91	151,186	70,446	80,740	63,763	16,977	53.4	42.2	11.2
1992–94	155,706	67,163	88,543	65,901	22,642	56.9	42.3	14.5
1995–97	154,999	61,725	93,275	66,294	26,980	60.2	42.8	17.4
Physics								
1988–91	14,463	6,495	7,969	5,140	2,828	55.1	35.5	19.6
1992–94	16,224	6,436	9,788	5,605	4,183	60.3	34.6	25.8
1995–97	16,894	6,139	10,755	5,587	5,168	63.7	33.1	30.6
Chemistry								
1988–91	10,938	6,806	4,133	2,841	1,292	37.8	26.0	11.8
1992–94	11,601	6,761	4,839	3,127	1,713	41.7	27.0	14.8
1995–97	11,818	6,456	5,362	3,362	2,000	45.4	28.5	16.9
Earth and space sciences								
1988–91	6,781	2,851	3,931	2,623	1,307	58.0	38.7	19.3
1992–94	7,856	2,950	4,906	3,014	1,892	62.5	38.4	24.1
1995–97	8,828	2,946	5,882	3,394	2,488	66.6	38.4	28.2
Mathematics								
1988–91	3,783	2,151	1,632	847	785	43.1	22.4	20.8
1992–94	3,563	1,863	1,700	829	871	47.7	23.3	24.4
1995–97	3,271	1,620	1,650	767	883	50.5	23.5	27.0
Clinical medicine								
1988–91	46,627	15,883	30,744	26,738	4,006	65.9	57.3	8.6
1992–94	47,358	15,321	32,037	26,610	5,427	67.6	56.2	11.5
1995–97	47,102	13,913	33,188	26,613	6,575	70.5	56.5	14.0
Biomedical research								
1988–91	24,946	10,542	14,404	11,207	3,197	57.7	44.9	12.8
1992–94	26,797	10,115	16,682	12,411	4,272	62.3	46.3	15.9
1995–97	27,085	9,467	17,619	12,679	4,939	65.0	46.8	18.2
Biology								
1988–91	11,726	6,351	5,376	4,128	1,248	45.8	35.2	10.6
1992–94	10,767	5,399	5,368	3,936	1,432	49.9	36.6	13.3
1995–97	10,192	4,717	5,475	3,869	1,606	53.7	38.0	15.8
Engineering and technology								
1988–91	8,100	4,369	3,731	2,705	1,026	46.1	33.4	12.7
1992–94	8,977	4,557	4,420	3,099	1,321	49.2	34.5	14.7
1995–97	8,685	4,158	4,527	3,018	1,509	52.1	34.7	17.4
Psychology								
1988–91	6,505	3,913	2,593	2,240	353	39.9	34.4	5.4
1992–94	6,007	3,428	2,579	2,166	413	42.9	36.1	6.9
1995–97	5,891	3,234	2,657	2,132	525	45.1	36.2	8.9
Social sciences								
1988–91	7,869	5,264	2,605	2,050	555	33.1	26.0	7.1
1992–94	7,434	4,809	2,625	1,959	666	35.3	26.3	9.0
1995–97	6,833	4,255	2,578	1,877	702	37.7	27.5	10.3
Health and professional fields								
1988–91	9,448	5,824	3,624	3,243	381	38.4	34.3	4.0
1992–94	9,123	5,524	3,599	3,146	453	39.5	34.5	5.0
1995–97	8,401	4,820	3,581	2,996	585	42.6	35.7	7.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-51.
Incidence of multiple corporate authorship of U.S. scientific and technical articles, by field: 1988–97

Years	U.S. industry articles							
	Total articles	One-author articles	Coauthored articles	U.S.-coauthored	Internationally coauthored	Total coauthored	U.S.-coauthored	Internationally coauthored
	Number (annual average)					Percent of total articles		
Total science and engineering								
1988–91	20,563	9,692	10,871	8,893	1,978	52.9	43.2	9.6
1992–94	21,536	8,403	13,134	10,225	2,909	61.0	47.5	13.5
1995–97	20,799	6,753	14,046	10,478	3,568	67.5	50.4	17.2
Physics								
1988–91	4,167	2,182	1,985	1,520	465	47.6	36.5	11.2
1992–94	3,773	1,559	2,214	1,601	613	58.7	42.4	16.2
1995–97	3,051	971	2,080	1,446	634	68.2	47.4	20.8
Chemistry								
1988–91	2,684	1,697	987	771	216	36.8	28.7	8.1
1992–94	2,708	1,476	1,231	914	317	45.5	33.8	11.7
1995–97	2,513	1,212	1,301	920	381	51.8	36.6	15.2
Earth and space sciences								
1988–91	960	308	652	528	124	67.9	55.0	12.9
1992–94	1,072	286	786	601	185	73.3	56.1	17.3
1995–97	1,118	215	903	660	243	80.8	59.0	21.8
Mathematics								
1988–91	197	73	124	94	30	63.0	47.8	15.2
1992–94	197	54	143	105	37	72.5	53.6	19.0
1995–97	143	36	107	81	26	74.7	56.7	17.9
Clinical medicine								
1988–91	4,297	1,410	2,887	2,423	464	67.2	56.4	10.8
1992–94	5,217	1,440	3,776	3,000	777	72.4	57.5	14.9
1995–97	5,826	1,308	4,518	3,374	1,144	77.6	57.9	19.6
Biomedical research								
1988–91	2,352	858	1,495	1,180	315	63.5	50.2	13.4
1992–94	2,789	862	1,927	1,430	496	69.1	51.3	17.8
1995–97	2,882	823	2,059	1,460	599	71.4	50.7	20.8
Biology								
1988–91	656	239	417	358	59	63.5	54.6	9.0
1992–94	710	239	471	398	73	66.4	56.1	10.3
1995–97	710	209	500	400	100	70.5	56.4	14.1
Engineering and technology								
1988–91	3,662	2,006	1,656	1,390	266	45.2	38.0	7.3
1992–94	3,718	1,752	1,966	1,607	359	52.9	43.2	9.7
1995–97	3,346	1,370	1,976	1,588	387	59.1	47.5	11.6
Psychology								
1988–91	185	60	124	116	9	67.3	62.7	4.6
1992–94	153	47	106	94	12	69.1	61.1	8.0
1995–97	161	54	107	94	13	66.7	58.6	8.1
Social sciences								
1988–91	318	192	127	115	12	39.7	36.1	3.6
1992–94	268	147	120	110	10	45.0	41.1	3.9
1995–97	264	129	135	118	17	51.1	44.8	6.3
Health and professional fields								
1988–91	1,086	669	417	399	19	38.4	36.7	1.7
1992–94	933	540	393	364	28	42.1	39.1	3.0
1995–97	786	427	360	336	24	45.7	42.7	3.1

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-51.
Incidence of multiple corporate authorship of U.S. scientific and technical articles, by field: 1988–97

Years	U.S. Federal Government articles							
	Total articles	One-author articles	Coauthored articles	U.S.-coauthored	Internationally coauthored	Total coauthored	U.S.-coauthored	Internationally coauthored
	Number (annual average)					Percent of total articles		
Total science and engineering								
1988–91	22,105	6,999	15,106	12,695	2,411	68.3	57.4	10.9
1992–94	22,487	6,439	16,048	12,865	3,183	71.4	57.2	14.2
1995–97	22,100	5,492	16,608	12,784	3,824	75.1	57.8	17.3
Physics								
1988–91	1,496	599	897	701	196	59.9	46.8	13.1
1992–94	1,760	597	1,163	871	292	66.1	49.5	16.6
1995–97	1,695	509	1,185	857	329	69.9	50.6	19.4
Chemistry								
1988–91	944	473	471	373	98	49.9	39.5	10.4
1992–94	980	435	546	414	132	55.7	42.2	13.4
1995–97	988	412	576	431	144	58.3	43.7	14.6
Earth and space sciences								
1988–91	1,877	632	1,245	933	312	66.3	49.7	16.6
1992–94	2,141	558	1,582	1,101	481	73.9	51.4	22.5
1995–97	2,437	516	1,921	1,267	654	78.8	52.0	26.8
Mathematics								
1988–91	111	48	63	51	12	56.6	45.7	10.9
1992–94	92	31	61	48	13	66.4	52.3	14.1
1995–97	75	27	48	39	10	64.2	51.3	12.8
Clinical medicine								
1988–91	8,695	1,736	6,959	6,098	861	80.0	70.1	9.9
1992–94	8,402	1,572	6,831	5,730	1,101	81.3	68.2	13.1
1995–97	8,217	1,326	6,891	5,537	1,354	83.9	67.4	16.5
Biomedical research								
1988–91	3,887	1,167	2,720	2,151	569	70.0	55.3	14.6
1992–94	4,048	1,094	2,954	2,204	750	73.0	54.5	18.5
1995–97	3,955	947	3,008	2,177	832	76.1	55.0	21.0
Biology								
1988–91	2,630	1,213	1,417	1,190	227	53.9	45.2	8.6
1992–94	2,503	1,053	1,450	1,201	248	57.9	48.0	9.9
1995–97	2,371	885	1,485	1,179	306	62.7	49.7	12.9
Engineering and technology								
1988–91	1,086	484	602	525	78	55.4	48.3	7.1
1992–94	1,220	464	757	653	104	62.0	53.5	8.5
1995–97	1,148	392	756	636	119	65.8	55.4	10.4
Psychology								
1988–91	311	88	223	208	15	71.6	66.9	4.7
1992–94	284	81	204	186	17	71.6	65.5	6.1
1995–97	272	66	206	183	24	75.9	67.2	8.7
Social sciences								
1988–91	572	325	247	218	29	43.2	38.2	5.0
1992–94	558	326	232	206	26	41.6	37.0	4.6
1995–97	466	233	233	202	31	50.0	43.4	6.6
Health and professional fields								
1988–91	499	234	264	250	15	53.0	50.1	3.0
1992–94	498	229	269	250	19	54.0	50.2	3.8
1995–97	475	178	297	276	21	62.5	58.0	4.4

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-51.
Incidence of multiple corporate authorship of U.S. scientific and technical articles, by field: 1988–97

Years	U.S. university-administered FFRDC articles							
	Total articles	One-author articles	Coauthored articles	U.S.-coauthored	Internationally coauthored	Total coauthored	U.S.-coauthored	Internationally coauthored
	Number (annual average)					Percent of total articles		
Total science and engineering								
1988–91	5,192	1,807	3,386	2,301	1,085	65.2	44.3	20.9
1992–94	5,426	1,532	3,894	2,406	1,489	71.8	44.3	27.4
1995–97	6,093	1,493	4,600	2,556	2,043	75.5	42.0	33.5
Physics								
1988–91	2,582	896	1,686	1,067	620	65.3	41.3	24.0
1992–94	2,677	756	1,921	1,056	865	71.8	39.4	32.3
1995–97	2,877	696	2,181	1,071	1,110	75.8	37.2	38.6
Chemistry								
1988–91	463	168	295	229	66	63.6	49.4	14.3
1992–94	431	124	307	224	83	71.2	51.9	19.3
1995–97	543	142	402	282	120	73.9	51.9	22.0
Earth and space sciences								
1988–91	865	245	620	404	216	71.7	46.7	24.9
1992–94	988	231	757	454	303	76.6	46.0	30.7
1995–97	1,271	258	1,013	529	484	79.7	41.6	38.1
Mathematics								
1988–91	52	19	33	25	8	63.6	48.1	15.5
1992–94	45	17	28	21	7	62.5	46.3	16.2
1995–97	40	13	27	21	6	68.3	53.3	15.0
Clinical medicine								
1988–91	180	47	134	108	26	74.2	59.8	14.4
1992–94	187	40	147	116	31	78.6	62.1	16.4
1995–97	188	33	155	119	36	82.4	63.2	19.2
Biomedical research								
1988–91	378	125	253	187	67	67.0	49.4	17.6
1992–94	387	81	306	219	87	79.1	56.7	22.4
1995–97	462	98	364	225	139	78.7	48.7	30.0
Biology								
1988–91	33	14	20	16	4	59.4	48.1	11.3
1992–94	44	13	31	26	5	70.2	58.8	11.5
1995–97	64	15	49	32	17	77.1	50.5	26.6
Engineering and technology								
1988–91	583	266	317	243	74	54.4	41.7	12.7
1992–94	620	246	374	269	105	60.3	43.4	16.9
1995–97	614	223	390	264	127	63.6	43.0	20.6
Psychology								
1988–91	3	0	2	2	0	90.0	80.0	10.0
1992–94	4	1	3	3	0	75.0	66.7	8.3
1995–97	2	1	1	1	0	50.0	33.3	16.7
Social sciences								
1988–91	39	20	18	14	4	47.4	36.4	11.0
1992–94	34	19	15	13	2	44.7	38.8	5.8
1995–97	24	10	14	11	4	58.9	43.8	15.1
Health and professional fields								
1988–91	15	8	8	8	0	50.8	49.2	1.6
1992–94	9	4	5	5	1	57.1	50.0	7.1
1995–97	8	5	3	2	1	37.5	29.2	8.3

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-51.
Incidence of multiple corporate authorship of U.S. scientific and technical articles, by field: 1988–97

Years	Total articles	One-author articles	Coauthored articles	U.S.-coauthored	Internationally coauthored	Total coauthored	U.S.-coauthored	Internationally coauthored
	U.S. industry-administered FFRDC articles							
	Number (annual average)					Percent of total articles		
Total science and engineering								
1988–91	1,743	690	1,054	815	239	60.4	46.7	13.7
1992–94	1,787	550	1,237	903	333	69.2	50.6	18.7
1995–97	1,964	502	1,462	1,028	434	74.4	52.3	22.1
Physics								
1988–91	645	268	377	260	117	58.5	40.4	18.1
1992–94	619	179	440	284	156	71.0	45.9	25.2
1995–97	723	177	545	343	202	75.5	47.5	28.0
Chemistry								
1988–91	194	83	111	99	12	57.0	50.8	6.2
1992–94	212	73	139	123	16	65.5	58.0	7.6
1995–97	247	78	169	134	35	68.4	54.2	14.2
Earth and space sciences								
1988–91	70	29	40	34	6	57.9	48.9	9.0
1992–94	73	28	45	38	7	61.5	52.3	9.2
1995–97	83	24	58	48	11	70.6	57.7	12.9
Mathematics								
1988–91	18	9	9	7	2	49.3	38.0	11.3
1992–94	18	8	10	8	2	54.7	45.3	9.4
1995–97	14	5	9	8	2	66.7	54.8	11.9
Clinical medicine								
1988–91	151	32	118	97	22	78.6	64.1	14.5
1992–94	163	22	141	103	38	86.3	62.9	23.5
1995–97	188	17	171	118	53	91.0	62.8	28.1
Biomedical research								
1988–91	249	64	185	147	38	74.4	59.1	15.4
1992–94	268	59	209	148	62	78.0	55.0	23.0
1995–97	296	62	234	169	65	79.1	57.2	22.0
Biology								
1988–91	79	35	45	39	6	56.3	49.4	7.0
1992–94	68	19	49	42	7	72.2	62.0	10.2
1995–97	62	18	45	37	7	71.7	59.9	11.8
Engineering and technology								
1988–91	334	168	166	129	37	49.7	38.7	10.9
1992–94	360	159	201	155	46	55.8	43.0	12.8
1995–97	344	118	226	168	58	65.8	48.8	17.0
Psychology								
1988–91	2	0	2	2	0	88.9	77.8	11.1
1992–94	1	0	1	1	0	100.0	100.0	0.0
1995–97	1	1	0	0	0	0.0	0.0	0.0
Social sciences								
1988–91	3	1	2	2	0	54.5	54.5	0.0
1992–94	2	1	2	2	0	71.4	71.4	0.0
1995–97	6	2	4	3	1	61.1	50.0	11.1
Health and professional fields								
1988–91	1	1	0	0	0	33.3	33.3	0.0
1992–94	2	1	1	1	0	33.3	33.3	0.0
1995–97	1	1	0	0	0	33.3	33.3	0.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-51.
Incidence of multiple corporate authorship of U.S. scientific and technical articles, by field: 1988–97

Years	Total articles	One-author articles	Coauthored articles	U.S.-coauthored	Internationally coauthored	Total coauthored	U.S.-coauthored	Internationally coauthored
	U.S. nonprofit-administered FFRDC articles							
	Number (annual average)					Percent of total articles		
Total science and engineering								
1988–91	548	271	277	227	50	50.5	41.5	9.0
1992–94	604	250	354	271	83	58.6	44.9	13.7
1995–97	711	278	433	329	104	60.9	46.2	14.7
Physics								
1988–91	143	79	65	49	16	45.0	34.2	10.8
1992–94	173	80	93	65	28	53.8	37.5	16.3
1995–97	162	74	88	57	31	54.2	34.9	19.3
Chemistry								
1988–91	66	43	23	18	6	35.4	27.0	8.4
1992–94	68	37	31	23	8	45.9	34.1	11.7
1995–97	117	61	57	43	13	48.3	36.9	11.4
Earth and space sciences								
1988–91	57	21	36	27	9	63.2	47.4	15.8
1992–94	61	17	44	34	10	72.5	56.6	15.9
1995–97	81	24	57	36	21	70.4	44.9	25.5
Mathematics								
1988–91	8	3	4	4	1	56.7	50.0	6.7
1992–94	4	2	2	2	0	53.8	53.8	0.0
1995–97	3	1	2	2	0	77.8	66.7	11.1
Clinical medicine								
1988–91	39	7	32	29	3	82.6	74.8	7.7
1992–94	42	11	31	29	2	73.0	68.3	4.8
1995–97	88	17	70	61	9	80.2	70.0	10.3
Biomedical research								
1988–91	50	27	23	19	5	46.7	37.2	9.5
1992–94	51	16	35	26	9	68.8	50.6	18.2
1995–97	66	27	39	34	5	59.4	51.3	8.1
Biology								
1988–91	18	9	9	8	1	50.0	47.1	2.9
1992–94	14	5	9	9	0	66.7	64.3	2.4
1995–97	11	5	6	5	2	55.9	41.2	14.7
Engineering and technology								
1988–91	101	50	51	43	9	50.6	42.0	8.6
1992–94	125	55	71	49	22	56.4	39.1	17.3
1995–97	109	46	63	48	16	57.9	43.6	14.3
Psychology								
1988–91	7	3	4	4	0	57.7	53.8	3.8
1992–94	7	2	5	5	0	75.0	70.0	5.0
1995–97	5	1	4	3	1	80.0	66.7	13.3
Social sciences								
1988–91	32	18	14	13	1	43.3	39.4	3.9
1992–94	36	17	19	16	3	53.3	44.9	8.4
1995–97	33	14	20	17	3	59.0	50.0	9.0
Health and professional fields								
1988–91	29	13	16	15	1	55.3	53.5	1.8
1992–94	23	9	13	13	0	58.8	57.4	1.5
1995–97	35	9	26	23	3	75.2	65.7	9.5

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-51.
Incidence of multiple corporate authorship of U.S. scientific and technical articles, by field: 1988–97

Years	Total articles	One-author articles	Coauthored articles	U.S. state and local government articles: U.S.-coauthored	U.S. state and local government articles: Internationally coauthored	U.S. state and local government articles: Total coauthored	U.S. state and local government articles: U.S.-coauthored	U.S. state and local government articles: Internationaly coauthored
	Number (annual average)					Percent of total articles		
Total science and engineering								
1988–91	3,588	842	2,747	2,528	219	76.5	70.5	6.1
1992–94	3,410	723	2,687	2,405	282	78.8	70.5	8.3
1995–97	3,139	592	2,547	2,244	303	81.2	71.5	9.7
Physics								
1988–91	8	3	6	5	1	66.7	54.5	12.1
1992–94	6	1	5	4	1	82.4	70.6	11.8
1995–97	14	0	14	13	1	100.0	90.5	9.5
Chemistry								
1988–91	52	23	30	27	2	56.7	52.4	4.3
1992–94	51	19	32	25	6	62.5	50.0	12.5
1995–97	42	11	31	28	3	73.8	65.9	7.9
Earth and space sciences								
1988–91	193	71	122	111	11	63.2	57.6	5.6
1992–94	180	51	129	116	12	71.6	64.7	6.9
1995–97	197	48	149	131	18	75.8	66.6	9.2
Mathematics								
1988–91	4	1	3	2	1	76.5	52.9	23.5
1992–94	4	1	3	2	0	66.7	58.3	8.3
1995–97	4	2	2	2	0	54.5	45.5	9.1
Clinical medicine								
1988–91	1,945	296	1,649	1,532	117	84.8	78.8	6.0
1992–94	1,822	245	1,577	1,428	148	86.5	78.4	8.1
1995–97	1,661	211	1,450	1,293	157	87.3	77.8	9.5
Biomedical research								
1988–91	460	121	339	288	51	73.8	62.6	11.1
1992–94	433	103	330	268	62	76.3	61.9	14.4
1995–97	417	83	334	259	75	80.2	62.2	17.9
Biology								
1988–91	346	122	224	203	21	64.8	58.7	6.1
1992–94	339	102	237	211	26	70.0	62.4	7.6
1995–97	325	87	239	210	29	73.4	64.5	8.8
Engineering and technology								
1988–91	44	15	29	26	3	66.7	60.3	6.3
1992–94	56	13	43	35	8	76.9	62.1	14.8
1995–97	51	11	40	36	4	78.4	70.6	7.8
Psychology								
1988–91	161	38	123	117	6	76.4	72.8	3.6
1992–94	153	44	109	100	8	71.0	65.6	5.4
1995–97	126	36	90	85	6	71.7	67.2	4.5
Social sciences								
1988–91	77	31	46	45	2	59.9	57.6	2.3
1992–94	77	29	48	47	2	62.8	60.6	2.2
1995–97	67	25	42	39	3	63.0	58.5	4.5
Health and professional fields								
1988–91	298	122	176	171	5	59.1	57.6	1.5
1992–94	290	115	175	167	8	60.3	57.6	2.6
1995–97	236	80	156	149	7	66.2	63.1	3.1

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-51.
Incidence of multiple corporate authorship of U.S. scientific and technical articles, by field: 1988–97

Years	Total articles	One-author articles	Coauthored articles	U.S.-coauthored	Internationally coauthored	Total coauthored	U.S.-coauthored	Internationally coauthored
	U.S. nonprofit organization articles							
	Number (annual average)					Percent of total articles		
Total science and engineering								
1988–91	19,855	5,457	14,398	12,352	2,047	72.5	62.2	10.3
1992–94	20,916	5,244	15,672	12,879	2,793	74.9	61.6	13.4
1995–97	21,353	4,783	16,571	13,205	3,366	77.6	61.8	15.8
Physics								
1988–91	397	148	250	176	74	62.9	44.4	18.5
1992–94	402	117	285	180	104	70.8	44.9	26.0
1995–97	337	86	251	159	92	74.5	47.2	27.2
Chemistry								
1988–91	293	134	159	121	38	54.2	41.2	13.0
1992–94	360	148	213	163	50	59.0	45.2	13.8
1995–97	358	131	227	175	52	63.5	49.0	14.5
Earth and space sciences								
1988–91	846	239	608	352	256	71.8	41.5	30.3
1992–94	878	206	672	384	288	76.5	43.7	32.8
1995–97	999	175	825	438	386	82.5	43.9	38.7
Mathematics								
1988–91	83	29	54	35	19	65.2	42.1	23.0
1992–94	82	25	57	38	19	69.2	45.7	23.5
1995–97	62	18	45	34	10	71.7	55.1	16.6
Clinical medicine								
1988–91	11,864	2,734	9,130	8,224	906	77.0	69.3	7.6
1992–94	12,476	2,690	9,786	8,483	1,302	78.4	68.0	10.4
1995–97	12,795	2,597	10,198	8,559	1,639	79.7	66.9	12.8
Biomedical research								
1988–91	3,528	950	2,578	2,074	504	73.1	58.8	14.3
1992–94	3,865	920	2,945	2,225	720	76.2	57.6	18.6
1995–97	4,180	876	3,304	2,439	865	79.0	58.3	20.7
Biology								
1988–91	646	271	375	270	105	58.0	41.8	16.2
1992–94	631	236	395	282	113	62.6	44.7	17.9
1995–97	613	196	417	289	128	68.0	47.2	20.8
Engineering and technology								
1988–91	297	128	169	138	31	56.9	46.6	10.3
1992–94	299	112	187	146	42	62.7	48.7	13.9
1995–97	231	71	159	126	33	69.1	54.6	14.5
Psychology								
1988–91	445	138	307	285	22	69.0	64.0	4.9
1992–94	432	122	310	281	28	71.7	65.1	6.6
1995–97	382	100	282	256	26	73.9	67.1	6.8
Social sciences								
1988–91	686	347	339	269	71	49.5	39.2	10.3
1992–94	736	346	389	290	100	52.9	39.4	13.5
1995–97	682	276	405	306	100	59.5	44.8	14.6
Health and professional fields								
1988–91	773	341	431	409	23	55.8	52.9	2.9
1992–94	755	321	434	407	27	57.5	53.9	3.5
1995–97	714	256	457	423	34	64.1	59.3	4.8

NOTES: Coauthorships are based on authors' corporate addresses. Sectoral tables do not add to totals because articles are counted in each sector where there is an author.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Science Citation Index; CHI Research, Inc., Science Indicators database; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See page 6-44 in Volume 1.

Appendix table 6-52.
Patterns of cross-sectoral coauthorship of U.S. scientific and technical articles, by sector and field: 1988–91 and 1995–97

Years	Articles (number)	Percent of academic cross-sectoral coauthorships with: Total	Industry	Federal Govt.	University FFRDC	Industry FFRDC	Nonprofit FFRDC	Other govt.	Nonprofit	Articles (number)	Percent of industry cross-sectoral coauthorships with: Total	Academia	Federal Govt.	University FFRDC	Industry FFRDC	Nonprofit FFRDC	Other govt.	Nonprofit
Total science and engineering																		
1988–91	33,260	100	20	32	7	2	1	7	32	9,762	100	68	14	3	2	1	2	10
1995–97	38,532	100	23	30	8	2	1	5	31	13,087	100	66	14	3	2	0	2	12
Physics																		
1988–91	3,290	100	35	17	34	8	1	0	5	1,633	100	71	12	11	3	1	0	2
1995–97	4,070	100	31	19	34	9	1	0	4	1,865	100	68	14	11	5	1	0	1
Chemistry																		
1988–91	1,256	100	46	21	16	7	1	2	8	732	100	79	12	3	2	1	1	3
1995–97	1,679	100	45	20	17	8	2	2	8	938	100	80	11	4	2	1	0	2
Earth and space sciences																		
1988–91	2,044	100	18	37	20	1	1	4	18	713	100	52	30	7	1	1	3	6
1995–97	3,144	100	17	39	21	1	1	3	17	1,036	100	51	31	7	1	1	3	6
Mathematics																		
1988–91	215	100	43	22	11	4	2	1	17	104	100	88	6	2	0	0	0	4
1995–97	191	100	46	19	11	4	1	1	19	96	100	91	4	1	1	0	0	2
Clinical medicine																		
1988–91	15,499	100	12	34	1	0	0	9	44	2,951	100	63	14	0	1	0	3	19
1995–97	16,851	100	17	30	1	0	0	7	44	4,610	100	62	13	0	1	0	3	21
Biomedical research																		
1988–91	5,296	100	17	35	3	2	0	5	37	1,390	100	67	15	1	2	0	2	13
1995–97	6,426	100	20	32	4	2	0	4	38	1,906	100	67	13	1	2	0	2	15
Biology																		
1988–91	1,753	100	17	56	1	2	0	9	14	400	100	74	18	0	1	0	3	3
1995–97	1,880	100	18	54	2	2	0	9	15	498	100	70	21	1	0	0	4	5
Engineering and technology																		
1988–91	1,673	100	54	21	11	5	1	1	5	1,218	100	75	13	4	3	1	1	4
1995–97	2,102	100	55	22	10	6	1	1	4	1,571	100	74	14	4	3	1	1	3
Psychology																		
1988–91	691	100	15	29	0	0	0	16	39	126	100	80	7	0	0	0	4	9
1995–97	601	100	15	29	0	0	1	13	42	113	100	80	9	0	0	0	3	7
Social sciences																		
1988–91	591	100	15	30	2	0	2	7	44	122	100	74	13	1	0	0	2	10
1995–97	627	100	15	27	1	0	2	6	48	124	100	75	10	1	0	1	3	10
Health and professional fields																		
1988–91	954	100	31	19	1	0	1	14	35	374	100	78	7	0	0	1	2	12
1995–97	962	100	26	22	0	0	2	12	37	330	100	75	8	0	0	0	4	12

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-52.

Patterns of cross-sectoral coauthorship of U.S. scientific and technical articles, by sector and field: 1988–91 and 1995–97

Years	Articles (number)	Percent of Federal Government cross-sectoral coauthorships with: Total	Academia	Industry	University FFRDC	Industry FFRDC	Nonprofit FFRDC	Other govt.	Nonprofit	Articles (number)	Percent of academic FFRDCs' cross-sectoral coauthorships with: Total	Academia	Industry	Federal Govt.	Industry FFRDC	Nonprofit FFRDC	Other govt.	Nonprofit
Total science and engineering																		
1988–91	14,145	100	75	10	2	1	0	3	9	3,122	100	72	11	8	3	1	0	4
1995–97	16,251	100	71	12	3	1	0	3	10	4,236	100	71	10	10	3	1	0	5
Physics																		
1988–91	867	100	63	23	8	2	1	0	3	1,449	100	77	12	5	5	0	0	1
1995–97	1,165	100	66	22	8	2	0	0	2	1,824	100	77	11	5	5	0	0	1
Chemistry																		
1988–91	386	100	68	22	2	1	1	1	4	251	100	82	10	4	3	0	0	1
1995–97	488	100	69	22	3	2	1	0	3	344	100	81	10	4	3	1	0	1
Earth and space sciences																		
1988–91	1,219	100	62	18	9	1	1	2	8	650	100	63	7	18	0	1	0	10
1995–97	1,989	100	62	16	11	0	1	1	8	1,078	100	62	7	21	0	1	0	9
Mathematics																		
1988–91	56	100	83	10	3	0	0	0	3	29	100	84	6	5	2	1	0	2
1995–97	45	100	79	9	2	0	0	1	9	23	100	89	4	4	3	0	0	0
Clinical medicine																		
1988–91	6,784	100	78	6	0	1	0	4	12	150	100	67	4	12	2	1	3	12
1995–97	7,088	100	72	8	0	1	0	4	14	174	100	66	7	11	2	0	2	12
Biomedical research																		
1988–91	2,400	100	76	9	1	2	0	2	9	256	100	70	8	10	2	1	1	8
1995–97	2,735	100	76	9	2	2	0	2	10	375	100	67	7	11	1	1	1	11
Biology																		
1988–91	1,158	100	85	6	0	1	0	4	4	20	100	73	8	11	0	3	1	5
1995–97	1,246	100	81	8	1	1	0	5	5	45	100	70	6	17	1	0	1	4
Engineering and technology																		
1988–91	559	100	64	27	3	2	1	0	3	290	100	65	17	6	7	1	0	3
1995–97	743	100	61	29	4	2	1	0	3	356	100	62	19	8	8	2	0	2
Psychology																		
1988–91	231	100	87	4	0	0	0	4	5	2	100	NA	NA	NA	NA	NA	NA	NA
1995–97	211	100	83	5	0	0	0	4	8	1	100	NA	NA	NA	NA	NA	NA	NA
Social sciences																		
1988–91	225	100	80	7	1	0	1	2	9	16	100	76	5	10	0	2	0	8
1995–97	226	100	76	6	1	0	0	2	16	12	100	66	9	14	0	6	0	6
Health and professional fields																		
1988–91	260	100	69	10	0	0	0	9	12	9	100	NA	NA	NA	NA	NA	NA	NA
1995–97	315	100	68	8	0	0	2	8	13	3	100	NA	NA	NA	NA	NA	NA	NA

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-52.

Patterns of cross-sectoral coauthorship of U.S. scientific and technical articles, by sector and field: 1988–91 and 1995–97

Years	Articles (number)	Percent of industry FFRDC's cross-sectoral coauthorships with: Total	Academia	Industry	Federal Govt.	University FFRDC	Nonprofit FFRDC	Other govt.	Nonprofit	Articles (number)	Percent of nonprofit FFRDC's cross-sectoral coauthorships with: Total	Academia	Industry	Federal Govt.	University FFRDC	Industry FFRDC	Other govt.	Nonprofit
Total science and engineering																		
1988–91	1,080	100	58	15	14	10	1	0	3	317	100	56	16	12	6	3	1	6
1995–97	1,580	100	59	15	12	9	1	0	4	488	100	60	11	12	6	3	1	6
Physics																		
1988–91	395	100	64	14	5	17	0	0	1	66	100	58	23	8	6	2	0	3
1995–97	600	100	64	15	4	15	0	0	1	87	100	66	15	5	9	3	1	1
Chemistry																		
1988–91	110	100	74	13	5	6	1	0	1	23	100	57	17	14	3	4	1	3
1995–97	171	100	74	12	6	6	1	0	2	51	100	71	10	6	8	3	0	3
Earth and space sciences																		
1988–91	42	100	55	11	19	8	2	1	4	51	100	49	13	21	10	1	0	6
1995–97	59	100	70	10	13	4	1	1	0	74	100	50	11	18	12	1	0	8
Mathematics																		
1988–91	9	100	NA	NA	NA	NA	NA	NA	NA	5	100	NA	NA	NA	NA	NA	NA	NA
1995–97	9	100	NA	NA	NA	NA	NA	NA	NA	2	100	NA	NA	NA	NA	NA	NA	NA
Clinical medicine																		
1988–91	123	100	35	18	34	2	0	1	9	45	100	51	14	16	4	0	2	14
1995–97	176	100	40	19	30	2	0	0	9	99	100	59	6	20	0	0	3	11
Biomedical research																		
1988–91	195	100	45	14	30	2	1	0	9	28	100	62	8	10	9	4	1	6
1995–97	265	100	50	13	24	2	1	1	10	45	100	62	10	5	7	6	2	7
Biology																		
1988–91	45	100	76	7	13	0	0	3	1	10	100	74	8	13	5	0	0	0
1995–97	48	100	74	4	17	1	1	1	1	6	100	NA	NA	NA	NA	NA	NA	NA
Engineering and technology																		
1988–91	159	100	56	20	6	13	3	1	2	51	100	48	20	11	8	10	0	3
1995–97	247	100	55	22	6	11	3	0	3	64	100	47	20	8	9	10	1	5
Psychology																		
1988–91	2	100	NA	NA	NA	NA	NA	NA	NA	4	100	NA	NA	NA	NA	NA	NA	NA
1995–97	0	100	NA	NA	NA	NA	NA	NA	NA	4	100	NA	NA	NA	NA	NA	NA	NA
Social sciences																		
1988–91	2	100	NA	NA	NA	NA	NA	NA	NA	15	100	64	3	14	2	0	2	15
1995–97	4	100	NA	NA	NA	NA	NA	NA	NA	21	100	70	5	5	3	0	0	17
Health and professional fields																		
1988–91	0	100	NA	NA	NA	NA	NA	NA	NA	20	100	69	16	3	0	0	1	11
1995–97	0	100	NA	NA	NA	NA	NA	NA	NA	34	100	66	3	20	0	0	3	8

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-52.

Patterns of cross-sectoral coauthorship of U.S. scientific and technical articles, by sector and field: 1988–91 and 1995–97

Years	Articles (number)	Percent of state and local government cross-sectoral coauthorships with: Total	Academia	Industry	Federal Govt.	University FFRDC	Industry FFRDC	Nonprofit FFRDC	Nonprofit	Articles (number)	Percent of nonprofit institution cross-sectoral coauthorships with: Total	Academia	Industry	Federal Govt.	University FFRDC	Industry FFRDC	Nonprofit FFRDC	Other govt.
Total science and engineering																		
1988–91	3,214	100	68	6	12	0	0	0	14	13,610	100	79	7	9	1	0	0	3
1995–97	3,174	100	63	8	14	0	0	0	14	15,919	100	75	10	10	1	0	0	3
Physics																		
1988–91	7	100	NA	NA	NA	NA	NA	NA	NA	250	100	70	12	9	8	1	1	0
1995–97	16	100	75	10	4	4	0	4	2	251	100	72	8	9	9	2	0	0
Chemistry																		
1988–91	33	100	62	15	16	0	0	1	6	140	100	68	15	12	2	1	1	1
1995–97	35	100	75	9	7	4	0	0	6	171	100	75	10	10	2	2	1	1
Earth and space sciences																		
1988–91	135	100	60	18	14	1	0	0	6	599	100	63	7	16	11	0	1	1
1995–97	172	100	63	19	11	2	0	0	4	875	100	61	7	19	11	0	1	1
Mathematics																		
1988–91	3	100	NA	NA	NA	NA	NA	NA	NA	44	100	86	9	4	1	0	0	1
1995–97	2	100	NA	NA	NA	NA	NA	NA	NA	42	100	85	6	9	0	0	0	0
Clinical medicine																		
1988–91	2,011	100	67	4	12	0	0	0	16	8,569	100	80	7	9	0	0	0	4
1995–97	1,917	100	61	7	14	0	0	0	18	9,821	100	76	10	10	0	0	0	3
Biomedical research																		
1988–91	383	100	70	6	9	1	0	0	13	2,478	100	80	7	9	1	1	0	2
1995–97	384	100	65	8	13	1	0	0	13	3,106	100	78	9	8	1	1	0	2
Biology																		
1988–91	233	100	70	5	19	0	1	0	5	325	100	77	4	14	0	0	0	4
1995–97	267	100	66	8	22	0	0	0	4	372	100	75	6	15	0	0	0	3
Engineering and technology																		
1988–91	31	100	64	24	6	1	3	0	2	171	100	51	32	9	5	1	1	0
1995–97	45	100	51	37	5	2	0	1	4	169	100	49	28	13	3	4	2	1
Psychology																		
1988–91	142	100	79	4	7	0	0	0	11	311	100	87	4	4	0	0	0	5
1995–97	105	100	76	3	8	0	0	0	13	291	100	86	3	6	0	0	0	5
Social sciences																		
1988–91	49	100	81	5	10	0	0	1	4	296	100	87	4	7	0	0	1	1
1995–97	46	100	78	7	10	0	0	0	4	355	100	85	3	10	0	0	1	1
Health and professional fields																		
1988–91	187	100	71	4	12	0	0	0	12	430	100	77	10	7	0	0	1	5
1995–97	185	100	64	8	14	0	0	1	13	465	100	77	9	9	0	0	1	5

NA = not appropriate, average of fewer than 10 cross-sector articles annually; FFRDC = Federally Funded Research and Development Center

NOTES: Counts are rounded prorated article counts; for example, an article with two authors in two sectors is counted as half an article in each. Percentages are based on these fractional counts.

SOURCES: Institute for Scientific Information, Science and Social Science Citation Indexes; CHI Research, Inc., Science Indicators database; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See page 6-44 in Volume 1.

Appendix table 6-53.
Distribution of citations in U.S. scientific and technical articles to other U.S. articles, by sector and field: 1990–93 and 1994–97

Citing sector	Citing year	Total U.S. citations	Percentages of citations to: U.S. total	Academia	Industry	Federal Govt.	FFRDCs	Nonprofit sector	Other govt.	Unknown sector
Total science and engineering										
U.S. Total	1990–93	690,032	100	70.9	7.6	9.2	2.5	8.5	0.9	0.4
	1994–97	709,043	100	71.9	7.2	8.3	2.4	8.9	0.7	0.5
Academic	1990–93	509,285	100	77.1	5.5	7.1	1.8	7.3	0.7	0.4
	1994–97	526,821	100	77.6	5.5	6.4	1.8	7.6	0.6	0.4
Industry	1990–93	44,362	100	47.3	35.0	7.7	3.0	5.9	0.5	0.5
	1994–97	42,980	100	50.3	31.5	7.3	2.4	7.4	0.5	0.6
Federal Govt.	1990–93	56,927	100	52.5	6.4	30.4	2.1	7.3	1.0	0.4
	1994–97	54,933	100	54.2	6.3	28.6	2.1	7.4	1.0	0.5
FFRDCs	1990–93	15,722	100	48.2	10.5	7.0	30.6	3.4	0.2	0.2
	1994–97	17,117	100	51.8	8.8	7.0	28.5	3.4	0.2	0.3
Nonprofit	1990–93	54,443	100	59.7	5.0	8.2	1.0	24.3	1.1	0.7
	1994–97	58,717	100	60.2	5.4	7.1	0.9	24.8	0.9	0.7
Other govt.	1990–93	5,785	100	59.6	4.0	12.1	0.7	9.8	12.9	0.9
	1994–97	5,086	100	60.5	4.8	11.2	0.7	10.0	11.6	1.2
Unknown	1990–93	3,511	100	63.9	7.3	9.2	1.5	11.9	1.9	4.3
	1994–97	3,389	100	63.6	6.9	9.2	1.2	13.0	1.7	4.4
Physics										
U.S. Total	1990–93	60,148	100	60.6	20.8	5.1	11.9	1.5	0.0	0.1
	1994–97	56,908	100	66.7	14.6	5.5	11.6	1.5	0.0	0.2
Academic	1990–93	40,458	100	70.6	15.0	3.6	9.2	1.4	0.0	0.1
	1994–97	41,381	100	74.7	11.3	4.0	8.6	1.4	0.0	0.1
Industry	1990–93	9,050	100	34.6	53.6	3.7	7.1	0.8	0.0	0.1
	1994–97	5,242	100	40.0	46.2	5.0	7.6	0.9	0.0	0.3
Federal Govt.	1990–93	3,202	100	42.6	16.8	30.1	8.9	1.3	0.0	0.3
	1994–97	3,098	100	46.6	13.6	30.7	7.5	1.3	0.0	0.3
FFRDCs	1990–93	6,501	100	44.2	14.2	3.2	37.1	1.3	0.0	0.1
	1994–97	6,440	100	47.8	11.1	3.3	36.7	0.9	0.0	0.2
Nonprofit	1990–93	806	100	53.9	11.9	6.3	8.8	18.8	0.0	0.4
	1994–97	642	100	56.3	8.5	5.3	9.2	20.6	0.0	0.3
Other govt.	1990–93	8	100	61.3	9.7	12.9	6.5	0.0	9.7	0.0
	1994–97	12	100	70.8	6.3	10.4	10.4	0.0	2.1	0.0
Unknown	1990–93	124	100	49.7	23.7	8.9	12.9	2.2	0.0	2.6
	1994–97	94	100	56.7	20.6	6.4	11.2	1.6	0.0	3.7
Chemistry										
U.S. Total	1990–93	42,364	100	77.6	12.6	4.1	4.3	1.2	0.1	0.1
	1994–97	44,494	100	77.6	11.8	4.1	4.1	2.1	0.1	0.2
Academic	1990–93	33,565	100	85.0	8.3	2.4	3.2	0.9	0.1	0.1
	1994–97	35,503	100	84.7	8.3	2.4	3.0	1.4	0.1	0.1
Industry	1990–93	4,834	100	48.0	43.5	4.0	2.8	1.3	0.1	0.3
	1994–97	4,380	100	48.7	41.8	4.3	2.6	2.1	0.1	0.3
Federal Govt.	1990–93	1,622	100	44.5	12.4	37.2	3.3	2.0	0.2	0.3
	1994–97	1,642	100	43.4	11.2	39.4	3.1	1.9	0.6	0.4
FFRDCs	1990–93	1,549	100	51.2	10.4	3.9	33.6	0.8	0.0	0.1
	1994–97	1,874	100	56.8	8.6	3.2	30.3	0.9	0.0	0.1
Nonprofit	1990–93	647	100	61.4	10.9	5.4	2.1	19.8	0.2	0.2
	1994–97	967	100	52.2	11.6	3.7	2.2	29.8	0.3	0.3
Other govt.	1990–93	79	100	55.2	11.1	14.6	2.2	2.9	13.7	0.3
	1994–97	69	100	54.4	15.3	14.2	3.3	4.0	8.4	0.4
Unknown	1990–93	70	100	56.1	22.7	10.1	5.0	2.5	0.0	3.6
	1994–97	59	100	62.3	19.5	8.9	1.7	5.9	0.4	1.3

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-53.
Distribution of citations in U.S. scientific and technical articles to other U.S. articles, by sector and field: 1990–93 and 1994–97

Citing sector	Citing year	Total U.S. citations	Percentages of citations to: U.S. total	Academia	Industry	Federal Govt.	FFRDCs	Nonprofit sector	Other govt.	Unknown sector
Earth and space sciences										
U.S. Total	1990–93	32,236	100	65.5	5.0	14.5	8.3	5.8	0.6	0.3
	1994–97	35,858	100	66.0	4.7	14.4	8.0	6.1	0.6	0.4
Academic	1990–93	21,880	100	71.8	4.0	11.4	6.6	5.4	0.5	0.3
	1994–97	24,560	100	72.6	3.5	10.9	6.3	5.8	0.5	0.4
Industry	1990–93	1,531	100	48.5	21.5	17.2	7.2	3.5	1.6	0.5
	1994–97	1,474	100	46.2	22.3	18.9	7.9	2.8	1.1	0.7
Federal Govt.	1990–93	4,288	100	49.3	5.3	33.0	8.0	3.5	0.6	0.3
	1994–97	4,683	100	48.6	5.8	33.5	7.5	3.4	0.7	0.5
FFRDCs	1990–93	2,440	100	51.7	4.4	12.6	26.0	4.8	0.2	0.3
	1994–97	2,939	100	52.1	4.1	13.5	25.0	4.6	0.3	0.4
Nonprofit	1990–93	1,756	100	62.2	2.7	7.7	6.3	20.4	0.2	0.4
	1994–97	1,900	100	61.6	2.6	8.9	5.3	20.8	0.3	0.5
Other govt.	1990–93	198	100	51.2	7.6	15.8	3.0	3.4	18.6	0.5
	1994–97	176	100	54.3	10.7	14.8	2.1	2.4	14.4	1.1
Unknown	1990–93	144	100	54.0	8.5	18.1	5.7	7.3	0.9	5.4
	1994–97	127	100	53.5	9.6	17.9	7.5	5.1	2.0	4.3
Mathematics										
U.S. Total	1990–93	3,740	100	87.6	5.1	2.6	2.7	1.8	0.1	0.2
	1994–97	3,375	100	89.7	3.5	2.6	1.6	2.3	0.1	0.1
Academic	1990–93	3,287	100	90.4	4.1	1.7	2.0	1.6	0.1	0.1
	1994–97	3,030	100	92.0	2.8	1.8	1.2	2.0	0.1	0.1
Industry	1990–93	153	100	65.7	26.2	2.8	4.3	1.0	0.0	0.0
	1994–97	113	100	70.7	19.8	4.4	3.1	1.6	0.2	0.2
Federal Govt.	1990–93	136	100	65.0	6.3	21.9	3.3	2.9	0.2	0.4
	1994–97	90	100	66.4	5.3	24.4	1.1	2.5	0.3	0.0
FFRDCs	1990–93	81	100	63.0	4.9	1.2	29.9	0.6	0.0	0.3
	1994–97	65	100	64.8	7.3	7.7	18.8	1.1	0.4	0.0
Nonprofit	1990–93	65	100	78.8	4.6	3.5	0.0	12.7	0.4	0.0
	1994–97	62	100	73.9	3.2	4.0	0.8	16.5	0.8	0.8
Other govt.	1990–93	7	100	74.1	3.7	3.7	0.0	18.5	0.0	0.0
	1994–97	5	100	84.2	0.0	0.0	0.0	0.0	15.8	0.0
Unknown	1990–93	12	100	71.7	8.7	4.3	0.0	4.3	0.0	10.9
	1994–97	9	100	88.6	5.7	2.9	0.0	2.9	0.0	0.0
Biology										
U.S. Total	1990–93	30,321	100	78.1	2.9	13.5	1.0	3.2	1.0	0.3
	1994–97	28,571	100	76.7	3.1	14.0	1.1	3.6	1.0	0.5
Academic	1990–93	23,685	100	84.6	2.4	8.6	0.8	2.6	0.8	0.3
	1994–97	22,131	100	83.3	2.5	9.2	0.9	2.9	0.8	0.4
Industry	1990–93	892	100	61.7	20.9	11.5	0.9	3.5	1.0	0.5
	1994–97	867	100	58.7	21.1	14.2	0.9	3.8	0.8	0.5
Federal Govt.	1990–93	4,041	100	49.4	2.4	44.0	0.7	1.9	1.2	0.3
	1994–97	3,901	100	49.6	2.7	42.7	0.9	2.5	1.2	0.5
FFRDCs	1990–93	281	100	63.0	1.8	10.2	21.2	2.9	0.4	0.4
	1994–97	286	100	62.7	2.0	11.7	19.0	3.8	0.7	0.3
Nonprofit	1990–93	956	100	64.2	2.5	7.8	0.6	23.4	1.1	0.5
	1994–97	981	100	63.1	2.2	9.1	1.2	22.3	1.1	0.9
Other govt.	1990–93	313	100	62.2	1.6	14.8	0.7	3.6	16.5	0.6
	1994–97	277	100	57.7	2.8	19.4	1.4	3.8	13.5	1.4
Unknown	1990–93	153	100	71.6	4.4	14.6	0.5	3.1	1.8	3.8
	1994–97	128	100	61.9	4.3	15.0	1.4	4.9	1.8	10.5

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-53.
Distribution of citations in U.S. scientific and technical articles to other U.S. articles, by sector and field: 1990–93 and 1994–97

Citing sector	Citing year	Total U.S. citations	Percentages of citations to: U.S. total	Academia	Industry	Federal Govt.	FFRDCs	Nonprofit sector	Other govt.	Unknown sector
Biomedical research										
U.S. Total	1990–93	220,576	100	71.8	7.1	9.4	1.3	9.7	0.5	0.2
	1994–97	239,216	100	73.3	6.9	7.6	1.4	10.1	0.4	0.2
Academic	1990–93	165,090	100	77.0	5.6	7.3	1.0	8.5	0.4	0.2
	1994–97	179,669	100	78.1	5.4	6.0	1.2	8.8	0.3	0.2
Industry	1990–93	12,813	100	52.9	26.7	9.1	1.7	8.9	0.5	0.3
	1994–97	14,383	100	54.8	26.2	6.9	1.6	9.8	0.4	0.4
Federal Govt.	1990–93	19,018	100	54.3	7.0	28.6	1.3	8.1	0.5	0.2
	1994–97	18,518	100	57.9	6.4	25.1	1.6	8.4	0.4	0.3
FFRDCs	1990–93	2,602	100	56.1	9.1	9.6	17.6	7.2	0.2	0.1
	1994–97	3,074	100	59.5	7.9	8.3	16.8	7.1	0.2	0.3
Nonprofit	1990–93	19,106	100	60.6	6.9	7.9	1.0	22.9	0.5	0.3
	1994–97	21,756	100	62.4	6.6	6.1	1.1	23.2	0.3	0.3
Other govt.	1990–93	1,355	100	59.1	6.4	10.3	1.0	8.7	14.1	0.4
	1994–97	1,236	100	59.7	7.1	9.2	1.0	9.7	12.7	0.4
Unknown	1990–93	591	100	66.1	8.8	9.5	1.5	11.0	1.1	1.8
	1994–97	580	100	65.7	8.3	9.9	1.3	11.3	0.9	2.6
Clinical medicine										
U.S. Total	1990–93	234,096	100	67.9	5.0	11.2	0.5	13.0	1.6	0.7
	1994–97	236,121	100	67.8	6.2	10.0	0.5	13.3	1.4	0.8
Academic	1990–93	165,198	100	73.1	3.7	9.4	0.4	11.3	1.5	0.6
	1994–97	166,041	100	72.9	4.8	8.5	0.4	11.5	1.2	0.8
Industry	1990–93	11,746	100	50.0	27.1	10.0	0.7	10.1	1.0	1.0
	1994–97	13,632	100	50.0	28.7	8.2	0.5	10.8	0.9	0.9
Federal Govt.	1990–93	21,909	100	53.5	4.7	28.9	0.6	10.0	1.7	0.6
	1994–97	20,289	100	54.7	5.4	26.9	0.6	10.1	1.6	0.7
FFRDCs	1990–93	1,068	100	48.8	7.2	15.6	17.2	9.8	0.9	0.5
	1994–97	1,243	100	52.2	8.1	12.3	16.2	10.0	0.8	0.4
Nonprofit	1990–93	28,964	100	58.4	3.8	8.8	0.4	26.1	1.6	0.9
	1994–97	30,251	100	58.2	4.7	7.9	0.3	26.5	1.2	1.0
Other govt.	1990–93	3,307	100	58.8	3.2	12.8	0.4	12.0	11.9	1.0
	1994–97	2,826	100	60.1	3.8	11.8	0.3	12.1	10.8	1.3
Unknown	1990–93	1,904	100	62.5	5.6	9.4	0.4	15.5	2.2	4.4
	1994–97	1,839	100	61.2	5.8	9.3	0.3	17.2	2.0	4.3
Engineering and technology										
U.S. Total	1990–93	15,210	100	62.9	20.2	7.2	8.0	1.4	0.1	0.3
	1994–97	14,732	100	65.3	17.8	8.0	7.1	1.4	0.1	0.4
Academic	1990–93	10,247	100	75.1	14.0	4.6	5.0	1.0	0.1	0.2
	1994–97	10,311	100	76.1	12.7	5.3	4.5	1.1	0.1	0.3
Industry	1990–93	2,569	100	38.2	50.0	5.3	5.0	1.1	0.1	0.3
	1994–97	2,060	100	40.5	46.2	6.3	4.8	1.4	0.1	0.7
Federal Govt.	1990–93	1,034	100	38.6	14.8	38.7	6.1	1.3	0.1	0.3
	1994–97	1,102	100	39.9	15.0	37.8	5.6	1.3	0.1	0.3
FFRDCs	1990–93	1,077	100	33.7	12.1	6.4	46.5	1.1	0.0	0.2
	1994–97	1,046	100	37.4	14.8	6.9	39.1	1.2	0.0	0.5
Nonprofit	1990–93	211	100	43.8	18.5	5.3	5.6	26.3	0.1	0.4
	1994–97	148	100	46.1	17.1	6.9	5.1	23.3	0.3	1.2
Other govt.	1990–93	15	100	62.7	11.9	5.1	3.4	0.0	16.9	0.0
	1994–97	14	100	66.1	8.9	16.1	0.0	0.0	7.1	1.8
Unknown	1990–93	59	100	50.0	30.5	6.4	7.6	2.5	0.4	2.5
	1994–97	51	100	48.5	27.7	10.4	6.9	3.5	0.0	3.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-53.
Distribution of citations in U.S. scientific and technical articles to other U.S. articles, by sector and field: 1990–93 and 1994–97

Citing sector	Citing year	Total U.S. citations	Percentages of citations to: U.S. total	Academia	Industry	Federal Govt.	FFRDCs	Nonprofit sector	Other govt.	Unknown sector
Psychology										
U.S. Total	1990–93	19,404	100	89.8	1.1	3.0	0.1	3.9	1.0	1.0
	1994–97	18,597	100	90.2	0.8	2.9	0.1	3.8	1.2	1.0
Academic	1990–93	17,370	100	91.7	1.0	2.3	0.1	3.2	0.9	0.9
	1994–97	16,686	100	91.9	0.7	2.4	0.1	3.1	1.1	0.9
Industry	1990–93	205	100	75.2	11.3	3.5	0.1	5.7	1.7	2.7
	1994–97	187	100	77.0	7.9	5.5	0.3	6.3	0.9	2.1
Federal Govt.	1990–93	644	100	72.3	1.4	20.2	0.0	4.0	1.3	0.7
	1994–97	546	100	73.8	1.3	18.1	0.2	4.2	1.7	0.8
FFRDCs	1990–93	26	100	77.9	3.8	2.9	5.8	7.7	1.9	0.0
	1994–97	18	100	77.8	1.4	2.8	9.7	2.8	2.8	4.2
Nonprofit	1990–93	720	100	73.6	1.3	3.1	0.1	18.2	1.5	2.3
	1994–97	718	100	74.1	0.9	3.0	0.0	18.7	1.4	1.7
Other govt.	1990–93	225	100	79.0	1.1	3.7	0.3	4.8	9.5	1.7
	1994–97	210	100	77.0	1.2	3.5	0.0	5.1	11.3	1.9
Unknown	1990–93	214	100	76.5	2.6	2.7	0.0	7.1	2.2	8.8
	1994–97	232	100	78.2	1.1	4.2	0.2	6.8	2.0	7.4
Social sciences										
U.S. Total	1990–93	12,104	100	88.4	1.3	4.1	0.6	4.6	0.5	0.5
	1994–97	11,943	100	86.9	1.4	4.3	0.6	5.7	0.5	0.5
Academic	1990–93	10,869	100	90.5	1.2	3.3	0.4	3.8	0.4	0.5
	1994–97	10,555	100	89.5	1.1	3.3	0.5	4.8	0.4	0.4
Industry	1990–93	131	100	69.8	11.5	6.9	3.2	6.9	0.6	1.1
	1994–97	161	100	64.3	16.7	7.6	1.4	6.8	2.0	1.1
Federal Govt.	1990–93	460	100	70.8	1.5	19.7	0.4	6.6	0.5	0.5
	1994–97	471	100	65.3	1.9	23.0	0.9	7.4	0.9	0.6
FFRDCs	1990–93	59	100	56.0	3.4	6.0	26.1	7.3	1.3	0.0
	1994–97	73	100	60.5	5.5	4.8	18.9	7.6	1.4	1.4
Nonprofit	1990–93	475	100	70.5	1.3	5.1	0.9	20.8	0.4	0.9
	1994–97	554	100	69.6	1.5	5.7	0.6	21.5	0.5	0.5
Other govt.	1990–93	57	100	73.6	3.1	5.3	3.1	1.8	12.3	0.9
	1994–97	58	100	73.4	3.9	3.9	0.4	3.4	12.4	2.6
Unknown	1990–93	56	100	79.6	3.1	4.9	0.0	4.9	2.7	4.9
	1994–97	69	100	75.1	4.3	5.4	1.4	8.3	1.8	3.6
Health and professional										
U.S. Total	1990–93	19,836	100	85.7	3.3	4.1	0.4	4.0	1.3	1.2
	1994–97	19,230	100	85.5	3.0	3.9	0.3	4.8	1.3	1.1
Academic	1990–93	17,637	100	88.5	2.8	3.1	0.3	3.3	1.0	1.0
	1994–97	16,953	100	88.4	2.5	3.0	0.3	3.9	1.0	1.0
Industry	1990–93	440	100	63.0	23.5	5.5	1.0	4.4	1.2	1.2
	1994–97	482	100	65.5	20.2	4.7	0.7	5.6	1.5	1.8
Federal Govt.	1990–93	575	100	58.1	4.0	24.3	1.0	7.1	4.2	1.4
	1994–97	593	100	60.1	3.4	21.8	0.7	8.0	4.5	1.5
FFRDCs	1990–93	37	100	68.0	3.4	6.1	12.9	8.8	0.7	0.0
	1994–97	58	100	67.4	4.7	5.6	8.6	11.2	1.3	1.3
Nonprofit	1990–93	735	100	67.1	3.2	7.6	1.5	15.6	2.7	2.4
	1994–97	740	100	64.3	2.9	7.5	1.1	19.1	2.9	2.3
Other govt.	1990–93	222	100	55.4	3.3	15.9	1.1	8.1	13.9	2.4
	1994–97	202	100	61.3	2.8	9.9	0.4	8.8	14.2	2.6
Unknown	1990–93	188	100	69.1	3.9	5.2	1.2	9.6	4.1	6.9
	1994–97	202	100	71.3	4.3	5.4	0.4	9.7	2.8	6.1

FFRDC = Federally Funded Research and Development Center

NOTE: Details may not add to total because of rounding.

SOURCES: Institute for Scientific Information, Science Citation and Social Science Citation Indexes; CHI Research, Inc., Science Indicators database; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See page 6-44 in Volume 1.

Appendix table 6-54.
Distribution of citations in U.S. scientific and technical articles across broad and fine fields: 1997

Broad/fine field of citing article	Number of citations	Percentage of cited articles in: Same fine field	Total	Physics	Chemistry	Earth & space sciences	Mathe-matics	Biology	Biomedical research	Clinical medicine	Engineering & technology	Psychology	Social sciences	Health & professional
Broad field														
Total	1,276,085	NA	100.0	9.4	7.1	5.0	0.4	3.8	33.3	33.9	1.9	2.0	1.2	1.9
Physics	120,589	NA	100.0	81.7	6.9	2.1	0.4	0.1	4.3	0.6	3.8	0.0	0.0	0.0
Chemistry	103,526	NA	100.0	11.1	69.0	1.6	0.0	1.2	12.0	3.3	1.7	0.0	0.0	0.0
Earth & space sciences	64,935	NA	100.0	2.3	1.3	83.2	0.1	2.8	8.0	1.0	1.0	0.0	0.2	0.1
Mathematics	5,034	NA	100.0	8.2	0.8	0.7	77.4	0.6	1.9	1.5	7.5	0.2	0.7	0.4
Biology	53,515	NA	100.0	0.2	1.6	3.8	0.1	61.7	25.0	5.7	0.3	1.1	0.3	0.1
Biomedical research	342,463	NA	100.0	0.5	1.7	0.7	0.0	2.5	75.4	18.6	0.1	0.3	0.1	0.1
Clinical medicine	493,181	NA	100.0	0.1	0.3	0.1	0.0	0.6	25.8	71.4	0.0	0.9	0.1	0.6
Engineering & technology	26,315	NA	100.0	21.3	7.1	2.6	1.7	0.5	2.6	1.3	61.9	0.1	0.3	0.6
Psychology	25,442	NA	100.0	0.3	0.0	0.0	0.1	1.7	4.4	18.2	0.2	65.5	2.6	6.9
Social sciences	15,458	NA	100.0	0.2	0.0	1.0	0.8	1.3	2.2	3.4	0.3	4.5	77.3	9.0
Misc. other fields	25,627	NA	100.0	0.3	0.1	0.1	0.3	0.1	1.2	13.9	1.2	8.4	7.4	67.1
Physics														
Acoustics	1,926	56.7	100.0	64.8	0.4	1.9	1.9	0.4	2.4	9.6	13.6	2.2	0.2	2.6
Applied physics	21,571	52.3	100.0	81.0	5.3	0.4	0.1	0.0	3.9	0.4	8.9	0.0	0.0	0.0
Chemical physics	18,227	44.3	100.0	64.6	26.4	0.9	0.0	0.1	6.1	0.7	1.2	0.0	0.0	0.0
Fluids & plasmas	4,461	52.2	100.0	80.4	1.6	7.1	0.8	0.0	1.7	0.2	8.1	0.0	0.0	0.0
General physics	32,160	48.9	100.0	84.5	3.6	2.7	1.0	0.1	6.1	0.3	1.7	0.0	0.1	0.0
Nuclear & particle physics	17,004	68.8	100.0	93.5	0.4	4.2	0.1	0.0	1.2	0.1	0.4	0.0	0.0	0.0
Optics	8,094	52.1	100.0	79.1	2.4	2.7	0.2	0.4	3.5	2.8	8.7	0.1	0.1	0.0
Solid state physics	16,619	40.1	100.0	88.3	5.0	0.3	0.0	0.0	3.8	0.0	2.5	0.0	0.0	0.0
Misc. physics	531	28.4	100.0	64.6	1.3	5.6	15.6	0.0	2.4	0.4	10.0	0.0	0.0	0.0
Chemistry														
Analytical chemistry	13,350	56.3	100.0	3.6	67.0	4.1	0.1	2.9	12.7	8.1	1.4	0.0	0.0	0.0
Applied chemistry	930	21.6	100.0	0.8	51.0	3.1	0.0	8.6	18.5	12.7	4.2	0.1	0.0	1.1
General chemistry	27,688	36.7	100.0	8.6	65.2	1.4	0.0	1.3	19.1	3.5	0.8	0.0	0.0	0.0
Inorganic & nuclear chemistry	8,616	34.8	100.0	3.1	86.7	0.7	0.0	0.1	7.6	1.1	0.8	0.0	0.0	0.0
Organic chemistry	18,199	39.4	100.0	1.1	82.2	0.1	0.0	1.9	9.3	5.1	0.2	0.0	0.0	0.0
Physical chemistry	26,508	2.1	100.0	27.4	56.0	2.2	0.0	0.3	9.5	0.8	3.7	0.0	0.0	0.0
Polymers	8,239	5.6	100.0	10.7	81.3	0.1	0.1	0.2	4.6	0.4	2.8	0.0	0.0	0.0
Earth & space sciences														
Astronomy & astrophysics	24,256	89.8	100.0	2.7	0.1	93.1	0.0	0.0	3.8	0.0	0.1	0.0	0.0	0.0
Earth & planetary science	15,821	64.4	100.0	2.3	0.8	82.5	0.1	1.1	11.4	0.1	1.4	0.0	0.2	0.0
Environmental science	8,598	54.2	100.0	1.0	5.0	63.4	0.1	10.3	9.5	7.1	2.4	0.1	0.8	0.3
Geology	5,237	47.6	100.0	1.7	2.0	81.8	0.0	2.7	10.6	0.0	0.8	0.0	0.3	0.0
Meteorology & atmospheric science	7,276	63.7	100.0	3.3	2.0	84.0	0.1	1.0	7.6	0.1	1.4	0.0	0.5	0.0
Oceanography & limnology	3,747	51.7	100.0	2.1	0.7	66.9	0.1	15.2	13.8	0.3	0.8	0.0	0.0	0.0
Mathematics														
Applied mathematics	1,779	53.4	100.0	13.4	1.8	1.8	62.1	0.4	2.4	0.5	16.8	0.1	0.2	0.6
General mathematics	2,166	78.7	100.0	6.6	0.3	0.0	89.8	0.2	0.7	0.0	2.2	0.1	0.1	0.0
Probability & statistics	968	72.8	100.0	2.6	0.3	0.3	75.7	1.8	3.9	7.0	3.2	1.0	2.9	1.2
Misc. mathematics	125	40.0	100.0	5.6	0.0	0.0	90.4	0.8	0.0	0.0	3.2	0.0	0.0	0.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-54.
Distribution of citations in U.S. scientific and technical articles across broad and fine fields: 1997

Broad/fine field of citing article	Number of citations	Percentage of cited articles in: Same fine field	Total	Physics	Chemistry	Earth & space sciences	Mathe-matics	Biology	Biomedical research	Clinical medicine	Engineering & technology	Psychology	Social sciences	Health & professional
Biology														
Agriculture & food science	9,473	50.1	100.0	0.2	5.1	5.8	0.0	66.7	16.5	4.5	0.7	0.2	0.4	0.0
Botany	17,202	51.1	100.0	0.1	1.6	0.9	0.1	62.3	33.2	1.5	0.2	0.0	0.1	0.0
Dairy & animal science	4,051	56.4	100.0	0.0	0.9	0.1	0.1	62.3	15.2	20.6	0.0	0.6	0.1	0.1
Ecology	5,826	46.7	100.0	0.6	0.2	4.4	0.4	75.7	14.2	0.8	0.6	2.3	0.7	0.2
Entomology	3,676	53.5	100.0	0.0	0.8	0.5	0.0	69.2	22.9	4.7	0.1	1.8	0.1	0.1
General biology	3,006	10.5	100.0	0.2	0.5	0.7	0.0	21.4	55.8	20.1	0.1	0.8	0.4	0.1
General zoology	2,397	13.4	100.0	0.1	0.5	1.1	0.1	47.0	33.8	11.8	0.0	5.0	0.6	0.0
Marine & hydrobiology	5,087	47.6	100.0	0.5	0.5	18.3	0.2	63.9	12.1	3.6	0.2	0.5	0.2	0.0
Misc. biology	858	19.6	100.0	0.7	0.3	9.3	0.7	34.0	28.8	18.5	0.3	2.4	4.4	0.3
Misc. zoology	1,941	30.6	100.0	0.2	0.1	0.7	0.1	62.1	25.2	3.3	0.0	7.9	0.3	0.1
Biomedical research														
Anatomy & morphology	1,231	6.1	100.0	0.0	0.0	0.0	0.0	5.6	46.6	47.0	0.2	0.5	0.2	0.0
Biochemistry & molecular biology	155,574	49.9	100.0	0.3	2.6	0.1	0.0	1.8	81.1	14.0	0.0	0.1	0.0	0.0
Biomedical engineering	4,422	23.0	100.0	0.7	6.9	3.7	0.3	2.6	59.3	23.7	2.5	0.1	0.0	0.1
Biophysics	5,300	16.7	100.0	4.6	7.6	0.0	0.3	1.4	75.5	9.9	0.5	0.1	0.0	0.0
Cell biology, cytology & histology	25,074	21.0	100.0	0.3	0.5	0.0	0.0	1.2	76.5	21.4	0.0	0.0	0.0	0.0
Embryology	8,534	27.1	100.0	0.0	0.0	0.0	0.0	0.9	88.6	10.3	0.0	0.1	0.0	0.0
Genetics & heredity	22,244	29.8	100.0	0.0	0.2	0.2	0.1	6.3	78.2	14.2	0.0	0.6	0.2	0.1
General biomedical research	40,372	25.8	100.0	1.9	1.8	3.6	0.1	3.5	62.9	24.5	0.2	1.2	0.2	0.1
Microbiology	20,814	43.5	100.0	0.0	0.7	1.9	0.0	4.0	78.2	15.1	0.1	0.0	0.0	0.0
Microscopy	1,074	9.5	100.0	7.9	2.2	0.9	0.1	2.4	52.3	31.0	2.8	0.0	0.2	0.1
Nutrition & dietetics	6,218	26.4	100.0	0.0	0.4	0.0	0.1	5.0	49.4	41.7	0.0	1.7	0.1	1.5
Parasitology	2,913	26.7	100.0	0.0	0.4	0.3	0.0	9.1	68.0	22.0	0.0	0.1	0.0	0.0
Physiology	27,141	29.7	100.0	0.1	0.1	0.0	0.0	1.9	60.7	36.6	0.0	0.5	0.1	0.0
Virology	18,751	48.3	100.0	0.0	0.1	0.0	0.0	1.0	83.9	15.0	0.0	0.0	0.0	0.0
Misc. biomedical research	2,802	16.0	100.0	0.2	1.2	0.8	0.1	2.2	46.4	45.6	0.6	1.0	1.1	0.6
Clinical medicine														
Addictive diseases	3,795	34.4	100.0	0.0	0.1	0.0	0.2	0.2	8.9	72.1	0.0	11.4	1.8	5.3
Allergy	1,599	26.1	100.0	0.1	0.2	0.0	0.1	0.3	15.1	83.1	0.0	0.6	0.0	0.5
Anesthesiology	4,888	49.7	100.0	0.0	0.1	0.0	0.0	0.3	7.2	91.7	0.1	0.1	0.0	0.5
Arthritis & rheumatism	4,696	31.8	100.0	0.0	0.0	0.0	0.0	0.2	14.4	84.2	0.0	0.3	0.0	0.8
Cancer	38,643	39.7	100.0	0.0	0.2	0.0	0.0	0.4	29.5	69.5	0.0	0.1	0.0	0.2
Cardiovascular system	32,414	48.2	100.0	0.0	0.0	0.0	0.0	0.5	22.9	76.2	0.0	0.1	0.0	0.2
Dentistry	3,744	57.8	100.0	0.1	0.1	0.0	0.1	0.6	14.0	83.5	0.3	0.6	0.1	0.6
Dermatology & venereal disease	6,245	35.8	100.0	0.0	0.1	0.0	0.0	0.3	21.8	76.4	0.0	0.2	0.1	1.2
Endocrinology	23,643	29.5	100.0	0.0	0.1	0.0	0.0	1.1	38.8	59.3	0.0	0.5	0.0	0.1
Environmental & occupational health	5,256	25.0	100.0	0.0	0.8	3.4	0.3	2.3	13.9	69.9	0.1	2.2	1.4	5.7
Fertility	4,097	28.2	100.0	0.0	0.0	0.1	0.0	5.0	28.2	66.0	0.0	0.4	0.0	0.3
Gastroenterology	12,295	29.2	100.0	0.0	0.1	0.0	0.0	0.3	24.0	75.3	0.0	0.1	0.0	0.2
General & internal medicine	38,547	23.1	100.0	0.0	0.2	0.0	0.1	0.5	22.3	74.7	0.0	0.5	0.1	1.6
Geriatrics	3,301	18.1	100.0	0.0	0.0	0.0	0.1	0.8	25.5	68.9	0.0	0.9	0.3	3.5
Hematology	18,216	29.3	100.0	0.0	0.0	0.0	0.0	0.6	36.9	62.4	0.0	0.0	0.0	0.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-54.
Distribution of citations in U.S. scientific and technical articles across broad and fine fields: 1997

Broad/fine field of citing article	Number of citations	Percentage of cited articles in: Same fine field	Total	Physics	Chemistry	Earth & space sciences	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering & technology	Psychology	Social sciences	Health & professional
Clinical medicine -- Continued														
Immunology	63,293	43.6	100.0	0.0	0.1	0.0	0.0	0.4	36.9	62.5	0.0	0.0	0.0	0.1
Nephrology	6,347	26.3	100.0	0.0	0.0	0.0	0.0	0.5	30.8	68.4	0.0	0.0	0.0	0.2
Neurology & neurosurgery	69,155	48.9	100.0	0.3	0.1	0.0	0.0	0.5	30.1	66.8	0.0	1.9	0.0	0.2
Obstetrics & gynecology	6,638	38.0	100.0	0.0	0.0	0.0	0.0	0.4	10.6	87.0	0.0	0.4	0.1	1.5
Ophthalmology	7,024	58.1	100.0	0.3	0.1	0.0	0.0	0.5	20.9	77.7	0.0	0.1	0.0	0.4
Orthopedics	2,407	60.4	100.0	0.0	0.0	0.0	0.1	0.2	12.8	85.9	0.0	0.1	0.2	0.7
Otorhinolaryngology	4,096	50.4	100.0	2.8	0.0	0.0	0.0	0.5	10.4	83.2	0.0	0.6	0.0	2.4
Pathology	10,132	20.9	100.0	0.0	0.0	0.0	0.0	0.5	27.5	71.8	0.0	0.0	0.0	0.2
Pediatrics	9,118	23.3	100.0	0.1	0.1	0.0	0.0	0.4	16.7	76.5	0.0	3.0	0.4	2.9
Pharmacology	48,258	30.4	100.0	0.1	1.8	0.2	0.1	0.8	29.7	66.5	0.0	0.7	0.1	0.1
Pharmacy	1,708	18.1	100.0	0.1	9.8	0.1	0.1	1.2	15.2	71.7	0.4	0.4	0.0	0.9
Psychiatry	8,930	52.7	100.0	0.0	0.0	0.0	0.1	0.1	5.5	78.9	0.0	12.9	0.4	2.1
Radiology & nuclear medicine	14,956	55.6	100.0	1.8	0.6	0.1	0.1	0.1	7.4	89.1	0.6	0.0	0.0	0.1
Respiratory system	7,355	28.3	100.0	0.0	0.1	0.1	0.0	0.3	16.4	82.7	0.0	0.1	0.0	0.4
Surgery	15,743	47.0	100.0	0.1	0.0	0.0	0.0	0.3	9.3	89.7	0.0	0.1	0.0	0.5
Tropical medicine	908	21.8	100.0	0.3	0.3	0.1	0.0	4.7	30.5	61.1	0.1	0.1	0.4	2.2
Urology	8,320	50.3	100.0	0.0	0.0	0.0	0.0	0.1	9.3	90.0	0.0	0.1	0.0	0.4
Veterinary medicine	5,780	42.2	100.0	0.0	0.2	0.3	0.1	6.2	23.2	69.6	0.0	0.2	0.1	0.1
Misc. clinical medicine	1,645	26.6	100.0	0.1	0.0	0.0	0.1	0.3	21.8	71.7	0.0	1.6	0.6	3.9
Engineering														
Aerospace technology	770	64.4	100.0	16.8	0.8	1.7	1.4	0.0	0.1	0.1	79.0	0.0	0.1	0.0
Chemical engineering	2,337	46.1	100.0	9.1	27.2	4.0	0.2	0.9	4.3	0.6	53.4	0.0	0.1	0.3
Civil engineering	526	49.6	100.0	7.2	0.0	17.9	1.3	3.8	1.1	0.2	67.5	0.4	0.6	0.0
Computers	2,003	66.1	100.0	6.9	1.4	0.4	5.6	0.1	4.9	3.4	74.6	0.7	0.3	1.4
Electrical & electronic engineering	6,135	56.9	100.0	24.7	3.7	3.0	2.5	0.2	2.0	0.7	63.1	0.0	0.0	0.2
General engineering	158	14.6	100.0	39.2	3.2	7.6	3.8	2.5	2.5	0.0	41.1	0.0	0.0	0.0
Industrial engineering	78	17.9	100.0	0.0	0.0	0.0	3.8	0.0	1.3	0.0	59.0	0.0	0.0	35.9
Materials science	5,064	37.2	100.0	32.4	9.9	0.7	0.2	0.5	3.8	0.4	51.9	0.0	0.1	0.1
Mechanical engineering	3,256	54.0	100.0	15.6	4.9	1.8	2.2	0.2	1.3	0.5	73.6	0.0	0.1	0.0
Metals & metallurgy	2,777	41.7	100.0	23.2	8.9	0.7	0.3	0.1	2.1	0.4	64.2	0.0	0.0	0.0
Nuclear technology	2,080	51.4	100.0	28.0	1.5	2.7	0.4	0.4	1.2	7.9	56.1	0.0	1.4	0.3
Operations research	243	40.7	100.0	0.0	0.0	0.0	16.5	0.4	0.4	0.0	53.1	0.4	3.7	25.5
Misc. engineering & technology	890	29.1	100.0	14.3	2.6	12.4	0.6	4.0	4.8	0.6	57.0	0.0	3.5	0.3
Psychology														
Behavioral & comparative psychology	4,673	39.5	100.0	0.1	0.0	0.0	0.0	9.2	13.3	28.8	0.0	47.4	0.7	0.4
Clinical psychology	3,290	32.3	100.0	0.0	0.0	0.0	0.0	0.0	1.7	25.5	0.1	64.3	2.0	6.3
Developmental & child psychology	4,655	48.7	100.0	0.1	0.0	0.0	0.0	0.0	2.0	17.8	0.0	69.6	2.7	7.7
Experimental psychology	3,456	62.6	100.0	1.4	0.0	0.0	0.3	0.2	4.5	11.1	0.4	78.0	0.8	3.2
General psychology	1,143	25.3	100.0	0.3	0.0	0.0	0.1	0.0	1.9	17.2	0.0	60.1	4.5	15.8
Human factors	385	46.0	100.0	1.0	0.0	0.5	0.0	0.0	3.4	21.8	9.9	51.9	2.3	9.1
Psychoanalysis	230	36.5	100.0	0.0	0.0	0.0	0.0	0.0	1.3	34.8	0.0	60.0	0.9	3.0
Social psychology	4,181	48.6	100.0	0.0	0.0	0.0	0.0	0.1	0.9	6.7	0.1	77.6	4.5	10.1
Misc. psychology	3,431	34.3	100.0	0.1	0.0	0.1	0.7	0.1	3.2	17.2	0.1	61.5	5.0	12.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-54.
Distribution of citations in U.S. scientific and technical articles across broad and fine fields: 1997

Broad/fine field of citing article	Number of citations	Percentage of cited articles in: Same fine field	Total	Physics	Chemistry	Earth & space sciences	Mathe-matics	Biology	Biomedical research	Clinical medicine	Engineering & technology	Psychology	Social sciences	Health & professional
Social sciences														
Anthropology & archaeology	1,074	52.8	100.0	0.4	0.4	7.4	0.2	9.5	12.1	4.7	0.1	1.9	61.5	1.9
Area studies	374	28.3	100.0	0.0	0.0	0.3	0.3	0.0	0.5	1.1	0.5	0.0	89.8	7.5
Criminology	563	41.7	100.0	0.0	0.0	0.0	0.0	0.0	0.4	8.7	0.0	18.1	55.8	17.1
Demography	632	40.7	100.0	0.0	0.0	0.2	1.1	0.8	4.7	11.6	0.2	1.1	73.6	6.8
Economics	5,435	80.9	100.0	0.1	0.0	0.4	1.5	0.6	0.7	0.5	0.4	0.2	87.2	8.3
General social sciences	662	23.4	100.0	0.2	0.0	0.2	0.0	0.6	3.8	6.0	0.5	13.0	60.7	15.1
Geography & regional science	1,287	51.3	100.0	0.2	0.0	1.9	0.5	1.5	1.4	0.9	0.5	0.4	82.9	9.7
International relations	722	65.2	100.0	0.3	0.0	0.3	0.0	0.1	0.7	0.7	0.1	1.2	93.8	2.8
Planning & urban studies	192	29.2	100.0	3.1	0.0	2.1	0.0	11.5	3.1	1.0	0.5	3.1	62.0	13.5
Political science & public administration	1,158	58.7	100.0	0.0	0.0	0.3	0.4	0.2	0.4	0.8	0.0	1.3	90.7	5.9
Science studies	161	47.8	100.0	1.9	0.0	0.0	1.9	6.8	6.2	4.3	0.0	11.8	57.8	9.3
Sociology	2,249	51.5	100.0	0.0	0.0	0.1	0.4	0.1	0.5	2.4	0.1	9.5	75.1	11.8
Misc. social sciences	961	23.9	100.0	0.4	0.1	2.2	0.1	0.3	5.4	21.0	0.3	21.0	35.6	13.5
Health & professional														
Communication	457	59.7	100.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.2	17.1	8.8	73.5
Education	2,675	68.9	100.0	0.1	0.5	0.0	0.0	0.0	0.7	2.2	0.5	16.9	3.7	75.4
Gerontology & aging	744	18.5	100.0	0.0	0.1	0.0	0.0	0.0	1.7	36.3	0.0	16.8	10.2	34.8
Health policy & services	1,616	26.5	100.0	0.0	0.1	0.0	0.4	0.1	1.9	50.7	0.0	2.4	5.0	39.4
Information & library science	796	75.5	100.0	0.0	0.0	0.0	0.3	0.1	1.5	1.1	7.0	2.9	2.5	84.5
Law	5,269	78.2	100.0	0.0	0.0	0.2	0.0	0.1	0.5	3.5	0.1	2.0	9.5	84.0
Management & business	7,170	77.8	100.0	0.0	0.0	0.0	0.8	0.1	0.2	0.6	2.9	6.5	9.4	79.2
Nursing	778	33.0	100.0	0.0	0.0	0.0	0.0	0.1	2.4	36.4	0.0	10.5	1.8	48.7
Public health	2,617	22.8	100.0	0.0	0.0	0.5	0.6	0.3	4.7	47.8	0.1	7.6	5.1	33.4
Rehabilitation	1,110	53.2	100.0	0.0	0.0	0.1	0.0	0.1	1.7	16.3	0.1	16.8	1.7	63.2
Social studies of medicine	689	16.7	100.0	0.0	0.0	0.0	0.1	0.1	1.2	40.9	0.0	8.9	11.8	37.0
Social work	827	41.2	100.0	0.0	0.0	0.0	0.0	0.1	0.5	12.8	0.0	25.2	10.6	50.8
Speech, language pathology, audiology	661	53.0	100.0	9.1	0.0	0.0	0.2	0.0	1.7	10.0	0.5	17.5	0.3	60.8
Misc. professional fields	225	54.2	100.0	0.0	0.0	2.7	0.4	0.0	2.2	0.0	3.1	4.0	22.7	64.9

NOTES: Fields are determined by CHI Research, Inc. based on a classification of journals. Health & professional fields includes selected coverage of journals in the health sciences and professional fields, which are cited with particular frequency in the scientific and technical literature covered by ISI's Science and Social Science Citation Indexes.

SOURCES: Institute for Scientific Information, Science and Social Science Citation Indexes; CHI Research, Inc., Science Indicators database; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See page 6-45 in Volume 1.

Appendix table 6-55.
Scientific and technical articles, by country and field: 1986–97

Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97	Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97
Science and engineering									
World	459,175	480,801	500,682	515,708	Singapore	391	538	798	1,082
United States	175,563	180,074	179,219	173,233	Thailand	249	270	301	332
Japan	32,422	36,127	40,529	43,655	Malaysia	195	237	277	327
United Kingdom	36,998	36,741	38,763	39,670	Pakistan	189	229	254	254
Germany	29,365	30,971	32,746	35,294	Philippines	136	146	135	142
France	20,769	21,641	24,443	26,455	Bangladesh	111	101	133	141
Canada	20,943	21,506	21,974	20,989	Other Asia	346	366	358	406
Russia	0	0	19,294	17,589	New Zealand	1,977	2,004	2,111	2,260
Italy	10,502	12,351	14,255	16,256	Former USSR	31,239	31,453	24,388	22,155
Australia	9,929	10,135	10,888	11,830	Ukraine	0	0	2,728	2,428
Netherlands	8,321	9,479	10,363	10,914	Belarus	0	0	662	589
Sweden	7,523	7,773	7,786	8,227	Uzbekistan	0	0	273	296
Denmark	3,510	3,597	3,858	3,963	Estonia	0	0	175	219
Finland	2,808	2,944	3,328	3,786	Latvia	0	0	163	148
Norway	2,218	2,262	2,450	2,531	Lithuania	0	0	156	181
Switzerland	5,357	5,531	6,318	6,734	Armenia	0	0	162	166
Belgium	3,610	3,836	4,143	4,711	Other former USSR	0	0	775	538
Austria	2,289	2,577	2,842	3,269	Brazil	1,780	2,295	2,812	3,511
Ireland	764	832	915	1,096	Argentina	1,454	1,478	1,490	1,944
Spain	5,089	6,398	8,782	10,557	Mexico	894	1,012	1,276	1,758
Greece	1,223	1,443	1,675	2,014	Chile	653	743	743	808
Turkey	441	717	1,111	1,879	Venezuela	298	308	364	398
Portugal	392	546	735	968	Colombia	86	109	120	178
Yugoslavia	1,133	1,417	821	487	Cuba	66	94	113	147
Croatia	0	0	503	526	Other C. and S. America	389	448	458	493
Slovenia	0	0	395	440	Israel	4,932	4,740	4,955	5,227
Poland	3,929	3,850	3,664	4,127	Saudi Arabia	538	579	628	660
Czechoslovakia	2,936	2,883	3,063	0	Iran	91	99	176	286
Czech Republic	0	0	1,963	1,976	Jordan	142	158	127	157
Slovakia	0	0	1,076	1,026	Kuwait	256	283	109	171
Hungary	1,804	1,716	1,597	1,668	Other Near East	382	389	378	395
Bulgaria	1,134	1,158	1,134	889	South Africa	2,611	2,399	2,241	2,038
Romania	475	413	554	721	Egypt	1,079	1,263	1,219	1,192
Other Europe	110	150	229	301	Nigeria	911	763	530	401
India	9,335	9,075	9,201	8,668	Kenya	255	264	287	258
China	3,349	4,770	5,859	7,763	Morocco	83	106	163	244
Taiwan	1,133	2,018	3,507	4,781	Algeria	69	87	116	140
South Korea	653	1,140	2,034	3,960	Tunisia	85	106	111	158
Hong Kong	446	795	953	1,743	Other Africa	816	863	954	941

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-55.
Scientific and technical articles, by country and field: 1986–97

Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97	Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97
				Physics					
World	58,104	63,988	71,214	77,987	Singapore	38	41	107	174
United States	17,299	18,454	18,663	17,966	Thailand	8	6	9	14
Japan	5,352	6,367	7,707	9,235	Malaysia	8	16	15	16
United Kingdom	3,236	3,354	3,862	4,286	Pakistan	30	46	46	36
Germany	4,511	5,142	5,960	6,905	Philippines	1	3	6	7
France	3,519	3,536	4,247	4,816	Bangladesh	14	11	16	15
Canada	1,676	1,775	1,953	1,791	Other Asia	32	33	29	38
Russia	0	0	6,087	6,169	New Zealand	82	75	96	108
Italy	1,620	1,961	2,424	2,991	Former USSR	8,503	9,126	8,204	8,153
Australia	691	671	836	1,055	Ukraine	0	0	1,185	1,126
Netherlands	912	1,046	1,119	1,186	Belarus	0	0	298	279
Sweden	538	600	760	923	Uzbekistan	0	0	106	94
Denmark	300	306	390	459	Estonia	0	0	52	65
Finland	186	228	296	359	Latvia	0	0	54	49
Norway	109	110	155	168	Lithuania	0	0	67	76
Switzerland	859	938	1,079	1,235	Armenia	0	0	79	85
Belgium	428	471	546	684	Other former USSR	0	0	275	211
Austria	262	288	355	459	Brazil	350	461	619	805
Ireland	73	77	104	116	Argentina	245	263	269	358
Spain	601	787	1,166	1,502	Mexico	135	168	239	369
Greece	202	233	269	302	Chile	37	41	55	66
Turkey	49	61	104	182	Venezuela	52	49	61	56
Portugal	78	105	127	162	Colombia	2	7	15	28
Yugoslavia	219	248	156	102	Cuba	13	13	18	23
Croatia	0	0	86	77	Other C. and S. America	11	17	17	30
Slovenia	0	0	86	101	Israel	604	601	754	918
Poland	1,047	1,062	1,051	1,279	Saudi Arabia	35	34	48	55
Czechoslovakia	335	393	432	0	Iran	7	11	22	40
Czech Republic	0	0	320	329	Jordan	17	15	19	25
Slovakia	0	0	198	150	Kuwait	11	14	5	11
Hungary	193	215	239	281	Other Near East	31	36	25	30
Bulgaria	179	199	227	211	South Africa	141	140	172	126
Romania	96	90	144	230	Egypt	99	132	146	158
Other Europe	9	11	19	34	Nigeria	20	11	12	11
India	1,510	1,552	1,690	1,748	Kenya	3	3	2	2
China	1,115	1,665	2,122	2,688	Morocco	9	11	33	52
Taiwan	177	326	604	845	Algeria	15	24	32	48
South Korea	109	234	468	1,055	Tunisia	13	8	9	21
Hong Kong	30	43	99	256	Other Africa	18	23	30	32

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-55.
Scientific and technical articles, by country and field: 1986–97

Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97	Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97
Chemistry									
World	57,238	59,398	62,007	64,569	Singapore	43	79	107	132
United States	12,974	13,494	13,709	13,545	Thailand	12	15	16	25
Japan	6,037	6,418	6,646	6,964	Malaysia	29	33	63	99
United Kingdom	3,451	3,405	3,602	3,819	Pakistan	41	42	53	54
Germany	4,931	5,043	5,369	5,734	Philippines	5	4	3	2
France	3,256	3,355	3,633	3,732	Bangladesh	12	13	19	23
Canada	1,769	1,763	1,892	1,878	Other Asia	26	26	30	33
Russia	0	0	5,137	4,454	New Zealand	127	152	144	170
Italy	1,603	1,735	1,909	2,024	Former USSR	8,311	8,185	6,843	5,652
Australia	832	800	867	994	Ukraine	0	0	680	550
Netherlands	880	945	987	1,000	Belarus	0	0	188	154
Sweden	558	585	655	713	Uzbekistan	0	0	102	166
Denmark	177	200	251	289	Estonia	0	0	25	32
Finland	190	183	221	295	Latvia	0	0	58	49
Norway	187	148	182	205	Lithuania	0	0	32	40
Switzerland	625	668	793	861	Armenia	0	0	25	28
Belgium	431	424	518	579	Other former USSR	0	0	235	179
Austria	280	295	325	351	Brazil	200	182	276	407
Ireland	80	102	106	101	Argentina	240	233	233	268
Spain	1,374	1,466	1,912	2,114	Mexico	90	89	124	208
Greece	193	230	252	285	Chile	70	83	92	97
Turkey	82	125	183	330	Venezuela	47	44	56	77
Portugal	73	91	139	181	Colombia	2	4	4	13
Yugoslavia	247	279	195	98	Cuba	12	18	17	29
Croatia	0	0	129	144	Other C. and S. America	19	20	27	31
Slovenia	0	0	86	102	Israel	324	313	321	366
Poland	1,172	1,070	1,067	1,221	Saudi Arabia	67	66	60	67
Czechoslovakia	916	901	866	0	Iran	15	22	46	94
Czech Republic	0	0	576	590	Jordan	33	38	14	29
Slovakia	0	0	293	311	Kuwait	30	27	8	26
Hungary	493	491	441	511	Other Near East	91	97	58	46
Bulgaria	219	252	297	259	South Africa	252	248	228	203
Romania	180	174	234	269	Egypt	427	526	482	439
Other Europe	4	12	23	34	Nigeria	60	58	40	36
India	2,402	2,472	2,448	2,370	Kenya	2	1	3	2
China	503	754	1,118	1,876	Morocco	20	31	47	71
Taiwan	166	351	592	780	Algeria	13	22	25	34
South Korea	231	346	572	993	Tunisia	19	36	29	41
Hong Kong	42	75	104	217	Other Africa	43	44	41	29

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-55.
Scientific and technical articles, by country and field: 1986–97

Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97	Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97
Earth and space sciences									
World	20,196	21,441	23,798	26,337	Singapore	17	16	18	27
United States	8,370	8,488	9,161	9,825	Thailand	11	12	11	14
Japan	698	776	888	1,025	Malaysia	8	9	12	15
United Kingdom	1,468	1,537	1,803	2,101	Pakistan	8	6	9	7
Germany	994	1,167	1,302	1,581	Philippines	4	5	4	8
France	1,028	1,058	1,196	1,542	Bangladesh	3	2	3	4
Canada	1,326	1,463	1,542	1,564	Other Asia	25	33	27	29
Russia	0	0	1,118	951	New Zealand	129	163	159	174
Italy	396	543	668	800	Former USSR	1,423	1,427	1,338	1,136
Australia	687	676	764	789	Ukraine	0	0	112	103
Netherlands	355	405	502	555	Belarus	0	0	13	7
Sweden	232	270	282	356	Uzbekistan	0	0	10	6
Denmark	97	110	167	229	Estonia	0	0	25	22
Finland	91	117	138	175	Latvia	0	0	7	7
Norway	142	176	203	219	Lithuania	0	0	3	5
Switzerland	160	170	233	292	Armenia	0	0	10	10
Belgium	106	114	137	180	Other former USSR	0	0	40	25
Austria	56	79	83	112	Brazil	123	152	156	173
Ireland	34	37	35	48	Argentina	64	75	76	96
Spain	167	300	395	530	Mexico	73	75	91	134
Greece	97	119	145	152	Chile	56	64	69	70
Turkey	32	55	69	111	Venezuela	16	14	21	19
Portugal	16	27	27	44	Colombia	4	4	3	9
Yugoslavia	46	66	37	17	Cuba	1	4	2	2
Croatia	0	0	30	28	Other C. and S. America	19	19	24	26
Slovenia	0	0	14	17	Israel	168	154	189	183
Poland	76	101	112	142	Saudi Arabia	21	32	28	28
Czechoslovakia	122	104	130	0	Iran	5	6	9	9
Czech Republic	0	0	75	96	Jordan	5	7	6	9
Slovakia	0	0	48	34	Kuwait	15	18	9	13
Hungary	40	43	48	61	Other Near East	22	21	22	23
Bulgaria	27	31	35	34	South Africa	192	186	193	208
Romania	6	6	15	13	Egypt	44	55	56	52
Other Europe	18	18	21	27	Nigeria	36	29	25	16
India	527	483	494	424	Kenya	4	8	10	7
China	201	198	205	320	Morocco	7	5	10	14
Taiwan	15	32	77	190	Algeria	4	2	6	6
South Korea	16	20	44	91	Tunisia	7	5	3	6
Hong Kong	6	15	23	52	Other Africa	31	32	36	41

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-55.
Scientific and technical articles, by country and field: 1986–97

Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97	Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97
Mathematics									
World	8,618	8,710	8,859	8,916	Singapore	12	16	26	45
United States	3,440	3,511	3,311	2,959	Thailand	1	0	0	0
Japan	373	391	344	346	Malaysia	3	4	4	2
United Kingdom	616	516	529	523	Pakistan	2	3	4	2
Germany	609	579	582	595	Philippines	1	1	1	1
France	479	511	789	917	Bangladesh	1	1	0	1
Canada	411	423	409	387	Other Asia	13	20	15	24
Russia	0	0	185	186	New Zealand	29	29	31	31
Italy	247	288	281	333	Former USSR	346	339	246	248
Australia	193	167	176	193	Ukraine	0	0	26	31
Netherlands	141	156	148	137	Belarus	0	0	10	9
Sweden	79	66	75	89	Uzbekistan	0	0	2	2
Denmark	50	50	47	54	Estonia	0	0	1	2
Finland	46	35	40	38	Latvia	0	0	1	2
Norway	37	32	34	35	Lithuania	0	0	4	2
Switzerland	75	69	86	85	Armenia	0	0	6	3
Belgium	73	74	69	79	Other former USSR	0	0	13	12
Austria	56	62	54	54	Brazil	59	63	70	80
Ireland	25	21	18	21	Argentina	16	16	20	24
Spain	125	149	196	256	Mexico	24	25	20	25
Greece	47	48	47	49	Chile	13	16	16	20
Turkey	11	10	11	16	Venezuela	8	10	13	14
Portugal	13	18	21	25	Colombia	1	0	3	2
Yugoslavia	30	29	19	9	Cuba	0	0	1	2
Croatia	0	0	11	12	Other C. and S. America	3	3	5	5
Slovenia	0	0	11	14	Israel	159	138	151	169
Poland	132	136	104	103	Saudi Arabia	14	11	11	13
Czechoslovakia	36	48	62	0	Iran	7	4	6	6
Czech Republic	0	0	44	33	Jordan	4	2	3	3
Slovakia	0	0	11	20	Kuwait	9	10	2	4
Hungary	85	67	61	43	Other Near East	4	8	6	9
Bulgaria	25	32	29	27	South Africa	42	31	27	26
Romania	36	31	32	41	Egypt	10	8	13	10
Other Europe	3	1	5	6	Nigeria	13	4	3	5
India	129	117	103	96	Kenya	0	2	1	0
China	130	206	272	306	Morocco	3	5	9	18
Taiwan	30	39	51	87	Algeria	3	3	6	5
South Korea	14	24	33	67	Tunisia	6	6	6	10
Hong Kong	10	21	21	47	Other Africa	8	8	9	7

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-55.
Scientific and technical articles, by country and field: 1986–97

Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97	Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97
					Biology				
World	35,605	36,895	36,487	37,017	Singapore	26	35	40	44
United States	13,325	13,692	12,325	11,388	Thailand	29	40	48	55
Japan	2,343	2,524	2,654	2,625	Malaysia	42	45	55	57
United Kingdom	3,056	2,719	2,671	2,779	Pakistan	51	59	55	40
Germany	1,937	1,959	1,729	1,942	Philippines	78	79	77	78
France	1,162	1,273	1,428	1,503	Bangladesh	14	13	16	18
Canada	3,038	2,987	2,813	2,524	Other Asia	76	71	76	88
Russia	0	0	675	885	New Zealand	506	480	491	550
Italy	397	501	597	756	Former USSR	823	807	812	1,029
Australia	1,676	1,806	1,858	1,830	Ukraine	0	0	53	56
Netherlands	711	791	854	896	Belarus	0	0	18	16
Sweden	506	545	591	581	Uzbekistan	0	0	5	5
Denmark	215	252	325	388	Estonia	0	0	14	27
Finland	210	234	275	345	Latvia	0	0	3	5
Norway	246	268	285	303	Lithuania	0	0	3	7
Switzerland	225	255	293	323	Armenia	0	0	5	4
Belgium	210	234	244	335	Other former USSR	0	0	36	25
Austria	122	143	165	164	Brazil	159	187	264	343
Ireland	88	83	68	105	Argentina	151	180	194	302
Spain	410	617	955	1,202	Mexico	119	149	219	261
Greece	105	125	142	180	Chile	65	77	74	91
Turkey	24	40	53	88	Venezuela	32	40	51	53
Portugal	25	43	72	105	Colombia	29	36	39	42
Yugoslavia	38	54	38	28	Cuba	8	15	12	16
Croatia	0	0	24	23	Other C. and S. America	103	118	123	128
Slovenia	0	0	17	22	Israel	445	457	440	411
Poland	222	223	206	201	Saudi Arabia	36	36	44	36
Czechoslovakia	144	145	194	0	Iran	14	11	13	18
Czech Republic	0	0	145	138	Jordan	12	12	11	13
Slovakia	0	0	33	40	Kuwait	11	18	6	9
Hungary	74	80	84	81	Other Near East	50	55	58	62
Bulgaria	23	35	51	62	South Africa	415	420	403	368
Romania	6	4	7	8	Egypt	128	131	103	99
Other Europe	17	18	28	32	Nigeria	220	187	130	110
India	891	827	751	603	Kenya	51	52	64	65
China	120	167	201	305	Morocco	14	22	18	20
Taiwan	96	150	218	261	Algeria	8	7	7	8
South Korea	25	32	55	119	Tunisia	5	7	8	12
Hong Kong	12	25	21	78	Other Africa	190	200	238	227

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-55.
Scientific and technical articles, by country and field: 1986–97

Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97	Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97
Biomedical research									
World	69,463	73,690	75,866	77,018	Singapore	33	57	86	110
United States	26,674	28,537	29,561	29,401	Thailand	49	40	53	41
Japan	4,899	5,544	6,119	6,352	Malaysia	21	28	30	30
United Kingdom	5,396	5,554	5,958	6,039	Pakistan	11	15	13	17
Germany	4,370	4,704	4,724	5,202	Philippines	11	13	12	14
France	3,487	3,690	4,127	4,312	Bangladesh	13	11	17	14
Canada	2,910	3,122	3,241	3,119	Other Asia	27	29	28	38
Russia	0	0	2,649	2,485	New Zealand	211	209	232	223
Italy	1,408	1,697	2,007	2,216	Former USSR	5,668	5,288	3,021	2,798
Australia	1,304	1,388	1,456	1,536	Ukraine	0	0	170	121
Netherlands	1,367	1,510	1,722	1,680	Belarus	0	0	51	58
Sweden	1,281	1,385	1,338	1,305	Uzbekistan	0	0	15	12
Denmark	560	608	680	692	Estonia	0	0	21	21
Finland	402	419	443	488	Latvia	0	0	13	17
Norway	319	315	327	314	Lithuania	0	0	18	22
Switzerland	927	973	1,152	1,165	Armenia	0	0	17	21
Belgium	610	686	713	777	Other former USSR	0	0	67	41
Austria	267	309	361	443	Brazil	289	462	492	600
Ireland	80	118	119	180	Argentina	247	228	217	297
Spain	975	1,177	1,400	1,565	Mexico	131	139	183	251
Greece	107	119	126	167	Chile	105	105	95	105
Turkey	25	39	66	135	Venezuela	54	48	53	59
Portugal	47	77	103	136	Colombia	9	13	11	23
Yugoslavia	167	218	75	36	Cuba	12	13	28	23
Croatia	0	0	44	35	Other C. and S. America	42	51	64	74
Slovenia	0	0	54	53	Israel	672	642	697	674
Poland	389	413	344	340	Saudi Arabia	41	34	33	48
Czechoslovakia	403	425	490	0	Iran	8	4	8	12
Czech Republic	0	0	289	298	Jordan	6	11	10	9
Slovakia	0	0	179	161	Kuwait	41	38	9	16
Hungary	370	331	257	224	Other Near East	26	18	23	31
Bulgaria	501	420	291	100	South Africa	342	331	298	273
Romania	33	24	21	27	Egypt	62	68	70	65
Other Europe	10	14	27	28	Nigeria	81	70	41	45
India	1,408	1,147	1,108	1,179	Kenya	37	37	33	30
China	274	335	383	411	Morocco	5	6	10	15
Taiwan	91	162	300	437	Algeria	5	4	6	8
South Korea	35	78	159	322	Tunisia	4	7	9	13
Hong Kong	41	67	68	108	Other Africa	65	69	69	81

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-55.
Scientific and technical articles, by country and field: 1986–97

Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97	Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97
Clinical medicine									
World	136,755	141,709	145,420	147,744	Singapore	114	134	180	200
United States	54,968	55,339	55,326	54,154	Thailand	97	117	127	144
Japan	8,739	10,201	11,930	12,868	Malaysia	58	68	70	69
United Kingdom	13,647	13,805	13,995	13,409	Pakistan	18	33	40	62
Germany	8,473	8,789	9,311	9,793	Philippines	15	20	15	17
France	6,100	6,356	6,875	7,275	Bangladesh	28	30	31	33
Canada	5,520	5,560	5,703	5,610	Other Asia	91	94	99	100
Russia	0	0	1,873	799	New Zealand	620	620	643	658
Italy	4,118	4,695	5,248	5,801	Former USSR	4,333	4,199	2,254	988
Australia	2,935	3,058	3,273	3,499	Ukraine	0	0	189	87
Netherlands	3,057	3,487	3,721	4,079	Belarus	0	0	38	19
Sweden	3,707	3,635	3,383	3,466	Uzbekistan	0	0	24	5
Denmark	1,902	1,836	1,718	1,572	Estonia	0	0	24	39
Finland	1,418	1,410	1,567	1,702	Latvia	0	0	15	9
Norway	930	931	963	936	Lithuania	0	0	14	12
Switzerland	2,004	1,972	2,170	2,275	Armenia	0	0	14	8
Belgium	1,399	1,472	1,520	1,594	Other former USSR	0	0	64	10
Austria	1,035	1,168	1,229	1,389	Brazil	367	538	651	761
Ireland	278	300	351	395	Argentina	385	368	360	459
Spain	1,123	1,514	2,122	2,635	Mexico	244	271	273	356
Greece	251	319	404	578	Chile	262	314	295	303
Turkey	134	258	456	771	Venezuela	64	65	80	76
Portugal	76	99	127	166	Colombia	27	30	30	40
Yugoslavia	255	346	177	103	Cuba	16	21	26	39
Croatia	0	0	116	124	Other C. and S. America	112	134	136	147
Slovenia	0	0	68	70	Israel	1,691	1,621	1,649	1,675
Poland	506	470	406	489	Saudi Arabia	216	250	265	282
Czechoslovakia	528	475	465	0	Iran	20	25	45	77
Czech Republic	0	0	226	229	Jordan	33	41	34	40
Slovakia	0	0	159	153	Kuwait	87	94	33	43
Hungary	414	340	324	330	Other Near East	87	77	112	126
Bulgaria	90	102	90	95	South Africa	946	797	631	556
Romania	41	29	24	28	Egypt	157	182	181	206
Other Europe	36	50	65	86	Nigeria	288	261	187	129
India	1,178	1,205	1,205	1,066	Kenya	132	137	154	133
China	522	670	621	657	Morocco	12	15	18	35
Taiwan	216	367	731	1,077	Algeria	12	11	13	9
South Korea	59	115	233	506	Tunisia	27	33	41	44
Hong Kong	198	383	394	539	Other Africa	345	356	407	418

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-55.
Scientific and technical articles, by country and field: 1986–97

Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97	Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97
Engineering & technology									
World	29,839	31,655	35,228	35,807	Singapore	62	105	164	274
United States	11,268	11,735	12,218	11,173	Thailand	16	15	17	25
Japan	3,572	3,430	3,767	3,744	Malaysia	7	14	12	20
United Kingdom	2,219	2,139	2,324	2,319	Pakistan	19	12	21	18
Germany	2,083	2,158	2,315	2,135	Philippines	3	1	2	2
France	992	1,163	1,413	1,612	Bangladesh	6	6	11	14
Canada	1,605	1,637	1,785	1,645	Other Asia	12	13	13	17
Russia	0	0	1,052	1,290	New Zealand	69	70	74	82
Italy	470	653	817	1,009	Former USSR	1,405	1,496	1,449	1,742
Australia	461	435	549	659	Ukraine	0	0	280	338
Netherlands	314	423	498	475	Belarus	0	0	38	40
Sweden	292	309	334	400	Uzbekistan	0	0	7	5
Denmark	77	98	118	128	Estonia	0	0	8	6
Finland	119	149	179	190	Latvia	0	0	8	9
Norway	86	96	108	133	Lithuania	0	0	14	16
Switzerland	254	268	289	281	Armenia	0	0	3	7
Belgium	149	153	202	256	Other former USSR	0	0	39	31
Austria	89	122	132	161	Brazil	78	107	141	186
Ireland	29	30	48	48	Argentina	69	69	72	95
Spain	210	264	420	496	Mexico	35	47	63	78
Greece	168	187	220	216	Chile	22	20	19	29
Turkey	64	94	129	190	Venezuela	14	20	17	24
Portugal	45	62	91	113	Colombia	3	2	2	7
Yugoslavia	95	125	104	87	Cuba	2	3	3	10
Croatia	0	0	27	21	Other C. and S. America	10	11	14	10
Slovenia	0	0	45	48	Israel	305	283	302	350
Poland	302	292	298	290	Saudi Arabia	88	92	116	104
Czechoslovakia	125	135	198	0	Iran	11	10	21	26
Czech Republic	0	0	118	127	Jordan	20	23	18	23
Slovakia	0	0	41	53	Kuwait	40	51	30	36
Hungary	54	75	66	76	Other Near East	58	58	55	45
Bulgaria	63	69	93	86	South Africa	134	96	111	87
Romania	71	49	69	98	Egypt	136	148	153	150
Other Europe	3	4	15	19	Nigeria	39	33	17	11
India	1,005	935	1,080	962	Kenya	1	3	3	2
China	405	689	876	1,120	Morocco	7	8	16	19
Taiwan	282	502	839	977	Algeria	6	11	20	20
South Korea	139	254	411	720	Tunisia	2	2	4	9
Hong Kong	33	73	113	208	Other Africa	14	19	18	19

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-55.
Scientific and technical articles, by country and field: 1986–97

Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97	Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97
					Psychology				
World	11,665	11,248	10,766	10,866	Singapore	5	6	9	5
United States	7,153	6,759	6,254	6,010	Thailand	1	2	0	2
Japan	176	191	204	233	Malaysia	2	1	1	2
United Kingdom	837	759	803	889	Pakistan	0	2	1	1
Germany	544	521	526	531	Philippines	2	2	1	1
France	229	224	213	255	Bangladesh	1	1	1	0
Canada	885	875	851	813	Other Asia	4	3	3	2
Russia	0	0	115	129	New Zealand	80	59	78	91
Italy	83	90	89	118	Former USSR	185	182	125	142
Australia	324	321	314	326	Ukraine	0	0	6	7
Netherlands	216	271	282	325	Belarus	0	0	2	1
Sweden	97	116	120	129	Uzbekistan	0	0	0	0
Denmark	29	26	36	28	Estonia	0	0	2	2
Finland	39	43	56	66	Latvia	0	0	1	1
Norway	46	47	48	58	Lithuania	0	0	0	0
Switzerland	80	75	72	75	Armenia	0	0	0	1
Belgium	58	65	54	69	Other former USSR	0	0	1	1
Austria	25	31	34	40	Brazil	54	42	24	22
Ireland	9	9	8	13	Argentina	10	17	13	13
Spain	33	49	73	85	Mexico	10	18	21	22
Greece	5	5	8	9	Chile	5	5	4	4
Turkey	4	6	9	8	Venezuela	3	4	3	9
Portugal	3	5	4	8	Colombia	2	5	6	5
Yugoslavia	10	12	3	2	Cuba	0	2	1	1
Croatia	0	0	3	8	Other C. and S. America	7	5	4	5
Slovenia	0	0	4	2	Israel	155	140	142	139
Poland	17	19	16	13	Saudi Arabia	2	2	1	1
Czechoslovakia	97	56	70	0	Iran	0	2	2	1
Czech Republic	0	0	43	48	Jordan	1	1	3	0
Slovakia	0	0	47	49	Kuwait	2	3	2	4
Hungary	10	10	12	12	Other Near East	2	0	3	4
Bulgaria	3	5	1	2	South Africa	30	31	42	40
Romania	2	2	0	1	Egypt	3	2	1	1
Other Europe	2	3	3	6	Nigeria	12	6	6	2
India	33	39	33	19	Kenya	4	2	2	2
China	4	12	9	11	Morocco	0	1	0	0
Taiwan	4	13	11	15	Algeria	1	0	0	0
South Korea	2	2	7	9	Tunisia	0	0	0	0
Hong Kong	18	33	26	52	Other Africa	6	12	10	7

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-55.
Scientific and technical articles, by country and field: 1986–97

Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97	Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97
Social sciences									
World	15,841	16,122	15,669	14,764	Singapore	26	29	34	39
United States	8,665	8,878	8,185	7,378	Thailand	16	14	12	8
Japan	175	202	203	184	Malaysia	12	13	8	11
United Kingdom	1,698	1,633	1,771	1,924	Pakistan	6	9	8	10
Germany	608	600	657	565	Philippines	13	14	11	9
France	402	357	393	370	Bangladesh	17	14	16	17
Canada	979	1,023	926	885	Other Asia	27	29	25	26
Russia	0	0	270	202	New Zealand	65	78	84	83
Italy	112	117	146	137	Former USSR	185	252	303	220
Australia	526	475	474	496	Ukraine	0	0	12	7
Netherlands	226	270	308	320	Belarus	0	0	5	3
Sweden	130	146	126	131	Uzbekistan	0	0	2	0
Denmark	68	71	88	78	Estonia	0	0	5	3
Finland	51	55	42	39	Latvia	0	0	3	0
Norway	91	93	100	109	Lithuania	0	0	1	2
Switzerland	106	95	108	91	Armenia	0	0	2	0
Belgium	94	83	82	94	Other former USSR	0	0	4	3
Austria	71	63	81	74	Brazil	42	35	47	49
Ireland	47	41	39	46	Argentina	24	22	26	25
Spain	52	49	89	110	Mexico	26	22	27	36
Greece	29	43	42	45	Chile	12	10	13	13
Turkey	10	17	17	31	Venezuela	6	7	4	4
Portugal	8	7	13	17	Colombia	3	6	4	5
Yugoslavia	15	27	11	2	Cuba	2	4	5	2
Croatia	0	0	30	51	Other C. and S. America	51	49	28	22
Slovenia	0	0	8	7	Israel	231	223	182	188
Poland	35	46	43	32	Saudi Arabia	5	7	2	5
Czechoslovakia	224	194	148	0	Iran	4	2	2	1
Czech Republic	0	0	121	82	Jordan	6	6	6	4
Slovakia	0	0	66	54	Kuwait	3	5	3	4
Hungary	49	42	48	32	Other Near East	4	11	7	10
Bulgaria	3	7	11	7	South Africa	80	76	94	99
Romania	4	3	3	5	Egypt	10	8	8	8
Other Europe	5	8	14	17	Nigeria	59	57	36	15
India	195	236	235	154	Kenya	11	12	11	10
China	53	43	28	36	Morocco	3	1	2	1
Taiwan	52	67	63	67	Algeria	3	3	1	1
South Korea	16	17	29	39	Tunisia	1	2	1	1
Hong Kong	29	31	42	87	Other Africa	64	66	60	43

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-55.
Scientific and technical articles, by country and field: 1986–97

Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97	Region/country	Average annual number of articles published in: 1986–88	1989–91	1992–94	1995–97
					Health & professional				
World	15,852	15,945	15,370	14,685	Singapore	15	21	25	33
United States	11,427	11,187	10,504	9,434	Thailand	8	8	8	5
Japan	60	82	66	78	Malaysia	7	8	7	7
United Kingdom	1,375	1,321	1,446	1,582	Pakistan	3	3	4	5
Germany	303	312	272	309	Philippines	3	4	3	4
France	116	119	127	121	Bangladesh	3	1	3	3
Canada	825	876	860	772	Other Asia	13	14	12	11
Russia	0	0	134	39	New Zealand	60	70	80	90
Italy	47	71	70	71	Former USSR	57	154	152	48
Australia	300	339	321	451	Ukraine	0	0	13	3
Netherlands	142	176	223	259	Belarus	0	0	2	2
Sweden	102	115	123	134	Uzbekistan	0	0	1	0
Denmark	35	39	39	45	Estonia	0	0	0	1
Finland	56	71	70	90	Latvia	0	0	2	0
Norway	27	47	46	52	Lithuania	0	0	0	1
Switzerland	42	48	45	51	Armenia	0	0	0	0
Belgium	51	60	58	63	Other former USSR	0	0	2	1
Austria	26	19	23	23	Brazil	59	67	72	85
Ireland	21	15	19	24	Argentina	3	6	10	7
Spain	19	28	55	63	Mexico	7	11	17	17
Greece	19	16	20	31	Chile	6	8	10	10
Turkey	7	12	15	19	Venezuela	2	7	4	7
Portugal	8	12	13	12	Colombia	4	1	2	4
Yugoslavia	12	13	5	3	Cuba	0	2	1	1
Croatia	0	0	6	3	Other C. and S. America	13	21	15	15
Slovenia	0	0	6	5	Israel	177	169	128	154
Poland	33	19	18	16	Saudi Arabia	13	16	20	22
Czechoslovakia	7	7	9	0	Iran	1	2	4	1
Czech Republic	0	0	5	6	Jordan	6	4	3	2
Slovakia	0	0	2	1	Kuwait	6	5	3	3
Hungary	21	23	18	18	Other Near East	8	8	9	9
Bulgaria	2	7	9	6	South Africa	36	45	42	52
Romania	1	1	4	2	Egypt	3	4	6	4
Other Europe	5	9	9	13	Nigeria	83	47	33	23
India	57	62	54	47	Kenya	9	7	4	4
China	22	32	23	33	Morocco	2	2	1	1
Taiwan	5	12	23	43	Algeria	1	2	0	1
South Korea	9	17	22	38	Tunisia	1	0	1	1
Hong Kong	28	30	42	98	Other Africa	32	33	37	38

NOTES: Article counts are based on fractional assignments; for example, an article with two authors from different countries is counted as one-half article to each country. Articles are assigned to fields based on journal field classifications developed by CHI Research, Inc. based on a classification of journals covered by the Institute for Scientific Information's Science and Social Science Citation Indexes (SCI, SSCI). Articles in health science and professional journals are included because of their close ties to the social sciences and psychology. Former USSR is the combination of the former republics, and their "1992-94" averages refer to 1993-1994 only; the same is true for these averages for Croatia, Slovenia, and Bosnia and Macedonia (included in other Europe). For Czech Republic and Slovakia, "1992-94" refers to 1994 only. German data are combined for all years. Details do not add to World averages because of the various bases for the 1992-94 country averages.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Science Citation Index; CHI Research, Inc., Science Indicators database; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See figure 6-32 and page 6-45 in Volume 1.

Appendix table 6-56.
Percentage of world's scientific and technical articles in a set of major international journals, by country: 1986–97

Region/country	Percent of articles published in: 1986–88	1989–91	1992–94	1995–97	Region/country	Percent of articles published in: 1986–88	1989–91	1992–94	1995–97
Science and engineering									
World	100.0	100.0	100.0	100.0	Singapore	0.1	0.1	0.2	0.2
United States	38.2	37.5	35.8	33.6	Thailand	0.1	0.1	0.1	0.1
Japan	7.1	7.5	8.1	8.5	Malaysia	0.0	0.0	0.1	0.1
United Kingdom	8.1	7.6	7.7	7.7	Pakistan	0.0	0.0	0.1	0.0
Germany	6.4	6.4	6.5	6.8	Philippines	0.0	0.0	0.0	0.0
France	4.5	4.5	4.9	5.1	Bangladesh	0.0	0.0	0.0	0.0
Canada	4.6	4.5	4.4	4.1	Other Asia	0.1	0.1	0.1	0.1
Russia	NA	NA	3.9	3.4	New Zealand	0.4	0.4	0.4	0.4
Italy	2.3	2.6	2.8	3.2	Former USSR, total	6.8	6.5	4.9	4.3
Australia	2.2	2.1	2.2	2.3	Ukraine	NA	NA	0.5	0.5
Netherlands	1.8	2.0	2.1	2.1	Belarus	NA	NA	0.1	0.1
Sweden	1.6	1.6	1.6	1.6	Uzbekistan	NA	NA	0.1	0.1
Denmark	0.8	0.7	0.8	0.8	Estonia	NA	NA	0.0	0.0
Finland	0.6	0.6	0.7	0.7	Latvia	NA	NA	0.0	0.0
Norway	0.5	0.5	0.5	0.5	Lithuania	NA	NA	0.0	0.0
Switzerland	1.2	1.2	1.3	1.3	Armenia	NA	NA	0.0	0.0
Belgium	0.8	0.8	0.8	0.9	Other former USSR	NA	NA	0.2	0.1
Austria	0.5	0.5	0.6	0.6	Brazil	0.4	0.5	0.6	0.7
Ireland	0.2	0.2	0.2	0.2	Argentina	0.3	0.3	0.3	0.4
Spain	1.1	1.3	1.8	2.0	Mexico	0.2	0.2	0.3	0.3
Greece	0.3	0.3	0.3	0.4	Chile	0.1	0.2	0.1	0.2
Turkey	0.1	0.1	0.2	0.4	Venezuela	0.1	0.1	0.1	0.1
Portugal	0.1	0.1	0.1	0.2	Colombia	0.0	0.0	0.0	0.0
Yugoslavia	0.2	0.3	0.2	0.1	Cuba	0.0	0.0	0.0	0.0
Croatia	NA	NA	0.1	0.1	Other C. and S. America	0.1	0.1	0.1	0.1
Slovenia	NA	NA	0.1	0.1	Israel	1.1	1.0	1.0	1.0
Poland	0.9	0.8	0.7	0.8	Saudi Arabia	0.1	0.1	0.1	0.1
Czechoslovakia	0.6	0.6	0.6	NA	Iran	0.0	0.0	0.0	0.1
Czech Republic	NA	NA	0.4	0.4	Jordan	0.0	0.0	0.0	0.0
Slovakia	NA	NA	0.2	0.2	Kuwait	0.1	0.1	0.0	0.0
Hungary	0.4	0.4	0.3	0.3	Other Near East	0.1	0.1	0.1	0.1
Bulgaria	0.2	0.2	0.2	0.2	South Africa	0.6	0.5	0.4	0.4
Romania	0.1	0.1	0.1	0.1	Egypt	0.2	0.3	0.2	0.2
Other Europe	0.0	0.0	0.0	0.1	Nigeria	0.2	0.2	0.1	0.1
India	2.0	1.9	1.8	1.7	Kenya	0.1	0.1	0.1	0.1
China	0.7	1.0	1.2	1.5	Morocco	0.0	0.0	0.0	0.0
Taiwan	0.2	0.4	0.7	0.9	Algeria	0.0	0.0	0.0	0.0
South Korea	0.1	0.2	0.4	0.8	Tunisia	0.0	0.0	0.0	0.0
Hong Kong	0.1	0.2	0.2	0.3	Other Africa	0.2	0.2	0.2	0.2

NA = not applicable

NOTES: Article counts are based on fractional assignments; for example, an article with two authors from different countries is counted as one-half article to each country. Former USSR is the combination of the former republics, and their "1992-94" averages refer to 1993-1994 only; the same is true for these averages for Croatia, Slovenia, and Bosnia and Macedonia (included in other Europe). For Czech Republic and Slovakia, "1992-94" refers to 1994 only. German data are combined for all years. Details do not add to World averages because of the various bases for the 1992-94 country averages.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Science Citation Index; CHI Research, Inc., Science Indicators database; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See figure 6-33 in Volume 1.

Appendix table 6-57.
Gross domestic product and scientific and technical articles for selected countries: 1997

Country	GDP (U.S. $ Billions)	Articles	Articles/ GDP ($ Billions)	Rank	GDP (log)	Articles (log)	Country	GDP (U.S. $ Billions)	Articles	Articles/ GDP ($ Billions)	Rank	GDP (log)	Articles (log)
United States	8,083.0	176,141	21.8	28	3.9076	5.2459	Hong Kong	175.2	2,548	14.5	38	2.2435	3.4062
Japan	3,080.0	48,063	15.6	37	3.4886	4.6818	Singapore	84.6	1,353	16.0	36	1.9274	3.1313
United Kingdom	1,242.0	45,231	36.4	9	3.0941	4.6554	Thailand	525.0	536	1.0	67	2.7202	2.7292
Germany	1,740.0	45,006	25.9	21	3.2405	4.6533	Malaysia	227.0	404	1.8	63	2.3560	2.6064
France	1,320.0	33,295	25.2	23	3.1206	4.5224	Pakistan	344.0	292	0.8	68	2.5366	2.4654
Canada	658.0	23,560	35.8	10	2.8182	4.3722	Philippines	244.0	251	1.0	66	2.3874	2.3997
Russia	692.0	20,473	29.6	16	2.8401	4.3112	Indonesia	960.0	257	0.3	69	2.9823	2.4099
Italy	1,240.0	20,360	16.4	35	3.0934	4.3088	New Zealand	63.4	2,737	43.2	6	1.8021	3.4373
Australia	394.0	13,620	34.6	12	2.5955	4.1342	Ukraine	124.9	2,753	22.0	27	2.0966	3.4398
Netherlands	343.9	13,724	39.9	7	2.5364	4.1375	Belarus	50.4	711	14.1	39	1.7024	2.8519
Sweden	176.2	10,523	59.7	2	2.2460	4.0221	Uzbekistan	60.7	303	5.0	52	1.7832	2.4814
Denmark	122.5	5,430	44.3	5	2.0881	3.7348	Estonia	9.3	342	36.6	8	0.9703	2.5340
Finland	102.1	4,823	47.2	4	2.0090	3.6833	Latvia	10.4	217	20.9	30	1.0170	2.3365
Norway	120.5	3,295	27.3	19	2.0810	3.5179	Lithuania	15.4	293	19.0	33	1.1875	2.4669
Switzerland	172.4	9,887	57.3	3	2.2365	3.9951	Armenia	9.5	243	25.6	22	0.9777	2.3856
Belgium	236.3	6,529	27.6	18	2.3735	3.8148	Brazil	1,040.0	4,972	4.8	53	3.0170	3.6965
Austria	174.1	4,603	26.4	20	2.2408	3.6630	Argentina	348.2	2,589	7.4	47	2.5418	3.4131
Ireland	59.9	1,469	24.5	26	1.7774	3.1670	Mexico	694.3	2,503	3.6	57	2.8415	3.3985
Spain	642.4	13,677	21.3	29	2.8078	4.1360	Chile	168.5	1,150	6.8	48	2.2266	3.0607
Greece	137.4	2,713	19.7	31	2.1380	3.4334	Venezuela	185.0	577	3.1	60	2.2672	2.7612
Turkey	388.3	2,375	6.1	49	2.5892	3.3757	Colombia	231.1	342	1.5	64	2.3638	2.5340
Portugal	149.5	1,508	10.1	42	2.1746	3.1784	Cuba	16.9	223	13.2	40	1.2279	2.3483
Yugoslavia	24.3	599	24.7	24	1.3856	2.7774	Israel	96.7	6,556	67.8	1	1.9854	3.8166
Poland	280.7	5,514	19.6	32	2.4482	3.7415	Saudi Arabia	206.5	705	3.4	58	2.3149	2.8482
Czech Republic	111.9	2,753	24.6	25	2.0488	3.4398	Iran	371.2	394	1.1	65	2.5696	2.5955
Slovakia	46.3	1,328	28.7	17	1.6656	3.1232	Jordan	20.7	218	10.5	41	1.3160	2.3385
Hungary	73.2	2,441	33.3	14	1.8645	3.3876	Kuwait	46.3	213	4.6	55	1.6656	2.3284
Bulgaria	35.6	1,188	33.4	13	1.5514	3.0748	South Africa	270.0	2,306	8.5	45	2.4314	3.3629
Romania	114.2	1,065	9.3	43	2.0577	3.0273	Egypt	267.1	1,337	5.0	51	2.4267	3.1261
Croatia	22.7	698	30.7	15	1.3560	2.8439	Nigeria	132.6	450	3.4	59	2.1225	2.6532
Slovenia	19.5	677	34.7	11	1.2900	2.8306	Kenya	45.3	367	8.1	46	1.6561	2.5647
India	1,534.0	9,248	6.0	50	3.1858	3.9660	Morocco	107.0	482	4.5	56	2.0294	2.6830
China	4,250.0	10,748	2.5	61	3.6284	4.0313	Algeria	120.4	232	1.9	62	2.0806	2.3655
Taiwan	308.0	5,512	17.9	34	2.4886	3.7413	Tunisia	56.5	268	4.7	54	1.7520	2.4281
South Korea	631.2	5,411	8.6	44	2.8002	3.7333							

NOTE: Article counts and GDP converted to logarithmic form because of their highly skewed distributions.

SOURCES: **Articles–** Institute for Scientific Information, Science and Social Science Citation Indexes; CHI Research, Inc., Science Indicators database; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation; **GDP–** Purchasing power parity estimates by World Fact Book <<http://www.odci.gov/cia/publications/factbook/ni.html#econ>>

See figure 6-34 in Volume 1.

Appendix table 6-58.
Distribution of scientific and technical articles for selected countries, by field: 1986–97, selected years
(Percentages)

Field	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97
	United States				**Japan**				**United Kingdom**				**Germany**			
Total science & engineering	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Physics	9.9	10.2	10.4	10.4	16.5	17.6	19.0	21.2	8.7	9.1	10.0	10.8	15.4	16.6	18.2	19.6
Chemistry	7.4	7.5	7.6	7.8	18.6	17.8	16.4	16.0	9.3	9.3	9.3	9.6	16.8	16.3	16.4	16.2
Earth & space sciences	4.8	4.7	5.1	5.7	2.2	2.1	2.2	2.3	4.0	4.2	4.7	5.3	3.4	3.8	4.0	4.5
Mathematics	2.0	1.9	1.8	1.7	1.1	1.1	0.8	0.8	1.7	1.4	1.4	1.3	2.1	1.9	1.8	1.7
Biology	7.6	7.6	6.9	6.6	7.2	7.0	6.5	6.0	8.3	7.4	6.9	7.0	6.6	6.3	5.3	5.5
Biomedical research	15.2	15.8	16.5	17.0	15.1	15.3	15.1	14.6	14.6	15.1	15.4	15.2	14.9	15.2	14.4	14.7
Clinical medicine	31.3	30.7	30.9	31.3	27.0	28.2	29.4	29.5	36.9	37.6	36.1	33.8	28.9	28.4	28.4	27.7
Engineering	6.4	6.5	6.8	6.4	11.0	9.5	9.3	8.6	6.0	5.8	6.0	5.8	7.1	7.0	7.1	6.1
Psychology	4.1	3.8	3.5	3.5	0.5	0.5	0.5	0.5	2.3	2.1	2.1	2.2	1.9	1.7	1.6	1.5
Social sciences	4.9	4.9	4.6	4.3	0.5	0.6	0.5	0.5	4.6	4.4	4.6	4.9	2.1	1.9	2.0	1.6
Health & professional fields	6.5	6.2	5.9	5.4	0.2	0.2	0.2	0.2	3.7	3.6	3.7	4.0	1.0	1.0	0.8	0.9
	France				**Canada**				**Russia**				**Italy**			
Total science & engineering	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	NA	NA	100.0	100.0	100.0	100.0	100.0	100.0
Physics	16.9	16.3	17.4	18.2	8.0	8.3	8.9	8.5	NA	NA	31.6	35.1	15.4	15.9	17.0	18.4
Chemistry	15.7	15.5	14.9	14.1	8.4	8.2	8.6	8.9	NA	NA	26.6	25.3	15.3	14.1	13.4	12.5
Earth & space sciences	5.0	4.9	4.9	5.8	6.3	6.8	7.0	7.5	NA	NA	5.8	5.4	3.8	4.4	4.7	4.9
Mathematics	2.3	2.4	3.2	3.5	2.0	2.0	1.9	1.8	NA	NA	1.0	1.1	2.3	2.3	2.0	2.1
Biology	5.6	5.9	5.8	5.7	14.5	13.9	12.8	12.0	NA	NA	3.5	5.0	3.8	4.1	4.2	4.6
Biomedical research	16.8	17.1	16.9	16.3	13.9	14.5	14.7	14.9	NA	NA	13.7	14.1	13.4	13.7	14.1	13.6
Clinical medicine	29.4	29.4	28.1	27.5	26.4	25.9	26.0	26.7	NA	NA	9.7	4.5	39.2	38.0	36.8	35.7
Engineering	4.8	5.4	5.8	6.1	7.7	7.6	8.1	7.8	NA	NA	5.5	7.3	4.5	5.3	5.7	6.2
Psychology	1.1	1.0	0.9	1.0	4.2	4.1	3.9	3.9	NA	NA	0.6	0.7	0.8	0.7	0.6	0.7
Social sciences	1.9	1.7	1.6	1.4	4.7	4.8	4.2	4.2	NA	NA	1.4	1.1	1.1	0.9	1.0	0.8
Health & professional fields	0.6	0.5	0.5	0.5	3.9	4.1	3.9	3.7	NA	NA	0.7	0.2	0.4	0.6	0.5	0.4
	Australia				**Netherlands**				**Sweden**				**Denmark**			
Total science & engineering	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Physics	7.0	6.6	7.7	8.9	11.0	11.0	10.8	10.9	7.2	7.7	9.8	11.2	8.5	8.5	10.1	11.6
Chemistry	8.4	7.9	8.0	8.4	10.6	10.0	9.5	9.2	7.4	7.5	8.4	8.7	5.1	5.6	6.5	7.3
Earth & space sciences	6.9	6.7	7.0	6.7	4.3	4.3	4.8	5.1	3.1	3.5	3.6	4.3	2.8	3.1	4.3	5.8
Mathematics	1.9	1.6	1.6	1.6	1.7	1.6	1.4	1.3	1.1	0.9	1.0	1.1	1.4	1.4	1.2	1.4
Biology	16.9	17.8	17.1	15.5	8.5	8.3	8.2	8.2	6.7	7.0	7.6	7.1	6.1	7.0	8.4	9.8
Biomedical research	13.1	13.7	13.4	13.0	16.4	15.9	16.6	15.4	17.0	17.8	17.2	15.9	16.0	16.9	17.6	17.5
Clinical medicine	29.6	30.2	30.1	29.6	36.7	36.8	35.9	37.4	49.3	46.8	43.4	42.1	54.2	51.1	44.5	39.7
Engineering	4.6	4.3	5.0	5.6	3.8	4.5	4.8	4.4	3.9	4.0	4.3	4.9	2.2	2.7	3.1	3.2
Psychology	3.3	3.2	2.9	2.8	2.6	2.9	2.7	3.0	1.3	1.5	1.5	1.6	0.8	0.7	0.9	0.7
Social sciences	5.3	4.7	4.4	4.2	2.7	2.8	3.0	2.9	1.7	1.9	1.6	1.6	1.9	2.0	2.3	2.0
Health & professional fields	3.0	3.3	2.9	3.8	1.7	1.9	2.1	2.4	1.4	1.5	1.6	1.6	1.0	1.1	1.0	1.1

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-58.
Distribution of scientific and technical articles for selected countries, by field: 1986–97, selected years
(Percentages)

Field	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97
	Finland				**Norway**				**Switzerland**				**Belgium**			
Total science & engineering	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Physics	6.6	7.7	8.9	9.5	4.9	4.9	6.3	6.6	16.0	17.0	17.1	18.3	11.9	12.3	13.2	14.5
Chemistry	6.8	6.2	6.6	7.8	8.4	6.5	7.4	8.1	11.7	12.1	12.5	12.8	11.9	11.1	12.5	12.3
Earth & space sciences	3.2	4.0	4.1	4.6	6.4	7.8	8.3	8.6	3.0	3.1	3.7	4.3	2.9	3.0	3.3	3.8
Mathematics	1.6	1.2	1.2	1.0	1.7	1.4	1.4	1.4	1.4	1.2	1.4	1.3	2.0	1.9	1.7	1.7
Biology	7.5	8.0	8.3	9.1	11.1	11.8	11.6	12.0	4.2	4.6	4.6	4.8	5.8	6.1	5.9	7.1
Biomedical research	14.3	14.2	13.3	12.9	14.4	13.9	13.3	12.4	17.3	17.6	18.2	17.3	16.9	17.9	17.2	16.5
Clinical medicine	50.5	47.9	47.1	45.0	41.9	41.1	39.3	37.0	37.4	35.7	34.3	33.8	38.8	38.4	36.7	33.8
Engineering	4.2	5.1	5.4	5.0	3.9	4.2	4.4	5.3	4.7	4.8	4.6	4.2	4.1	4.0	4.9	5.4
Psychology	1.4	1.5	1.7	1.7	2.1	2.1	2.0	2.3	1.5	1.4	1.1	1.1	1.6	1.7	1.3	1.5
Social sciences	1.8	1.9	1.3	1.0	4.1	4.1	4.1	4.3	2.0	1.7	1.7	1.4	2.6	2.2	2.0	2.0
Health & professional fields	2.0	2.4	2.1	2.4	1.2	2.1	1.9	2.1	0.8	0.9	0.7	0.7	1.4	1.6	1.4	1.3
	Austria				**Ireland**				**Spain**				**Greece**			
Total science & engineering	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Physics	11.5	11.2	12.5	14.0	9.6	9.3	11.3	10.6	11.8	12.3	13.3	14.2	16.5	16.2	16.0	15.0
Chemistry	12.2	11.4	11.4	10.7	10.5	12.2	11.6	9.2	27.0	22.9	21.8	20.0	15.8	15.9	15.1	14.2
Earth & space sciences	2.5	3.1	2.9	3.4	4.5	4.4	3.8	4.4	3.3	4.7	4.5	5.0	7.9	8.2	8.7	7.6
Mathematics	2.4	2.4	1.9	1.6	3.3	2.5	1.9	1.9	2.5	2.3	2.2	2.4	3.8	3.3	2.8	2.4
Biology	5.3	5.5	5.8	5.0	11.6	9.9	7.5	9.6	8.1	9.6	10.9	11.4	8.6	8.6	8.5	9.0
Biomedical research	11.6	12.0	12.7	13.5	10.5	14.2	13.1	16.4	19.2	18.4	15.9	14.8	8.8	8.2	7.5	8.3
Clinical medicine	45.2	45.3	43.2	42.5	36.4	36.0	38.3	36.0	22.1	23.7	24.2	25.0	20.5	22.1	24.1	28.7
Engineering	3.9	4.7	4.6	4.9	3.8	3.6	5.3	4.4	4.1	4.1	4.8	4.7	13.7	12.9	13.1	10.7
Psychology	1.1	1.2	1.2	1.2	1.2	1.1	0.8	1.2	0.7	0.8	0.8	0.8	0.4	0.4	0.5	0.4
Social sciences	3.1	2.5	2.8	2.3	6.1	4.9	4.2	4.2	1.0	0.8	1.0	1.0	2.4	3.0	2.5	2.2
Health & professional fields	1.1	0.7	0.8	0.7	2.7	1.8	2.1	2.2	0.4	0.4	0.6	0.6	1.6	1.1	1.2	1.5
	Turkey				**Portugal**				**Yugoslavia**				**Croatia**			
Total science & engineering	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	NA	NA	100.0	100.0
Physics	11.2	8.6	9.4	9.7	19.8	19.3	17.2	16.7	19.3	17.5	19.0	21.0	NA	NA	17.0	14.6
Chemistry	18.6	17.4	16.5	17.5	18.7	16.6	18.8	18.7	21.8	19.7	23.7	20.1	NA	NA	25.6	27.4
Earth & space sciences	7.2	7.7	6.2	5.9	4.0	5.0	3.7	4.5	4.1	4.7	4.6	3.6	NA	NA	5.8	5.4
Mathematics	2.5	1.4	1.0	0.8	3.2	3.3	2.8	2.6	2.7	2.0	2.3	1.8	NA	NA	2.0	2.2
Biology	5.4	5.6	4.7	4.7	6.4	8.0	9.8	10.8	3.3	3.8	4.6	5.7	NA	NA	4.8	4.3
Biomedical research	5.7	5.5	6.0	7.2	11.9	14.2	14.0	14.1	14.7	15.3	9.2	7.5	NA	NA	8.6	6.6
Clinical medicine	30.3	35.9	41.0	41.0	19.4	18.2	17.2	17.2	22.5	24.4	21.6	21.1	NA	NA	23.0	23.6
Engineering	14.5	13.1	11.6	10.1	11.6	11.3	12.3	11.6	8.4	8.9	12.7	17.9	NA	NA	5.4	4.0
Psychology	0.9	0.9	0.8	0.4	0.9	0.8	0.6	0.9	0.8	0.9	0.4	0.3	NA	NA	0.6	1.6
Social sciences	2.2	2.4	1.6	1.7	2.1	1.2	1.8	1.7	1.3	1.9	1.3	0.4	NA	NA	6.1	9.6
Health & professional fields	1.5	1.6	1.3	1.0	2.0	2.1	1.7	1.3	1.0	0.9	0.6	0.7	NA	NA	1.2	0.6

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-58.
Distribution of scientific and technical articles for selected countries, by field: 1986–97, selected years
(Percentages)

Field	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97
	Slovenia				**Poland**				**Hungary**				**Bulgaria**			
Total science & engineering	NA	NA	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Physics	NA	NA	21.6	22.8	26.6	27.6	28.7	31.0	10.7	12.5	14.9	16.9	15.8	17.2	20.0	23.7
Chemistry	NA	NA	21.7	23.1	29.8	27.8	29.1	29.6	27.3	28.6	27.6	30.7	19.3	21.7	26.2	29.1
Earth & space sciences	NA	NA	3.3	3.8	1.9	2.6	3.1	3.4	2.2	2.5	3.0	3.6	2.4	2.6	3.1	3.8
Mathematics	NA	NA	2.6	3.2	3.4	3.5	2.8	2.5	4.7	3.9	3.8	2.6	2.2	2.7	2.6	3.0
Biology	NA	NA	4.2	5.0	5.6	5.8	5.6	4.9	4.1	4.7	5.3	4.9	2.0	3.1	4.5	7.0
Biomedical research	NA	NA	13.8	12.1	9.9	10.7	9.4	8.3	20.5	19.3	16.1	13.4	44.2	36.2	25.7	11.3
Clinical medicine	NA	NA	17.1	15.9	12.9	12.2	11.1	11.9	23.0	19.8	20.3	19.8	7.9	8.8	7.9	10.7
Engineering	NA	NA	11.3	10.9	7.7	7.6	8.1	7.0	3.0	4.4	4.1	4.5	5.6	6.0	8.2	9.6
Psychology	NA	NA	1.0	0.4	0.4	0.5	0.4	0.3	0.5	0.6	0.7	0.7	0.3	0.5	0.1	0.3
Social sciences	NA	NA	2.0	1.6	0.9	1.2	1.2	0.8	2.7	2.4	3.0	1.9	0.3	0.6	1.0	0.8
Health & professional fields	NA	NA	1.4	1.2	0.8	0.5	0.5	0.4	1.2	1.3	1.1	1.1	0.2	0.6	0.8	0.7
	Romania				**Czechoslovakia**				**Czech Republic**				**Slovakia**			
Total science & engineering	100.0	100.0	100.0	100.0	100.0	100.0	100.0	NA	NA	NA	100.0	100.0	NA	NA	100.0	100.0
Physics	20.2	21.9	26.0	31.8	11.4	13.6	14.1	NA	NA	NA	16.3	16.7	NA	NA	18.4	14.6
Chemistry	37.9	42.1	42.3	37.3	31.2	31.2	28.3	NA	NA	NA	29.3	29.8	NA	NA	27.2	30.3
Earth & space sciences	1.3	1.3	2.6	1.7	4.1	3.6	4.3	NA	NA	NA	3.8	4.9	NA	NA	4.5	3.4
Mathematics	7.6	7.4	5.8	5.6	1.2	1.7	2.0	NA	NA	NA	2.3	1.7	NA	NA	1.0	1.9
Biology	1.2	1.0	1.2	1.1	4.9	5.0	6.3	NA	NA	NA	7.4	7.0	NA	NA	3.0	3.9
Biomedical research	6.9	5.9	3.9	3.8	13.7	14.8	16.0	NA	NA	NA	14.7	15.1	NA	NA	16.7	15.7
Clinical medicine	8.6	7.0	4.4	3.9	18.0	16.5	15.2	NA	NA	NA	11.5	11.6	NA	NA	14.8	14.9
Engineering	14.9	11.8	12.5	13.6	4.3	4.7	6.5	NA	NA	NA	6.0	6.4	NA	NA	3.8	5.2
Psychology	0.4	0.4	0.1	0.1	3.3	1.9	2.3	NA	NA	NA	2.2	2.4	NA	NA	4.3	4.8
Social sciences	0.9	0.8	0.6	0.7	7.6	6.7	4.8	NA	NA	NA	6.2	4.1	NA	NA	6.1	5.3
Health & professional fields	0.2	0.3	0.7	0.3	0.2	0.3	0.3	NA	NA	NA	0.2	0.3	NA	NA	0.1	0.1
	India				**China**				**Taiwan**				**South Korea**			
Total science & engineering	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Physics	16.2	17.1	18.4	20.2	33.3	34.9	36.2	34.6	15.6	16.2	17.2	17.7	16.7	20.5	23.0	26.6
Chemistry	25.7	27.2	26.6	27.3	15.0	15.8	19.1	24.2	14.7	17.4	16.9	16.3	35.3	30.3	28.1	25.1
Earth & space sciences	5.7	5.3	5.4	4.9	6.0	4.1	3.5	4.1	1.3	1.6	2.2	4.0	2.4	1.7	2.2	2.3
Mathematics	1.4	1.3	1.1	1.1	3.9	4.3	4.6	3.9	2.6	1.9	1.5	1.8	2.2	2.1	1.6	1.7
Biology	9.5	9.1	8.2	7.0	3.6	3.5	3.4	3.9	8.5	7.4	6.2	5.5	3.8	2.8	2.7	3.0
Biomedical research	15.1	12.6	12.0	13.6	8.2	7.0	6.5	5.3	8.0	8.0	8.5	9.1	5.4	6.9	7.8	8.1
Clinical medicine	12.6	13.3	13.1	12.3	15.6	14.0	10.6	8.5	19.0	18.2	20.8	22.5	9.0	10.1	11.5	12.8
Engineering	10.8	10.3	11.7	11.1	12.1	14.4	15.0	14.4	24.9	24.9	23.9	20.4	21.2	22.3	20.2	18.2
Psychology	0.4	0.4	0.4	0.2	0.1	0.3	0.1	0.1	0.3	0.6	0.3	0.3	0.3	0.2	0.3	0.2
Social sciences	2.1	2.6	2.6	1.8	1.6	0.9	0.5	0.5	4.6	3.3	1.8	1.4	2.4	1.5	1.4	1.0
Health & professional fields	0.6	0.7	0.6	0.5	0.7	0.7	0.4	0.4	0.4	0.6	0.7	0.9	1.3	1.5	1.1	1.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-58.
Distribution of scientific and technical articles for selected countries, by field: 1986–97, selected years
(Percentages)

Field	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97
	Hong Kong				**Singapore**				**Thailand**				**Malaysia**			
Total science & engineering	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Physics	6.6	5.4	10.3	14.7	9.8	7.5	13.4	16.1	3.2	2.3	2.9	4.1	4.1	6.6	5.6	4.9
Chemistry	9.5	9.4	10.9	12.5	11.0	14.7	13.4	12.2	4.9	5.7	5.3	7.4	14.7	13.8	22.7	30.2
Earth & space sciences	1.3	1.9	2.4	3.0	4.2	3.1	2.3	2.5	4.6	4.5	3.6	4.3	4.0	3.6	4.3	4.6
Mathematics	2.2	2.6	2.2	2.7	3.2	2.9	3.3	4.2	0.6	0.1	0.1	0.1	1.5	1.6	1.4	0.6
Biology	2.7	3.1	2.2	4.5	6.7	6.4	5.0	4.1	11.6	14.7	15.8	16.6	21.3	18.8	19.9	17.4
Biomedical research	9.2	8.4	7.1	6.2	8.5	10.6	10.8	10.2	19.7	14.8	17.5	12.3	10.6	11.7	10.9	9.2
Clinical medicine	44.3	48.2	41.3	31.0	29.1	24.8	22.6	18.4	38.9	43.3	42.1	43.4	29.5	28.7	25.1	21.2
Engineering	7.4	9.2	11.9	12.0	15.8	19.6	20.6	25.3	6.4	5.7	5.8	7.6	3.8	5.9	4.4	6.1
Psychology	4.1	4.2	2.7	3.0	1.4	1.2	1.1	0.5	0.4	0.6	0.1	0.5	0.8	0.5	0.4	0.6
Social sciences	6.5	3.8	4.4	5.0	6.6	5.5	4.3	3.6	6.5	5.3	4.0	2.3	6.0	5.5	2.8	3.3
Health & professional fields	6.2	3.8	4.4	5.6	3.8	3.9	3.2	3.0	3.2	3.0	2.8	1.5	3.8	3.3	2.6	2.0
	Pakistan				**Philippines**				**Bangladesh**				**New Zealand**			
Total science & engineering	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Physics	15.9	20.0	18.0	14.2	0.9	2.2	4.2	4.7	12.8	10.9	11.7	10.6	4.1	3.7	4.6	4.8
Chemistry	21.8	18.1	20.7	21.3	3.6	2.7	2.6	1.1	11.0	12.3	14.3	16.2	6.4	7.6	6.8	7.5
Earth & space sciences	4.1	2.8	3.6	2.9	3.0	3.6	3.2	5.7	2.5	2.4	2.2	2.7	6.5	8.1	7.5	7.7
Mathematics	1.1	1.3	1.5	1.0	0.9	0.6	0.9	0.8	0.7	0.5	0.3	0.8	1.5	1.4	1.5	1.4
Biology	27.0	25.6	21.7	15.7	57.5	53.8	56.8	54.8	12.5	12.4	12.4	12.8	25.6	23.9	23.2	24.4
Biomedical research	5.7	6.7	5.2	6.8	8.0	9.1	8.8	9.9	11.3	10.8	12.7	9.9	10.7	10.4	11.0	9.9
Clinical medicine	9.3	14.5	15.7	24.6	10.7	14.0	11.0	11.7	25.2	29.5	23.1	23.3	31.4	30.9	30.4	29.1
Engineering	10.1	5.0	8.3	7.1	2.5	0.5	1.7	1.6	5.6	5.8	8.0	9.6	3.5	3.5	3.5	3.6
Psychology	0.2	0.7	0.5	0.5	1.4	1.2	0.7	0.8	0.9	0.7	0.9	0.3	4.0	2.9	3.7	4.0
Social sciences	3.3	3.8	3.2	4.0	9.2	9.4	8.2	6.4	14.8	13.5	12.1	11.9	3.3	3.9	4.0	3.7
Health & professional fields	1.5	1.5	1.5	2.0	2.3	3.0	1.9	2.5	2.7	1.3	2.2	1.9	3.0	3.5	3.8	4.0
	Former USSR				**Ukraine**				**Belarus**				**Uzbekistan**			
Total science & engineering	100.0	100.0	100.0	100.0	NA	NA	100.0	100.0	NA	NA	100.0	100.0	NA	NA	100.0	100.0
Physics	27.2	29.0	33.0	36.8	NA	NA	43.4	46.4	NA	NA	45.0	47.4	NA	NA	38.9	31.8
Chemistry	26.6	26.0	26.6	25.5	NA	NA	24.9	22.7	NA	NA	28.4	26.1	NA	NA	37.3	56.2
Earth & space sciences	4.6	4.5	5.7	5.1	NA	NA	4.1	4.3	NA	NA	1.9	1.2	NA	NA	3.8	2.2
Mathematics	1.1	1.1	1.1	1.1	NA	NA	1.0	1.3	NA	NA	1.5	1.6	NA	NA	0.6	0.7
Biology	2.6	2.6	3.1	4.6	NA	NA	2.0	2.3	NA	NA	2.7	2.7	NA	NA	1.7	1.6
Biomedical research	18.1	16.8	13.6	12.6	NA	NA	6.2	5.0	NA	NA	7.7	9.8	NA	NA	5.6	4.0
Clinical medicine	13.9	13.3	8.9	4.5	NA	NA	6.9	3.6	NA	NA	5.7	3.3	NA	NA	8.7	1.8
Engineering	4.5	4.8	5.8	7.9	NA	NA	10.3	13.9	NA	NA	5.8	6.8	NA	NA	2.5	1.7
Psychology	0.6	0.6	0.5	0.6	NA	NA	0.2	0.3	NA	NA	0.2	0.2	NA	NA	0.0	0.0
Social sciences	0.6	0.8	1.1	1.0	NA	NA	0.4	0.3	NA	NA	0.8	0.6	NA	NA	0.7	0.0
Health & professional fields	0.2	0.5	0.6	0.2	NA	NA	0.5	0.1	NA	NA	0.2	0.4	NA	NA	0.2	0.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-58.
Distribution of scientific and technical articles for selected countries, by field: 1986–97, selected years
(Percentages)

Field	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97
	Estonia				**Latvia**				**Lithuania**				**Armenia**			
Total science & engineering	NA	NA	100.0	100.0	NA	NA	100.0	100.0	NA	NA	100.0	100.0	NA	NA	100.0	100.0
Physics	NA	NA	29.8	29.5	NA	NA	33.1	33.0	NA	NA	42.9	42.1	NA	NA	48.9	51.1
Chemistry	NA	NA	14.3	14.5	NA	NA	35.6	32.9	NA	NA	20.8	22.0	NA	NA	15.7	16.7
Earth & space sciences	NA	NA	14.0	10.1	NA	NA	4.2	4.7	NA	NA	2.0	2.5	NA	NA	6.0	6.0
Mathematics	NA	NA	0.3	0.8	NA	NA	0.5	1.3	NA	NA	2.4	1.1	NA	NA	3.6	1.7
Biology	NA	NA	7.9	12.2	NA	NA	1.9	3.4	NA	NA	1.9	3.6	NA	NA	3.3	2.7
Biomedical research	NA	NA	11.8	9.5	NA	NA	7.8	11.4	NA	NA	11.6	12.2	NA	NA	10.8	12.4
Clinical medicine	NA	NA	13.5	17.7	NA	NA	9.2	6.2	NA	NA	8.9	6.4	NA	NA	8.7	4.7
Engineering	NA	NA	4.5	2.6	NA	NA	4.8	6.0	NA	NA	9.2	8.8	NA	NA	1.9	4.3
Psychology	NA	NA	0.9	1.0	NA	NA	0.3	0.8	NA	NA	0.0	0.1	NA	NA	0.1	0.4
Social sciences	NA	NA	2.9	1.4	NA	NA	1.5	0.1	NA	NA	0.3	0.8	NA	NA	0.9	0.0
Health & professional fields	NA	NA	0.1	0.6	NA	NA	0.9	0.3	NA	NA	0.0	0.5	NA	NA	0.0	0.1
	Brazil				**Argentina**				**Mexico**				**Chile**			
Total science & engineering	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Physics	19.6	20.1	22.0	22.9	16.8	17.8	18.1	18.4	15.2	16.6	18.7	21.0	5.6	5.5	7.4	8.1
Chemistry	11.2	7.9	9.8	11.6	16.5	15.8	15.7	13.8	10.1	8.8	9.7	11.8	10.8	11.1	12.4	12.0
Earth & space sciences	6.9	6.6	5.5	4.9	4.4	5.1	5.1	4.9	8.1	7.4	7.2	7.6	8.6	8.6	9.3	8.6
Mathematics	3.3	2.7	2.5	2.3	1.1	1.1	1.3	1.2	2.7	2.4	1.6	1.4	2.0	2.2	2.2	2.5
Biology	8.9	8.1	9.4	9.8	10.4	12.2	13.0	15.5	13.3	14.7	17.2	14.8	10.0	10.4	10.0	11.2
Biomedical research	16.2	20.1	17.5	17.1	17.0	15.4	14.6	15.3	14.7	13.7	14.3	14.3	16.0	14.2	12.8	13.0
Clinical medicine	20.6	23.4	23.1	21.7	26.5	24.9	24.1	23.6	27.3	26.8	21.4	20.2	40.0	42.2	39.7	37.5
Engineering	4.4	4.7	5.0	5.3	4.7	4.7	4.8	4.9	4.0	4.6	5.0	4.4	3.4	2.7	2.6	3.6
Psychology	3.0	1.8	0.9	0.6	0.7	1.1	0.9	0.7	1.1	1.8	1.6	1.3	0.7	0.7	0.6	0.5
Social sciences	2.3	1.5	1.7	1.4	1.7	1.5	1.8	1.3	2.9	2.2	2.1	2.0	1.9	1.3	1.7	1.6
Health & professional fields	3.3	2.9	2.6	2.4	0.2	0.4	0.7	0.4	0.8	1.1	1.3	1.0	0.9	1.1	1.4	1.2
	Venezuela				**Colombia**				**Cuba**				**Israel**			
Total science & engineering	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Physics	17.6	15.9	16.7	14.1	1.9	6.4	12.5	15.9	20.3	13.6	15.7	15.8	12.3	12.7	15.2	17.6
Chemistry	15.8	14.2	15.5	19.4	2.6	3.6	3.5	7.3	17.5	19.5	14.9	19.6	6.6	6.6	6.5	7.0
Earth & space sciences	5.3	4.7	5.9	4.8	4.5	4.1	2.6	5.3	2.0	3.9	1.8	1.6	3.4	3.2	3.8	3.5
Mathematics	2.6	3.3	3.6	3.4	1.0	0.4	2.1	1.4	0.5	0.1	0.7	1.2	3.2	2.9	3.1	3.2
Biology	10.7	13.1	14.2	13.3	33.8	33.2	32.7	23.5	11.7	15.7	10.9	10.6	9.0	9.6	8.9	7.9
Biomedical research	18.1	15.7	14.5	14.7	10.2	11.9	9.5	13.2	17.5	13.5	24.8	15.5	13.6	13.5	14.1	12.9
Clinical medicine	21.3	21.0	22.0	19.2	31.4	27.8	25.1	22.4	23.8	22.6	22.6	26.3	34.3	34.2	33.3	32.0
Engineering	4.7	6.4	4.6	5.9	3.8	2.2	2.1	3.9	3.7	3.5	2.9	6.7	6.2	6.0	6.1	6.7
Psychology	1.1	1.4	0.7	2.3	2.7	4.2	4.7	2.6	0.3	1.6	0.7	0.7	3.1	3.0	2.9	2.7
Social sciences	2.1	2.1	1.1	1.1	3.8	5.1	3.4	2.5	2.5	4.3	4.1	1.3	4.7	4.7	3.7	3.6
Health & professional fields	0.6	2.2	1.2	1.8	4.4	1.2	1.8	2.0	0.3	1.7	0.7	0.6	3.6	3.6	2.6	3.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-58.
Distribution of scientific and technical articles for selected countries, by field: 1986–97, selected years
(Percentages)

Field	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97	Articles published in: 1986–88	1989–91	1992–94	1995–97
	Saudi Arabia				**Iran**				**Jordan**				**Kuwait**			
Total science & engineering	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Physics	6.5	5.9	7.6	8.3	7.5	11.0	12.2	14.0	12.3	9.6	15.0	15.9	4.4	5.0	4.6	6.3
Chemistry	12.4	11.4	9.5	10.1	16.0	22.7	25.9	33.0	23.2	23.7	10.6	18.1	11.8	9.6	7.3	15.2
Earth & space sciences	3.9	5.5	4.5	4.2	5.4	5.8	5.0	3.3	3.6	4.6	5.1	6.0	5.9	6.4	8.1	7.9
Mathematics	2.6	2.0	1.8	2.0	7.8	3.8	3.5	2.1	2.9	0.9	2.4	1.6	3.4	3.5	1.5	2.5
Biology	6.6	6.2	7.1	5.5	15.6	10.9	7.1	6.1	8.3	7.7	8.8	8.5	4.2	6.4	5.4	5.5
Biomedical research	7.6	5.9	5.2	7.3	8.3	4.4	4.5	4.2	4.1	7.0	7.7	5.9	16.0	13.4	8.5	9.1
Clinical medicine	40.1	43.1	42.1	42.8	21.9	25.7	25.8	26.7	23.2	25.9	26.4	25.5	34.1	33.0	29.7	25.5
Engineering	16.4	15.9	18.5	15.7	12.1	10.0	11.7	9.2	13.9	14.4	14.4	14.4	15.8	17.9	27.7	21.3
Psychology	0.4	0.3	0.2	0.1	0.4	1.8	1.1	0.4	0.5	0.4	2.2	0.2	0.9	1.0	2.0	2.5
Social sciences	0.9	1.2	0.3	0.7	4.0	1.7	1.1	0.5	4.1	3.6	4.9	2.6	1.2	1.9	2.7	2.6
Health & professional fields	2.5	2.7	3.1	3.3	1.1	2.2	2.0	0.5	3.9	2.2	2.5	1.3	2.4	1.9	2.5	1.6
	South Africa				**Egypt**				**Nigeria**				**Kenya**			
Total science & engineering	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Physics	5.4	5.9	7.7	6.2	9.1	10.5	12.0	13.3	2.2	1.5	2.2	2.6	1.0	1.0	0.6	0.8
Chemistry	9.7	10.3	10.2	10.0	39.6	41.6	39.6	36.8	6.5	7.6	7.6	8.9	0.9	0.5	1.0	0.9
Earth & space sciences	7.4	7.7	8.6	10.2	4.1	4.4	4.6	4.4	3.9	3.8	4.8	4.1	1.6	3.0	3.4	2.7
Mathematics	1.6	1.3	1.2	1.3	0.9	0.7	1.1	0.8	1.4	0.5	0.5	1.2	0.1	0.7	0.3	0.1
Biology	15.9	17.5	18.0	18.1	11.9	10.3	8.4	8.3	24.2	24.5	24.6	27.4	20.0	19.8	22.4	25.3
Biomedical research	13.1	13.8	13.3	13.4	5.8	5.4	5.7	5.5	8.9	9.2	7.7	11.3	14.6	13.8	11.5	11.6
Clinical medicine	36.2	33.2	28.1	27.3	14.5	14.4	14.9	17.3	31.6	34.1	35.3	32.1	51.8	52.0	53.7	51.5
Engineering	5.1	4.0	5.0	4.3	12.6	11.7	12.5	12.6	4.3	4.4	3.2	2.6	0.4	1.1	0.9	0.9
Psychology	1.1	1.3	1.9	1.9	0.2	0.1	0.1	0.1	1.3	0.8	1.2	0.4	1.6	0.8	0.8	0.7
Social sciences	3.0	3.2	4.2	4.9	0.9	0.6	0.7	0.7	6.5	7.5	6.8	3.6	4.5	4.5	3.9	3.9
Health & professional fields	1.4	1.9	1.9	2.6	0.2	0.3	0.5	0.3	9.1	6.1	6.2	5.6	3.5	2.7	1.5	1.4
	Morocco				**Algeria**				**Tunisia**				**World**			
Total science & engineering	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Physics	11.4	10.5	20.2	21.2	21.8	27.0	27.8	34.4	15.4	8.0	8.5	13.0	12.5	13.1	14.1	15.1
Chemistry	23.7	28.8	28.8	29.2	18.7	24.9	21.3	24.1	22.1	34.2	26.1	26.2	12.3	12.2	12.2	12.5
Earth & space sciences	8.8	4.3	6.0	5.6	5.2	2.2	4.9	4.4	7.7	4.3	2.9	4.0	4.3	4.4	4.7	5.1
Mathematics	3.5	4.8	5.2	7.3	4.1	2.9	4.9	3.4	7.6	5.2	5.1	6.2	1.9	1.8	1.7	1.7
Biology	16.8	20.9	11.1	8.1	10.9	7.6	6.0	5.8	6.1	6.6	7.6	7.4	7.7	7.6	7.2	7.2
Biomedical research	6.3	5.2	6.2	6.0	7.8	4.8	5.5	5.6	4.6	6.3	8.1	7.9	15.0	15.2	15.0	14.9
Clinical medicine	15.0	14.4	11.1	14.2	17.0	12.5	11.0	6.3	31.7	31.4	36.6	28.0	30.0	29.6	29.2	28.7
Engineering	8.2	7.7	9.8	7.7	8.3	12.9	17.6	14.4	2.6	2.3	3.7	5.8	6.5	6.5	7.0	6.9
Psychology	0.2	0.9	0.0	0.1	1.4	0.3	0.0	0.0	0.0	0.0	0.0	0.2	2.8	2.6	2.4	2.2
Social sciences	4.0	0.9	1.1	0.4	4.1	3.0	0.7	1.0	1.0	1.4	0.6	0.4	3.5	3.4	3.2	2.9
Health & professional fields	2.0	1.7	0.5	0.3	0.7	2.0	0.4	0.5	1.2	0.3	0.7	0.8	3.6	3.5	3.2	2.9

NA = not applicable

SOURCES: Institute for Scientific Information, Science Citation Index and Social Science Citation Index; CHI Research, Inc., Science Indicators database; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See figure 6-35 in Volume 1.

Appendix table 6-59.
Changes in the field composition of scientific and technical articles for selected countries: 1986–88 to 1995–97
(Percentage points)

Country	Fields										
	Physics	Chemistry	Earth & space	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering/ Technology	Psychology	Social sciences	Health & professional
United States											
Japan	5	(3)					3	(2)			
United Kingdom	2						(3)				
Germany	4										
France											
Canada					(2)						
Russia	4						(5)				
Italy	3	(3)					(4)				
Australia											
Netherlands											
Sweden	4						(7)				
Denmark	3	2	3		4		(15)				
Finland	3						(6)				
Norway			2				(5)				
Switzerland	2						(4)				
Belgium	3						(5)				
Austria	3						(3)				
Ireland						6					
Spain	2	(7)			3	(4)	3				
Greece							8	(3)			
Turkey							11	(4)			
Portugal	(3)				4	2	(2)				
Yugoslavia					2	(7)		10			
Croatia	(2)									4	
Slovenia											
Poland	4										
Hungary	6	3		(2)		(7)	(3)				
Bulgaria	8	10			5	(33)	3	4			
Romania	12					(3)	(5)				
Former Czechoslovakia	3	(3)				2	(3)	2		(3)	
Czech Republic										(2)	
Slovakia	(4)	3									
India	4	(3)									
China		9				(3)	(7)	2			
Taiwan	2		3		(3)		4	(4)		(3)	
South Korea	10	(10)				3	4	(3)			
Hong Kong	8	3				(3)	(13)	5			

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-59.
Changes in the field composition of scientific and technical articles for selected countries: 1986–88 to 1995–97
(Percentage points)

Country	Fields										
	Physics	Chemistry	Earth & space	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering/ Technology	Psychology	Social sciences	Health & professional
Singapore	6				(3)		(11)	10		(3)	
Thailand		3			5	(7)	5			(4)	
Malaysia		15			(4)		(8)	2		(3)	
Pakistan					(11)		15	(3)			
Philippines	4	(2)	3		(3)					(3)	
Bangladesh	(2)	5						4		(3)	
New Zealand							(2)				
Former USSR	10				2	(6)	(9)	3			
Ukraine	3	(2)					(3)	4			
Belarus	2	(2)				2	(2)				
Uzbekistan	(7)	19					(7)				
Estonia			(4)		4	(2)	4				
Latvia		(3)				4	(3)				
Lithuania							(2)				
Armenia	2						(4)	2			
Brazil	3								(2)		
Argentina		(3)			5		(3)				
Mexico	6							(7)			
Chile	3					(3)	(3)				
Venezuela	(3)	4			3	(3)	(2)				
Colombia	14	5			(10)	3	(9)				(2)
Cuba	(4)	2					3	3			
Israel	5						(2)				
Saudi Arabia		(2)					3				
Iran	7	17	(2)	(6)	(9)	(4)	5	(3)		(4)	
Jordan	4	(5)	2				2				(3)
Kuwait		3	2			(7)	(9)	5			
South Africa			3		2		(9)				
Egypt	4	(3)			(4)		3				
Nigeria		2			3	2				(3)	(4)
Kenya					5	(3)					(2)
Morocco	10	5	(3)	4	(9)					(4)	
Algeria	13	5			(5)	(2)	(11)	6		(3)	
Tunisia	(2)	4	(4)			3	(4)	3			

NOTE: Small changes—shifts in shares of total articles of less than plus or minus 2 percentage points—have been suppressed in this table.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Science Citation Index; CHI Research, Inc., Science Indicators database; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See page 6-48 in Volume 1.

Appendix table 6-60.
Coauthored and internationally coauthored scientific and technical articles for selected countries, by field: 1986–97
(Percentages)

Field	Percent coauthored				Percent internationally coauthored				Percent coauthored				Percent internationally coauthored			
	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97
	United States								**Japan**							
Total science & engineering	46.4	49.4	52.9	56.8	9.8	11.8	14.9	18.0	39.5	44.5	49.3	54.0	8.1	10.1	12.7	15.2
Physics	43.5	47.9	54.3	59.3	16.1	19.1	24.7	30.1	36.3	40.6	47.4	52.0	8.4	10.4	14.6	17.8
Chemistry	31.2	34.5	38.6	42.6	10.0	11.6	14.5	16.9	28.8	32.6	36.6	41.0	4.8	6.0	8.1	9.9
Earth & space sciences	48.8	53.3	58.2	63.1	16.7	20.2	24.2	28.7	51.7	56.5	61.9	67.5	21.0	27.0	31.0	37.0
Mathematics	40.0	42.8	46.8	49.6	19.7	21.0	24.3	26.8	23.6	30.3	34.0	34.9	14.3	16.7	18.0	17.7
Biology	37.9	42.5	46.0	50.1	8.7	11.1	13.1	15.9	35.2	42.1	46.5	49.9	8.5	10.2	11.9	14.3
Biomedical research	51.1	54.7	58.8	61.8	11.8	14.0	17.0	19.5	45.7	52.5	57.6	63.1	10.5	13.0	15.6	18.8
Clinical medicine	59.6	61.4	63.3	66.4	7.8	9.5	12.2	15.0	47.8	52.1	55.7	60.6	7.9	9.2	11.2	12.5
Engineering	35.5	39.3	43.3	47.0	9.8	11.5	13.8	16.5	36.1	39.4	43.2	46.3	6.3	8.6	10.9	13.3
Psychology	36.5	38.5	41.3	43.6	4.3	5.7	6.9	8.9	30.4	36.3	40.7	42.9	11.4	13.5	15.8	17.2
Social sciences	29.6	30.8	32.9	35.8	6.4	7.0	8.8	10.3	28.3	32.6	32.6	38.1	16.1	19.8	20.2	19.9
Health & professional fields	32.9	34.9	36.1	39.6	3.3	3.8	4.6	6.5	36.8	38.4	40.8	55.1	22.1	23.9	27.0	33.4
	United Kingdom								**Germany**							
Total science & engineering	39.4	44.4	49.4	53.9	16.7	20.0	24.3	29.3	39.3	44.2	49.0	54.9	20.7	25.0	29.1	33.7
Physics	39.6	46.8	53.7	59.0	26.8	32.1	38.7	44.7	43.9	48.4	55.2	61.0	32.3	36.5	42.3	48.0
Chemistry	35.4	40.5	46.9	50.4	18.5	21.6	25.4	28.2	31.2	36.9	39.9	43.9	16.5	21.3	22.6	25.7
Earth & space sciences	46.5	54.6	58.7	63.4	32.4	39.5	42.9	47.3	50.0	54.5	60.5	67.5	39.9	43.5	48.7	54.8
Mathematics	33.7	40.3	43.7	47.4	26.6	33.3	34.9	36.9	32.2	38.3	40.8	46.2	26.9	33.3	35.3	38.6
Biology	29.3	36.2	43.7	50.8	15.2	19.4	24.4	29.9	31.4	35.9	41.5	46.7	17.3	21.6	25.7	29.0
Biomedical research	41.0	47.0	52.1	58.1	20.6	24.4	28.7	34.2	43.5	48.1	54.3	58.6	26.2	29.7	35.3	37.5
Clinical medicine	47.1	50.2	54.5	58.2	12.0	14.3	17.9	22.8	45.7	50.1	53.1	59.3	14.2	18.0	20.5	24.5
Engineering	30.1	33.2	37.4	41.8	15.5	17.5	20.0	24.0	31.2	35.9	38.2	45.3	14.5	18.5	21.5	27.2
Psychology	28.9	36.3	41.5	45.7	12.4	15.2	17.8	21.6	19.5	23.3	29.5	37.1	8.3	12.6	14.7	19.2
Social sciences	23.8	25.3	30.1	31.5	11.1	11.2	15.4	15.9	14.0	17.1	19.7	22.7	8.9	10.6	12.0	14.5
Health & professional fields	23.0	25.6	26.8	32.5	7.3	8.3	9.5	12.5	15.9	19.3	27.1	26.5	9.3	9.5	16.0	12.7
	France								**Canada**							
Total science & engineering	51.8	56.4	60.6	64.8	22.2	26.7	31.4	35.6	46.0	50.6	55.0	59.0	19.7	23.1	27.2	31.2
Physics	52.7	59.0	64.7	70.1	31.3	37.8	44.1	49.9	43.2	53.2	57.9	61.6	28.6	36.3	41.3	46.3
Chemistry	43.0	48.1	52.6	56.1	18.4	24.0	28.4	31.0	33.5	36.1	40.0	41.2	18.7	21.3	25.0	26.8
Earth & space sciences	61.3	67.3	72.3	75.8	35.3	42.7	50.4	53.9	48.6	55.1	59.0	62.7	27.0	31.8	35.6	39.9
Mathematics	39.9	44.8	45.1	45.2	31.6	32.7	29.3	28.3	49.1	51.1	56.3	57.6	41.1	42.7	47.9	48.0
Biology	44.7	50.2	55.0	59.4	19.0	23.1	27.3	31.4	34.9	41.3	45.4	52.2	12.9	16.3	18.5	22.5
Biomedical research	53.9	58.2	61.8	66.1	24.0	28.5	32.3	36.4	49.9	55.2	60.5	64.8	22.1	24.5	29.7	34.3
Clinical medicine	60.2	62.8	66.1	69.0	16.0	19.1	22.1	25.4	62.3	64.9	68.8	72.0	17.7	20.7	25.8	30.2
Engineering	40.5	45.8	52.6	55.6	18.5	22.1	27.8	30.1	37.7	42.7	45.3	49.2	19.6	22.4	24.5	27.0
Psychology	27.9	37.2	41.7	46.9	13.8	18.3	22.8	23.6	34.2	37.4	40.7	42.1	14.8	16.7	17.5	22.1
Social sciences	26.1	29.0	33.9	44.9	13.2	16.8	20.3	28.0	29.6	30.9	34.0	37.0	16.4	17.1	19.8	21.0
Health & professional fields	33.2	35.4	42.8	50.8	23.7	22.6	30.0	34.7	35.6	38.8	42.3	50.1	15.5	16.6	18.5	23.4

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-60.
Coauthored and internationally coauthored scientific and technical articles for selected countries, by field: 1986–97
(Percentages)

Field	Percent coauthored				Percent internationally coauthored				Percent coauthored				Percent internationally coauthored			
	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97
	Russia								Italy							
Total science & engineering	NA	NA	31.0	38.5	NA	NA	19.3	26.1	61.4	65.6	68.6	71.6	24.0	27.5	32.2	35.3
Physics	NA	NA	34.9	44.4	NA	NA	27.6	35.4	70.5	73.1	76.8	80.3	39.0	42.1	50.1	52.5
Chemistry	NA	NA	23.1	30.4	NA	NA	11.1	15.1	57.0	61.9	62.5	65.3	20.1	23.0	27.1	29.7
Earth & space sciences	NA	NA	39.6	49.9	NA	NA	30.0	40.0	65.4	73.9	76.3	78.5	38.6	43.9	48.8	52.0
Mathematics	NA	NA	31.7	47.4	NA	NA	27.4	44.5	49.3	53.7	57.2	54.5	33.1	34.4	40.0	38.4
Biology	NA	NA	24.0	26.6	NA	NA	13.2	15.2	50.6	52.2	57.2	61.0	20.3	23.3	28.0	30.4
Biomedical research	NA	NA	35.9	40.0	NA	NA	18.9	21.9	64.0	69.5	71.5	73.8	26.5	31.6	32.4	36.2
Clinical medicine	NA	NA	32.7	41.0	NA	NA	11.2	22.7	62.7	65.8	69.8	72.7	16.8	19.2	22.8	25.5
Engineering	NA	NA	28.6	31.3	NA	NA	16.0	19.5	47.8	54.4	53.3	56.0	19.9	24.9	26.3	28.5
Psychology	NA	NA	22.6	25.1	NA	NA	10.3	13.4	38.7	54.5	61.4	62.9	19.4	24.7	37.3	35.2
Social sciences	NA	NA	17.3	20.1	NA	NA	8.5	10.6	34.0	40.5	43.4	49.1	23.7	24.4	28.2	33.3
Health & professional fields	NA	NA	14.7	30.3	NA	NA	3.7	17.4	33.3	34.3	43.3	51.9	17.9	16.1	23.8	30.0
	Australia								Netherlands							
Total science & engineering	39.3	44.0	49.1	54.3	16.4	19.8	23.4	27.6	48.0	53.4	58.7	64.4	21.3	25.0	30.1	36.0
Physics	31.9	37.5	45.9	51.0	19.8	25.7	32.8	37.7	42.8	48.0	55.3	62.7	31.0	35.1	43.5	51.4
Chemistry	37.3	42.8	47.6	51.3	18.2	22.3	23.4	27.5	35.1	40.8	44.8	51.6	16.3	21.4	25.2	31.5
Earth & space sciences	45.4	51.4	57.4	64.6	28.9	33.9	38.5	46.4	51.4	59.0	63.9	69.5	40.7	46.0	47.5	56.1
Mathematics	42.8	43.3	54.6	58.5	34.6	34.8	46.7	50.3	44.1	43.9	49.6	48.1	35.8	35.4	38.2	39.8
Biology	36.1	39.8	45.2	51.5	13.7	14.8	18.2	21.1	32.5	40.8	46.6	52.3	16.9	19.8	24.7	31.0
Biomedical research	41.5	45.8	51.6	58.7	19.8	24.6	27.2	32.1	50.6	57.2	62.0	67.3	24.8	29.3	34.3	42.2
Clinical medicine	48.1	52.0	55.8	60.2	11.5	15.0	18.2	21.9	60.5	65.0	70.5	74.8	16.5	20.7	25.4	29.2
Engineering	32.1	37.1	41.3	46.7	19.5	25.0	25.1	27.7	33.5	38.8	42.5	48.9	20.0	21.2	26.9	33.9
Psychology	24.7	30.7	37.8	40.6	10.3	12.5	16.4	20.4	31.6	38.2	43.9	47.8	16.7	18.4	20.0	24.3
Social sciences	21.2	28.2	28.7	29.9	13.8	16.6	18.7	18.6	27.7	28.4	33.6	43.1	15.6	13.0	18.5	25.2
Health & professional fields	27.5	31.9	32.6	42.8	11.7	14.5	16.3	17.7	28.7	36.1	41.9	50.3	13.3	16.4	19.0	22.6
	Sweden								Denmark							
Total science & engineering	56.8	59.7	63.4	66.8	24.0	28.0	34.9	39.4	57.3	60.0	63.6	68.1	25.9	29.8	37.5	44.3
Physics	50.9	57.6	67.0	70.8	39.6	44.9	55.0	59.0	63.8	65.3	71.4	75.1	55.1	58.1	64.5	67.6
Chemistry	39.9	42.6	50.6	53.2	20.9	25.6	32.4	36.2	46.2	52.9	57.3	62.6	34.5	37.4	40.1	47.9
Earth & space sciences	47.6	54.6	63.4	66.3	34.3	36.5	48.3	50.8	52.3	59.1	67.4	67.0	40.6	48.8	53.2	55.4
Mathematics	38.1	45.7	46.2	49.7	28.1	34.2	34.5	39.7	34.8	47.5	51.3	54.9	31.5	43.9	47.1	49.6
Biology	33.8	40.4	42.2	48.4	17.9	23.5	26.8	33.3	38.2	40.8	45.4	52.7	26.0	25.9	27.9	34.6
Biomedical research	59.0	62.5	64.9	69.0	30.5	33.9	40.3	45.9	58.9	65.5	65.9	70.8	32.1	34.9	41.4	48.6
Clinical medicine	67.6	69.8	72.8	75.4	20.2	24.2	29.4	33.0	62.5	64.3	68.6	73.1	16.1	20.4	28.0	33.8
Engineering	33.1	37.6	43.2	47.7	21.0	23.2	28.5	31.4	46.7	41.4	50.3	56.4	36.6	30.9	39.8	45.8
Psychology	35.1	38.1	37.4	48.7	16.3	17.5	19.7	25.1	27.1	30.6	31.4	52.8	14.6	16.5	16.9	37.7
Social sciences	26.8	27.4	34.7	35.9	20.2	16.3	26.3	25.7	18.1	19.4	21.3	33.8	9.8	13.2	14.6	24.2
Health & professional fields	40.5	37.9	48.5	51.1	15.8	13.7	22.3	23.5	32.7	32.0	42.6	42.5	15.0	12.8	27.7	23.8

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-60.
Coauthored and internationally coauthored scientific and technical articles for selected countries, by field: 1986–97
(Percentages)

Field	Percent coauthored				Percent internationally coauthored				Percent coauthored				Percent internationally coauthored			
	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97
	Finland								**Norway**							
Total science & engineering	54.5	58.9	65.0	70.2	20.9	25.6	31.4	36.1	52.5	56.8	61.8	66.9	24.1	29.0	34.6	40.5
Physics	56.0	62.3	67.8	71.6	44.3	48.6	55.5	60.3	51.6	62.0	69.6	74.2	41.8	52.3	60.1	65.3
Chemistry	35.4	44.8	55.3	55.6	19.4	27.1	36.9	36.3	43.9	48.7	50.5	58.9	27.4	36.1	37.4	40.8
Earth & space sciences	58.9	62.1	66.4	69.2	33.4	40.9	47.3	49.7	57.5	57.5	64.5	70.9	39.0	43.1	44.0	55.1
Mathematics	33.5	45.9	47.1	50.3	26.7	39.3	40.5	44.3	39.8	53.6	56.9	53.6	30.1	43.2	47.4	43.5
Biology	37.8	45.5	43.7	55.3	16.1	18.1	19.9	28.1	35.5	42.4	51.7	54.8	19.3	20.4	28.4	32.1
Biomedical research	57.5	65.6	70.7	75.7	27.5	33.7	39.2	43.4	56.1	63.1	64.2	70.5	26.3	35.6	37.6	44.8
Clinical medicine	63.3	65.6	72.8	79.1	15.8	18.9	23.8	28.4	63.0	64.8	70.1	75.5	20.5	22.9	29.3	35.4
Engineering	37.5	41.4	47.0	51.9	23.3	23.9	27.6	32.3	42.0	50.4	49.7	59.2	22.5	30.9	28.4	36.0
Psychology	25.4	33.6	38.9	47.0	13.5	14.3	22.6	25.7	29.1	29.0	34.8	44.2	15.5	15.5	19.9	27.7
Social sciences	21.3	22.5	34.3	41.1	9.4	16.5	21.0	26.2	16.2	25.9	30.1	33.1	12.0	16.1	18.7	19.4
Health & professional fields	27.8	30.4	41.4	48.9	8.0	11.5	18.6	22.3	40.4	41.9	50.0	50.5	16.9	18.7	33.5	25.5
	Switzerland								**Belgium**							
Total science & engineering	48.6	52.8	57.4	62.7	34.5	39.1	43.8	48.1	53.1	57.6	62.8	66.8	31.2	35.4	41.9	46.6
Physics	56.5	61.7	67.1	69.4	51.5	54.7	61.3	63.1	51.6	55.1	65.8	68.2	44.9	45.3	56.3	58.7
Chemistry	35.8	40.5	43.1	47.1	26.4	29.7	32.5	35.9	42.7	47.5	51.9	55.1	29.6	32.8	38.3	41.4
Earth & space sciences	51.5	60.5	61.0	68.9	40.6	49.1	51.6	56.3	53.9	63.1	65.5	69.4	39.9	51.8	55.4	57.6
Mathematics	37.1	44.7	45.0	50.6	34.9	41.7	40.1	48.3	42.6	54.7	54.5	57.5	38.6	46.6	50.7	53.1
Biology	38.2	41.6	47.5	53.2	28.7	33.4	37.4	42.0	41.6	51.2	57.4	59.0	22.7	33.4	40.7	42.4
Biomedical research	50.9	52.2	58.0	63.9	38.6	40.0	45.8	50.1	56.4	59.9	66.0	72.3	34.4	38.4	44.6	49.7
Clinical medicine	52.0	56.6	60.5	66.8	28.4	34.6	38.0	42.7	61.0	65.2	69.0	74.0	26.4	30.7	35.7	42.1
Engineering	40.2	43.7	48.6	56.2	28.5	33.1	36.1	45.0	39.9	43.2	46.5	49.0	28.0	33.3	36.0	39.2
Psychology	19.8	28.4	28.6	40.4	13.2	24.9	22.0	29.1	29.4	22.7	33.5	50.2	22.3	14.7	25.5	36.7
Social sciences	24.4	24.9	32.6	34.7	20.4	20.6	30.0	30.2	41.9	44.6	45.3	52.9	31.7	35.5	37.3	43.6
Health & professional fields	30.5	40.6	35.3	38.1	22.0	29.7	32.3	33.5	44.9	41.5	57.1	51.4	26.1	23.4	37.9	38.4
	Austria								**Ireland**							
Total science & engineering	48.6	53.5	59.1	66.1	27.1	30.5	36.3	43.6	48.3	53.4	57.3	60.1	28.9	32.0	37.4	41.9
Physics	52.0	56.5	63.5	71.7	43.7	48.7	56.0	64.1	64.3	61.5	67.5	65.0	51.0	50.8	60.6	58.4
Chemistry	34.5	39.8	45.4	53.2	20.4	25.7	31.5	39.3	42.4	54.1	52.4	59.3	34.1	42.4	41.0	50.6
Earth & space sciences	47.1	59.8	60.4	64.5	41.8	51.6	52.5	57.6	48.1	57.6	70.7	62.5	42.1	51.9	62.2	55.4
Mathematics	41.3	40.0	46.1	49.1	38.5	35.7	37.3	43.5	36.8	32.4	54.2	54.0	25.3	21.1	50.0	50.6
Biology	41.8	36.8	40.2	54.2	28.3	25.8	28.2	39.1	34.3	45.6	51.0	60.4	22.3	23.0	32.9	34.1
Biomedical research	55.1	57.1	65.7	68.9	33.7	39.4	45.7	49.8	45.8	47.3	56.9	57.3	32.9	29.0	37.7	39.3
Clinical medicine	54.1	60.5	65.9	72.1	20.7	22.5	28.8	33.8	57.0	61.1	61.4	64.5	20.7	24.3	27.2	34.9
Engineering	40.1	44.3	49.2	54.7	32.1	32.3	33.7	43.6	44.5	53.8	42.5	57.6	40.0	45.4	29.9	47.0
Psychology	28.9	36.2	29.5	41.7	19.3	21.9	19.6	25.9	40.6	60.6	61.8	60.7	25.0	36.4	55.9	57.4
Social sciences	25.1	25.7	34.7	36.7	18.3	22.0	23.0	31.1	27.3	22.2	26.0	29.6	18.2	17.0	20.6	25.9
Health & professional fields	28.7	37.5	30.8	50.0	17.2	25.0	21.8	43.3	27.1	24.0	35.3	41.3	18.6	20.0	27.9	39.1

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-60.
Coauthored and internationally coauthored scientific and technical articles for selected countries, by field: 1986–97
(Percentages)

Field	Percent coauthored				Percent internationally coauthored				Percent coauthored				Percent internationally coauthored			
	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97
	Spain								**Greece**							
Total science & engineering	43.1	48.6	54.2	58.7	18.8	24.4	28.9	32.2	42.2	48.6	56.0	61.1	27.6	31.2	36.0	38.3
Physics	53.6	59.2	63.2	68.0	35.2	41.8	46.7	48.9	53.5	56.4	69.0	73.1	42.5	45.1	56.8	61.3
Chemistry	41.0	43.7	46.9	49.2	15.2	22.5	25.5	28.5	31.2	47.0	51.4	57.0	19.1	28.4	32.7	36.2
Earth & space sciences	59.7	62.7	67.6	70.9	38.8	42.3	46.2	52.4	47.6	49.5	51.4	61.5	30.9	33.6	36.0	41.5
Mathematics	34.1	40.2	49.0	53.3	25.3	30.8	34.8	37.2	40.0	30.3	43.8	47.0	29.1	23.0	39.8	35.9
Biology	35.3	37.7	44.1	48.0	15.5	17.6	22.9	23.8	28.7	39.2	41.1	48.4	17.5	22.2	19.2	23.9
Biomedical research	34.4	42.2	51.9	58.7	13.7	21.7	28.5	32.6	50.8	56.7	67.1	65.3	34.9	39.8	45.1	44.5
Clinical medicine	50.7	55.9	61.1	65.1	14.4	15.6	19.8	22.3	48.9	53.5	61.6	65.5	23.3	25.4	27.8	27.9
Engineering	34.7	44.6	47.3	50.8	18.5	25.6	27.4	30.1	30.8	39.7	41.3	46.5	21.9	28.1	25.8	30.0
Psychology	30.2	40.8	38.6	48.2	11.3	24.3	21.5	33.9	42.9	63.6	66.7	57.1	38.1	45.5	45.5	48.6
Social sciences	31.6	34.9	44.8	50.0	22.0	23.7	27.8	32.6	34.3	27.9	38.2	43.9	24.5	15.0	30.3	30.5
Health & professional fields	30.8	40.2	44.1	44.4	18.5	23.7	23.4	23.8	34.4	43.9	47.9	53.4	20.3	29.8	34.2	37.9
	Turkey								**Portugal**							
Total science & engineering	46.3	48.0	53.0	56.3	25.1	22.8	24.5	22.6	53.5	58.3	66.8	70.0	37.6	42.5	47.9	50.8
Physics	42.7	44.3	57.0	55.9	31.5	29.9	41.5	39.7	49.3	61.9	76.1	79.8	39.7	52.1	64.1	65.0
Chemistry	43.0	50.2	47.7	52.1	22.6	24.1	25.0	20.9	56.5	60.3	69.3	67.8	43.2	49.2	53.6	50.9
Earth & space sciences	41.4	39.5	43.7	53.7	32.8	26.7	30.0	33.3	58.1	61.6	70.2	74.8	45.2	48.2	50.0	58.4
Mathematics	42.5	30.6	51.1	53.2	32.5	30.6	48.9	43.5	35.6	50.0	60.2	59.2	28.9	42.9	51.8	53.4
Biology	50.5	50.3	60.9	63.7	39.6	35.8	43.5	45.6	56.3	49.0	54.3	65.7	39.6	33.8	35.2	46.3
Biomedical research	43.7	52.1	60.6	66.5	23.0	29.3	26.3	26.4	64.8	58.9	73.8	74.6	42.3	38.0	52.1	52.8
Clinical medicine	56.7	53.0	57.2	60.3	16.6	12.4	11.7	10.9	55.2	59.6	69.6	72.9	29.6	33.1	35.9	41.0
Engineering	39.9	44.0	46.0	45.9	29.8	28.0	32.3	26.7	42.8	52.0	46.3	55.1	27.7	35.1	31.5	39.8
Psychology	21.4	36.4	41.4	19.2	21.4	27.3	20.7	19.2	60.0	52.6	42.9	48.5	60.0	47.4	21.4	39.4
Social sciences	29.4	36.5	40.0	33.0	23.5	31.7	36.9	24.8	48.4	58.6	49.0	55.2	38.7	55.2	37.3	41.8
Health & professional fields	43.5	34.1	34.0	46.5	26.1	26.8	30.2	31.0	51.6	60.5	58.3	54.2	41.9	39.5	41.7	43.8
	Yugoslavia								**Croatia**							
Total science & engineering	55.5	57.3	58.4	59.0	31.5	31.7	34.1	31.9	NA	NA	61.3	62.1	NA	NA	40.0	39.8
Physics	66.4	66.0	65.0	62.1	49.7	49.8	47.2	38.4	NA	NA	74.5	74.6	NA	NA	64.3	65.7
Chemistry	53.3	59.6	57.7	63.4	30.6	32.6	32.5	33.2	NA	NA	57.4	59.0	NA	NA	34.9	31.1
Earth & space sciences	53.5	51.9	62.6	61.8	34.3	31.2	36.7	44.1	NA	NA	50.7	55.5	NA	NA	40.0	35.5
Mathematics	35.2	38.8	41.4	51.4	31.5	30.1	35.7	48.6	NA	NA	48.1	70.0	NA	NA	48.1	56.0
Biology	61.1	54.2	53.2	58.8	39.6	37.4	33.8	28.9	NA	NA	50.8	62.8	NA	NA	32.2	36.0
Biomedical research	59.1	57.3	62.4	54.4	26.1	25.9	36.2	23.2	NA	NA	75.4	78.5	NA	NA	54.8	57.0
Clinical medicine	53.8	57.6	60.7	67.4	19.7	22.0	25.8	32.4	NA	NA	63.8	70.3	NA	NA	27.5	33.0
Engineering	43.3	53.4	47.8	42.4	22.4	27.7	26.4	21.4	NA	NA	59.7	68.6	NA	NA	27.4	50.0
Psychology	47.4	46.5	66.7	66.7	36.8	25.6	25.0	33.3	NA	NA	42.9	39.3	NA	NA	14.3	21.4
Social sciences	18.4	9.4	29.7	33.3	14.3	7.1	24.3	16.7	NA	NA	17.7	4.5	NA	NA	3.2	3.9
Health & professional fields	28.9	22.0	47.4	41.7	13.2	17.1	31.6	25.0	NA	NA	35.7	33.3	NA	NA	21.4	33.3

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-60.
Coauthored and internationally coauthored scientific and technical articles for selected countries, by field: 1986–97
(Percentages)

Field	Percent coauthored				Percent internationally coauthored				Percent coauthored				Percent internationally coauthored			
	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97
	Slovenia								Poland							
Total science & engineering	NA	NA	58.9	64.8	NA	NA	40.8	42.8	36.7	45.2	53.5	59.8	23.7	32.8	41.9	46.1
Physics	NA	NA	67.7	75.2	NA	NA	56.8	60.1	40.5	51.3	62.8	69.3	28.7	41.2	54.0	59.6
Chemistry	NA	NA	57.5	61.8	NA	NA	37.9	37.4	26.9	35.2	40.6	47.9	15.2	22.7	28.6	32.9
Earth & space sciences	NA	NA	69.7	66.7	NA	NA	39.4	34.8	54.8	57.8	62.9	66.9	42.5	48.0	56.3	57.3
Mathematics	NA	NA	36.0	50.9	NA	NA	36.0	45.5	24.4	36.0	50.6	48.4	22.8	31.9	47.3	43.5
Biology	NA	NA	51.2	55.3	NA	NA	39.5	42.4	38.0	45.9	51.8	53.3	25.1	31.6	40.2	38.6
Biomedical research	NA	NA	65.3	67.8	NA	NA	43.1	45.3	48.3	53.0	58.1	65.6	31.0	39.3	43.7	48.1
Clinical medicine	NA	NA	58.1	68.7	NA	NA	32.3	31.3	45.8	51.1	60.9	63.1	24.6	31.2	39.4	37.8
Engineering	NA	NA	46.7	47.3	NA	NA	29.9	26.3	30.6	38.0	43.1	51.3	21.3	27.0	33.4	39.7
Psychology	NA	NA	33.3	71.4	NA	NA	22.2	57.1	35.0	26.6	50.8	55.8	26.7	18.8	39.3	46.2
Social sciences	NA	NA	23.5	36.0	NA	NA	11.8	32.0	25.2	25.3	37.3	38.7	18.3	15.3	28.1	32.3
Health & professional fields	NA	NA	45.5	36.8	NA	NA	0.0	26.3	17.3	29.2	37.7	40.7	9.6	23.1	26.2	32.2
	Hungary								Czechoslovakia							
Total science & engineering	54.6	60.2	66.0	69.1	32.1	40.1	48.8	50.9	39.4	44.9	NA	NA	19.0	24.8	NA	NA
Physics	57.6	64.5	70.2	76.0	42.1	52.8	62.5	67.2	40.6	50.1	NA	NA	28.6	38.9	NA	NA
Chemistry	54.4	59.6	63.6	66.1	24.4	31.1	38.4	39.9	38.7	42.5	NA	NA	16.6	20.4	NA	NA
Earth & space sciences	60.1	68.2	61.8	72.1	49.7	56.9	49.5	59.7	37.9	53.3	NA	NA	25.9	37.8	NA	NA
Mathematics	55.3	57.5	61.2	60.5	50.8	54.7	54.6	57.3	40.0	40.2	NA	NA	31.5	31.6	NA	NA
Biology	48.1	54.7	59.6	64.8	31.9	35.5	40.7	44.1	43.4	47.5	NA	NA	24.6	26.1	NA	NA
Biomedical research	53.2	59.7	67.9	71.6	30.4	40.3	51.9	53.9	49.1	54.4	NA	NA	24.7	30.7	NA	NA
Clinical medicine	61.0	67.3	72.3	72.7	33.5	42.5	50.3	49.6	48.6	51.8	NA	NA	17.2	20.5	NA	NA
Engineering	50.0	50.9	69.7	59.9	32.3	43.0	58.2	50.0	40.0	41.3	NA	NA	19.7	25.2	NA	NA
Psychology	34.3	33.3	47.7	45.5	25.7	24.2	36.4	38.6	14.0	16.4	NA	NA	2.4	4.7	NA	NA
Social sciences	18.5	20.9	30.1	32.7	13.4	13.4	22.7	25.7	6.2	6.1	NA	NA	1.5	1.5	NA	NA
Health & professional fields	28.6	35.1	38.5	47.0	15.7	13.5	32.3	34.8	22.7	29.2	NA	NA	13.6	16.7	NA	NA
	Czech Republic								Slovakia							
Total science & engineering	NA	NA	56.8	63.7	NA	NA	42.5	46.4	NA	NA	51.2	59.0	NA	NA	34.1	43.2
Physics	NA	NA	69.3	76.9	NA	NA	62.0	66.3	NA	NA	63.1	76.6	NA	NA	53.9	71.3
Chemistry	NA	NA	50.3	56.2	NA	NA	34.1	35.7	NA	NA	51.3	54.5	NA	NA	30.8	34.7
Earth & space sciences	NA	NA	66.1	66.4	NA	NA	54.5	54.8	NA	NA	44.3	66.2	NA	NA	36.1	50.3
Mathematics	NA	NA	58.1	63.8	NA	NA	53.2	61.8	NA	NA	25.0	41.7	NA	NA	16.7	33.3
Biology	NA	NA	53.2	63.8	NA	NA	39.2	44.6	NA	NA	56.4	63.5	NA	NA	28.2	40.4
Biomedical research	NA	NA	62.2	69.8	NA	NA	44.0	47.6	NA	NA	54.3	62.8	NA	NA	34.8	44.0
Clinical medicine	NA	NA	68.0	70.9	NA	NA	42.3	46.3	NA	NA	58.3	64.9	NA	NA	27.3	36.1
Engineering	NA	NA	55.8	56.2	NA	NA	42.9	43.2	NA	NA	57.7	61.6	NA	NA	42.3	50.7
Psychology	NA	NA	29.8	36.1	NA	NA	14.9	15.2	NA	NA	6.4	9.9	NA	NA	2.1	6.6
Social sciences	NA	NA	6.5	15.5	NA	NA	4.8	9.3	NA	NA	1.5	4.2	NA	NA	0.0	3.6
Health & professional fields	NA	NA	40.0	45.0	NA	NA	20.0	35.0	NA	NA	66.7	75.0	NA	NA	66.7	50.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-60.
Coauthored and internationally coauthored scientific and technical articles for selected countries, by field: 1986–97
(Percentages)

Field	Percent coauthored				Percent internationally coauthored				Percent coauthored				Percent internationally coauthored			
	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97
	Bulgaria								**Romania**							
Total science & engineering	36.8	43.5	48.4	57.2	21.5	25.5	31.6	41.4	41.5	46.4	56.4	64.3	18.2	21.6	36.3	46.6
Physics	39.9	45.4	52.9	63.1	29.0	33.7	41.8	53.5	47.3	52.7	64.9	68.5	30.8	38.9	57.2	58.9
Chemistry	47.1	48.3	50.1	52.3	31.2	30.7	32.8	35.4	43.7	49.3	53.0	59.6	9.7	9.8	18.1	28.8
Earth & space sciences	60.2	62.5	57.7	57.6	46.3	43.3	45.1	50.0	42.9	23.5	41.2	77.0	14.3	5.9	23.5	65.6
Mathematics	28.9	40.2	45.0	57.5	19.3	29.5	38.5	46.2	24.6	27.2	48.4	57.1	16.1	20.4	46.1	51.8
Biology	50.6	47.5	53.0	54.5	32.1	24.6	31.9	26.8	25.0	26.7	50.0	78.9	25.0	20.0	29.2	68.4
Biomedical research	27.9	38.6	41.8	62.4	11.4	17.5	22.4	46.4	41.3	45.0	63.1	68.3	20.2	17.5	40.5	55.3
Clinical medicine	44.7	43.9	54.2	58.0	23.8	23.4	27.3	29.2	37.4	49.0	67.3	76.1	22.3	31.7	48.0	63.0
Engineering	31.3	42.2	43.4	51.1	20.4	20.7	24.4	37.0	43.0	42.5	49.2	58.3	19.4	24.6	31.3	38.5
Psychology	30.0	47.4	60.0	81.8	20.0	31.6	60.0	63.6	0.0	20.0	0.0	100.0	0.0	0.0	0.0	75.0
Social sciences	20.0	17.4	36.8	28.0	0.0	17.4	26.3	24.0	7.7	0.0	10.0	45.0	0.0	0.0	10.0	40.0
Health & professional fields	50.0	26.1	22.6	50.0	25.0	21.7	16.1	31.8	0.0	25.0	38.5	62.5	0.0	25.0	30.8	62.5
	India								**China**							
Total science & engineering	25.0	28.0	33.0	37.7	9.5	10.9	13.4	15.7	38.5	47.2	51.4	56.4	22.9	26.2	27.6	28.8
Physics	31.4	32.8	39.8	46.6	12.9	14.4	19.2	22.8	36.3	52.2	58.9	64.5	14.9	19.4	22.3	26.1
Chemistry	16.4	18.5	22.3	27.9	6.1	6.8	8.1	10.0	31.1	33.7	38.5	44.7	15.7	16.9	18.1	17.5
Earth & space sciences	26.8	31.5	38.6	44.6	13.8	16.6	20.4	25.2	47.4	61.8	63.7	66.8	35.4	46.1	51.7	48.1
Mathematics	38.4	39.8	41.8	41.9	29.5	26.4	30.3	29.5	33.8	36.3	40.4	43.3	28.3	29.5	29.7	30.6
Biology	21.5	26.1	29.2	33.4	10.8	13.2	14.5	16.9	57.8	64.8	59.6	66.6	50.3	55.7	47.9	49.0
Biomedical research	20.5	24.8	31.9	34.8	7.4	9.3	13.4	13.2	41.5	48.9	53.6	60.3	27.5	32.8	37.4	38.7
Clinical medicine	37.6	41.2	45.2	48.5	7.2	9.4	11.7	13.6	43.5	48.9	54.5	59.9	25.5	30.3	37.3	38.7
Engineering	27.8	31.0	33.5	36.0	10.3	11.3	11.3	13.5	34.5	40.6	43.2	47.6	25.5	26.0	25.2	27.2
Psychology	31.5	26.4	37.5	50.7	15.7	14.7	21.4	38.7	61.1	53.3	72.1	76.4	61.1	40.0	72.1	72.7
Social sciences	20.1	22.0	22.0	23.9	10.9	11.4	12.2	16.0	34.6	47.0	50.5	61.5	25.4	40.9	43.1	54.5
Health & professional fields	31.7	32.3	43.8	41.8	13.7	13.4	22.7	16.5	42.7	43.6	50.5	54.1	37.8	34.2	45.1	47.4
	Taiwan								**South Korea**							
Total science & engineering	44.8	47.5	50.2	53.9	19.8	18.0	17.7	17.7	47.8	52.0	59.9	63.0	29.3	30.0	29.3	27.6
Physics	39.2	44.2	52.5	57.2	15.4	13.9	20.0	20.8	53.8	56.1	64.2	65.2	28.7	28.5	30.8	29.6
Chemistry	29.8	36.4	38.0	37.6	10.6	9.4	10.6	8.8	33.5	42.5	51.6	53.3	12.3	15.5	16.9	15.1
Earth & space sciences	68.7	63.6	55.1	53.6	59.7	50.0	33.9	32.7	66.7	69.9	69.5	75.4	52.2	60.2	56.3	56.8
Mathematics	36.9	45.3	45.7	38.5	25.2	31.7	33.3	24.6	52.7	50.5	58.5	55.3	43.6	41.8	40.8	39.2
Biology	38.5	43.3	45.0	52.2	20.2	25.1	21.4	17.9	73.4	72.6	73.5	73.0	56.9	63.7	51.3	40.7
Biomedical research	59.8	65.6	62.7	65.4	27.9	27.4	23.4	21.2	57.0	57.3	64.7	76.5	45.1	39.7	32.7	33.2
Clinical medicine	67.9	67.8	70.6	73.9	25.8	20.6	17.2	17.1	63.2	62.6	68.5	69.7	46.3	36.5	34.1	27.9
Engineering	36.7	37.7	36.2	38.5	15.7	14.1	13.7	13.8	43.2	46.3	54.7	58.2	27.0	28.6	26.1	26.0
Psychology	53.3	54.2	71.1	62.5	40.0	37.5	51.1	50.0	80.0	72.7	77.1	76.2	80.0	63.6	77.1	69.0
Social sciences	24.3	25.5	29.2	36.4	14.8	15.9	21.8	27.7	49.2	58.7	58.4	52.2	44.3	56.0	55.2	48.4
Health & professional fields	79.2	70.2	57.1	59.2	70.8	46.8	42.9	46.0	63.9	64.9	63.2	66.5	52.8	55.4	55.8	52.1

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-60.
Coauthored and internationally coauthored scientific and technical articles for selected countries, by field: 1986–97
(Percentages)

Field	Percent coauthored				Percent internationally coauthored				Percent coauthored				Percent internationally coauthored			
	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97
	Hong Kong								Singapore							
Total science & engineering	44.7	48.9	56.7	56.7	21.9	23.4	36.3	40.0	34.3	40.0	42.4	45.7	23.7	23.4	27.6	29.6
Physics	27.5	47.3	61.2	61.0	24.5	41.9	54.9	56.0	23.4	37.5	36.7	47.5	21.1	19.1	26.3	32.1
Chemistry	41.3	42.4	48.7	48.5	32.9	30.1	39.7	39.7	29.6	39.4	39.5	53.7	16.9	16.2	23.3	31.1
Earth & space sciences	60.9	48.3	51.1	60.8	39.1	36.2	37.5	50.7	30.4	35.2	44.8	29.3	21.4	16.7	34.3	22.8
Mathematics	38.9	27.1	44.4	59.3	33.3	21.4	40.7	57.4	37.0	42.6	49.5	38.0	34.8	42.6	47.6	34.3
Biology	39.5	36.6	59.5	56.7	32.6	19.5	47.6	38.2	30.3	35.2	36.8	37.8	22.5	27.9	22.8	28.2
Biomedical research	47.6	52.1	61.1	62.4	26.6	27.4	42.6	46.5	39.2	44.2	47.6	54.1	30.0	32.2	28.8	36.4
Clinical medicine	55.2	56.4	62.9	62.8	15.6	14.2	24.7	24.8	42.2	51.1	45.6	51.2	20.5	21.5	19.8	23.8
Engineering	40.2	42.2	48.7	50.3	30.8	36.3	38.8	43.3	35.3	32.2	45.1	38.7	28.9	23.3	34.3	27.5
Psychology	27.0	37.3	42.9	47.7	20.6	31.4	36.7	39.7	22.2	41.7	35.3	61.9	22.2	41.7	35.3	52.4
Social sciences	22.3	35.5	40.3	43.5	12.8	27.1	34.6	38.8	20.7	13.7	20.5	28.4	20.7	12.6	16.1	25.4
Health & professional fields	33.7	41.1	58.9	51.3	23.2	27.1	50.3	40.0	35.2	45.5	49.0	49.2	35.2	33.8	43.0	38.9
	Thailand								Malaysia							
Total science & engineering	45.5	51.8	54.4	62.6	48.4	56.3	61.6	62.9	48.2	53.8	59.2	61.8	34.5	39.6	40.0	42.9
Physics	52.2	54.6	47.4	66.7	28.6	41.7	52.8	52.6	29.6	30.2	68.7	59.2	22.2	22.6	56.7	54.9
Chemistry	30.7	30.0	43.3	59.0	55.8	56.1	63.0	58.3	42.1	67.4	61.4	64.3	37.4	54.8	36.5	43.0
Earth & space sciences	64.7	72.7	61.1	84.2	43.2	64.3	75.9	66.2	44.8	52.8	31.0	47.5	37.9	47.2	26.2	40.7
Mathematics	28.6	27.3	40.0	85.7	71.4	100.0	100.0	100.0	36.4	35.7	38.5	28.6	36.4	35.7	23.1	28.6
Biology	42.7	49.1	54.1	60.0	72.1	67.4	74.3	71.2	45.8	63.2	60.1	66.3	35.5	52.6	48.4	52.1
Biomedical research	59.1	67.2	62.1	67.1	43.6	56.8	53.5	68.4	57.3	53.3	63.0	62.1	43.9	35.2	45.4	45.2
Clinical medicine	62.3	65.2	74.6	62.8	46.3	54.9	60.6	60.0	58.4	55.4	64.5	68.6	30.1	31.3	32.4	36.0
Engineering	41.5	58.1	57.5	61.8	29.8	43.3	48.6	51.4	69.7	42.3	58.0	57.7	63.6	36.5	52.0	41.0
Psychology	100.0	66.7	25.0	66.7	60.0	62.5	100.0	83.3	20.0	60.0	25.0	37.5	20.0	60.0	25.0	37.5
Social sciences	34.8	39.4	31.0	43.2	41.3	45.6	57.7	60.6	22.5	27.3	32.1	18.9	22.5	20.5	28.6	18.9
Health & professional fields	30.0	46.2	40.0	50.0	51.5	48.5	51.5	75.0	20.8	29.6	32.0	43.5	12.5	22.2	28.0	30.4
	Pakistan								Philippines							
Total science & engineering	51.8	56.4	60.6	64.8	34.1	38.7	39.4	42.1	50.9	63.2	64.0	70.6	45.6	57.3	61.1	65.3
Physics	52.7	59.0	64.7	70.1	39.1	39.7	36.3	43.1	25.0	61.9	30.0	64.3	25.0	61.9	25.0	50.0
Chemistry	43.0	48.1	52.6	56.1	22.9	20.7	22.5	31.3	42.1	70.0	60.0	92.3	36.8	65.0	60.0	92.3
Earth & space sciences	61.3	67.3	72.3	75.8	52.9	72.7	41.7	68.4	62.5	72.4	68.2	71.4	37.5	69.0	68.2	51.4
Mathematics	39.9	44.8	45.1	45.2	28.6	27.3	40.0	85.7	60.0	50.0	25.0	25.0	60.0	50.0	25.0	25.0
Biology	44.7	50.2	55.0	59.4	33.0	34.7	35.1	42.6	37.7	56.9	60.4	69.6	33.5	53.3	56.5	65.1
Biomedical research	53.9	58.2	61.8	66.1	47.7	50.7	56.9	57.0	67.3	71.9	73.4	77.9	67.3	64.1	68.8	76.6
Clinical medicine	60.2	62.8	66.1	69.0	40.6	48.6	58.8	40.1	88.8	84.9	84.6	84.0	77.5	68.9	83.5	78.0
Engineering	40.5	45.8	52.6	55.6	24.6	37.2	41.3	39.7	60.0	100.0	75.0	44.4	60.0	100.0	75.0	44.4
Psychology	27.9	37.2	41.7	46.9	100.0	33.3	25.0	66.7	88.9	75.0	100.0	66.7	88.9	62.5	100.0	66.7
Social sciences	26.1	29.0	33.9	44.9	34.8	39.4	31.0	29.7	42.6	44.4	54.2	48.6	36.2	40.7	54.2	45.9
Health & professional fields	33.2	35.4	42.8	50.8	30.0	46.2	40.0	45.0	36.4	41.2	22.2	42.9	36.4	41.2	22.2	35.7

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-60.
Coauthored and internationally coauthored scientific and technical articles for selected countries, by field: 1986–97
(Percentages)

Field	Percent coauthored				Percent internationally coauthored				Percent coauthored				Percent internationally coauthored			
	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97
	Indonesia								**New Zealand**							
Total science & engineering	70.7	81.3	84.2	90.3	65.5	78.2	79.2	86.2	39.5	42.4	47.9	53.1	20.4	22.4	28.4	32.9
Physics	36.4	63.6	84.6	82.4	36.4	63.6	69.2	79.4	35.5	40.7	45.5	56.6	29.7	35.7	40.7	50.7
Chemistry	58.8	96.3	92.1	98.0	52.9	92.6	89.5	96.0	40.0	36.6	39.8	48.7	32.9	26.7	33.6	40.9
Earth & space sciences	79.1	85.1	83.6	90.0	72.1	85.1	76.7	85.6	45.4	48.7	53.6	59.9	30.3	29.4	42.6	46.6
Mathematics	100.0	100.0	71.4	100.0	100.0	100.0	71.4	100.0	45.1	53.9	54.5	58.4	43.4	49.6	53.8	56.9
Biology	68.9	76.8	86.1	91.1	67.8	74.7	82.8	88.2	34.0	37.4	45.9	51.4	14.6	18.0	23.2	25.4
Biomedical research	86.1	97.4	93.2	96.2	77.8	97.4	93.2	93.7	44.5	46.8	53.3	62.6	28.4	30.1	35.4	39.4
Clinical medicine	77.9	82.9	83.2	94.8	67.5	74.8	73.3	88.5	45.0	48.7	53.7	56.6	15.1	16.5	21.7	27.0
Engineering	53.8	100.0	84.2	82.1	53.8	100.0	78.9	79.5	37.6	39.2	38.8	45.6	25.3	30.4	31.3	34.8
Psychology	66.7	83.3	100.0	100.0	66.7	83.3	100.0	100.0	30.9	34.5	38.0	39.5	16.0	24.0	24.4	29.3
Social sciences	53.6	56.8	69.4	63.4	50.0	50.0	69.4	58.5	26.7	23.2	31.5	32.5	20.8	17.0	26.7	25.3
Health & professional fields	62.5	64.3	64.7	80.0	62.5	64.3	64.7	66.7	26.8	31.5	34.4	39.6	13.9	19.8	22.0	30.0
	Former USSR								**Ukraine**							
Total science & engineering	16.8	20.0	24.0	NA	3.5	5.9	10.3	NA	NA	NA	29.5	41.2	NA	NA	23.1	33.3
Physics	10.2	16.2	23.4	NA	4.5	8.4	14.7	NA	NA	NA	28.4	42.2	NA	NA	22.7	35.2
Chemistry	15.2	16.9	18.8	NA	2.5	3.5	5.4	NA	NA	NA	27.2	37.1	NA	NA	21.1	28.9
Earth & space sciences	22.1	27.0	30.6	NA	8.1	11.8	16.3	NA	NA	NA	44.3	57.9	NA	NA	39.9	53.5
Mathematics	7.7	11.2	15.7	NA	4.3	6.2	11.5	NA	NA	NA	31.7	56.4	NA	NA	30.2	55.6
Biology	16.9	19.6	23.8	NA	3.7	5.7	8.3	NA	NA	NA	25.9	38.9	NA	NA	15.5	28.8
Biomedical research	21.8	25.9	30.0	NA	3.5	6.0	10.5	NA	NA	NA	39.5	50.0	NA	NA	35.5	42.9
Clinical medicine	24.8	26.3	30.2	NA	2.4	3.5	7.3	NA	NA	NA	30.6	53.9	NA	NA	19.2	33.4
Engineering	19.4	20.1	22.7	NA	2.7	4.5	7.4	NA	NA	NA	26.8	30.0	NA	NA	18.6	20.4
Psychology	14.1	15.8	15.2	NA	2.0	2.2	5.6	NA	NA	NA	38.5	22.7	NA	NA	23.1	13.6
Social sciences	10.8	9.7	14.7	NA	2.1	2.6	5.5	NA	NA	NA	24.0	40.0	NA	NA	4.0	32.0
Health & professional fields	13.3	12.8	16.3	NA	2.3	3.0	5.4	NA	NA	NA	3.8	11.1	NA	NA	0.0	11.1
	Belarus								**Uzbekistan**							
Total science & engineering	NA	NA	27.4	42.5	NA	NA	21.9	35.6	NA	NA	32.4	32.3	NA	NA	24.7	23.2
Physics	NA	NA	25.4	40.5	NA	NA	20.1	33.3	NA	NA	29.6	32.5	NA	NA	26.9	29.9
Chemistry	NA	NA	18.5	34.1	NA	NA	15.4	28.6	NA	NA	31.1	28.7	NA	NA	20.6	14.5
Earth & space sciences	NA	NA	11.1	50.0	NA	NA	11.1	50.0	NA	NA	53.3	53.3	NA	NA	53.3	53.3
Mathematics	NA	NA	42.3	48.6	NA	NA	42.3	45.9	NA	NA	50.0	55.6	NA	NA	25.0	44.4
Biology	NA	NA	23.8	41.9	NA	NA	23.8	38.7	NA	NA	41.7	41.2	NA	NA	41.7	29.4
Biomedical research	NA	NA	45.9	50.9	NA	NA	40.6	44.0	NA	NA	36.1	41.9	NA	NA	25.0	34.9
Clinical medicine	NA	NA	46.3	77.2	NA	NA	35.8	68.3	NA	NA	40.7	47.6	NA	NA	18.5	42.9
Engineering	NA	NA	36.8	47.7	NA	NA	21.8	35.8	NA	NA	14.3	38.9	NA	NA	7.1	33.3
Psychology	NA	NA	0.0	0.0	NA	NA	0.0	0.0	NA	NA	NA	NA	NA	NA	NA	NA
Social sciences	NA	NA	30.0	27.3	NA	NA	0.0	18.2	NA	NA	0.0	100.0	NA	NA	0.0	100.0
Health & professional fields	NA	NA	50.0	60.0	NA	NA	50.0	60.0	NA	NA	0.0	NA	NA	NA	0.0	NA

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-60.
Coauthored and internationally coauthored scientific and technical articles for selected countries, by field: 1986–97
(Percentages)

Field	Percent coauthored				Percent internationally coauthored				Percent coauthored				Percent internationally coauthored			
	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97
	Armenia								**Estonia**							
Total science & engineering	NA	NA	39.4	47.3	NA	NA	35.8	41.9	NA	NA	56.4	65.3	NA	NA	48.6	54.6
Physics	NA	NA	35.6	48.6	NA	NA	34.1	47.0	NA	NA	44.8	61.5	NA	NA	38.8	46.4
Chemistry	NA	NA	24.1	23.4	NA	NA	22.4	18.1	NA	NA	58.0	67.2	NA	NA	47.8	51.5
Earth & space sciences	NA	NA	71.0	74.5	NA	NA	67.7	72.5	NA	NA	69.4	65.7	NA	NA	58.3	61.1
Mathematics	NA	NA	42.9	72.7	NA	NA	28.6	45.5	NA	NA	100.0	50.0	NA	NA	100.0	50.0
Biology	NA	NA	41.7	47.1	NA	NA	25.0	41.2	NA	NA	41.7	54.3	NA	NA	38.9	42.9
Biomedical research	NA	NA	44.7	58.8	NA	NA	42.6	40.0	NA	NA	69.4	80.3	NA	NA	58.1	75.2
Clinical medicine	NA	NA	51.4	51.7	NA	NA	37.8	34.5	NA	NA	65.8	70.7	NA	NA	60.5	60.9
Engineering	NA	NA	37.5	4.5	NA	NA	37.5	4.5	NA	NA	33.3	61.5	NA	NA	22.2	57.7
Psychology	NA	NA	100.0	0.0	NA	NA	100.0	0.0	NA	NA	60.0	14.3	NA	NA	60.0	14.3
Social sciences	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	38.5	50.0	NA	NA	30.8	41.7
Health & professional fields	NA	NA	NA	100.0	NA	NA	NA	100.0	NA	NA	100.0	40.0	NA	NA	100.0	40.0
	Latvia								**Lithuania**							
Total science & engineering	NA	NA	51.7	58.9	NA	NA	47.6	53.0	NA	NA	50.4	59.1	NA	NA	45.6	52.7
Physics	NA	NA	58.7	73.5	NA	NA	54.2	68.7	NA	NA	50.0	58.8	NA	NA	47.8	52.7
Chemistry	NA	NA	40.8	32.7	NA	NA	39.5	24.4	NA	NA	33.8	48.7	NA	NA	29.9	42.3
Earth & space sciences	NA	NA	35.3	60.0	NA	NA	35.3	56.7	NA	NA	76.9	64.0	NA	NA	76.9	64.0
Mathematics	NA	NA	50.0	57.1	NA	NA	50.0	28.6	NA	NA	63.6	77.8	NA	NA	54.5	66.7
Biology	NA	NA	55.6	42.1	NA	NA	55.6	42.1	NA	NA	55.6	53.8	NA	NA	55.6	46.2
Biomedical research	NA	NA	72.5	64.9	NA	NA	65.0	59.7	NA	NA	63.6	64.6	NA	NA	58.2	56.6
Clinical medicine	NA	NA	57.5	73.5	NA	NA	45.0	65.3	NA	NA	65.0	82.5	NA	NA	47.5	73.0
Engineering	NA	NA	47.6	57.9	NA	NA	47.6	55.3	NA	NA	37.1	50.8	NA	NA	31.4	47.7
Psychology	NA	NA	0.0	25.0	NA	NA	0.0	25.0	NA	NA	NA	100.0	NA	NA	NA	100.0
Social sciences	NA	NA	0.0	100.0	NA	NA	0.0	100.0	NA	NA	0.0	40.0	NA	NA	0.0	20.0
Health & professional fields	NA	NA	75.0	50.0	NA	NA	50.0	50.0	NA	NA	NA	80.0	NA	NA	NA	80.0
	Brazil								**Argentina**							
Total science & engineering	51.6	56.3	62.4	67.3	28.3	31.9	38.0	41.1	40.4	46.1	54.9	59.3	15.0	23.1	32.0	32.5
Physics	47.9	55.3	63.8	66.7	30.6	36.6	45.6	48.5	45.5	52.3	63.4	71.4	21.3	32.5	44.4	44.8
Chemistry	46.6	52.7	59.1	58.3	21.7	31.2	36.0	32.1	25.4	33.0	44.8	51.2	9.5	16.6	24.1	29.5
Earth & space sciences	51.9	57.0	64.3	74.4	37.6	44.2	50.4	63.0	58.4	58.7	68.7	70.9	24.4	36.7	44.8	45.4
Mathematics	53.8	51.0	52.3	59.8	40.0	39.3	38.2	45.9	50.0	58.5	52.0	53.3	32.8	47.7	41.3	40.0
Biology	54.5	57.7	59.3	68.3	35.7	37.2	35.8	42.0	41.6	41.5	49.8	52.0	19.7	20.7	27.9	25.8
Biomedical research	53.2	56.2	63.1	69.1	25.1	24.5	34.4	36.6	37.6	46.1	54.6	61.0	12.6	22.5	31.9	33.6
Clinical medicine	58.4	61.2	66.6	71.8	25.8	29.8	35.0	36.3	44.4	48.6	55.6	57.4	11.1	16.2	26.5	25.7
Engineering	54.9	57.3	57.2	66.3	35.9	36.7	36.5	39.2	41.6	47.9	56.0	52.0	16.4	27.3	31.5	24.5
Psychology	32.6	39.1	47.6	54.0	13.1	17.4	28.6	40.2	21.2	37.9	46.8	38.8	9.1	27.6	34.0	36.7
Social sciences	44.3	43.5	42.3	49.2	30.9	27.4	25.2	35.4	36.3	34.7	39.1	40.0	18.8	13.9	18.4	18.8
Health & professional fields	46.0	48.6	63.6	63.3	10.7	14.7	15.3	19.1	20.0	45.5	36.4	61.5	10.0	31.8	15.2	30.8

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-60.
Coauthored and internationally coauthored scientific and technical articles for selected countries, by field: 1986–97
(Percentages)

Field	Percent coauthored				Percent internationally coauthored				Percent coauthored				Percent internationally coauthored			
	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97
	Mexico								**Chile**							
Total science & engineering	53.3	56.4	60.6	64.7	30.3	34.1	39.4	42.8	49.8	58.0	63.7	67.8	29.7	33.5	40.8	45.8
Physics	51.1	58.8	62.8	66.3	30.0	37.9	42.9	47.9	65.4	69.9	64.1	69.9	51.6	58.5	51.1	57.4
Chemistry	54.6	58.5	59.9	67.3	33.8	35.5	33.0	42.6	41.3	51.0	54.7	62.9	30.6	36.6	40.2	48.3
Earth & space sciences	50.7	65.5	71.4	68.5	41.2	53.2	60.0	58.3	58.1	73.4	81.8	86.1	57.7	68.9	77.0	82.4
Mathematics	41.1	44.4	61.3	62.5	38.9	36.7	46.3	51.0	49.0	59.1	69.4	70.3	40.8	47.0	59.7	60.4
Biology	56.8	54.6	52.1	58.7	38.4	38.3	36.3	40.3	50.2	57.8	59.8	64.5	37.2	40.5	43.3	43.1
Biomedical research	49.1	53.1	62.4	68.1	24.3	31.4	39.7	44.1	47.6	54.0	63.9	70.5	32.1	33.9	40.2	47.9
Clinical medicine	56.8	58.5	63.3	64.8	18.8	23.0	32.1	30.4	50.0	56.3	61.2	63.0	12.7	13.2	20.6	24.8
Engineering	61.2	55.2	60.7	66.5	44.6	34.9	43.0	47.3	41.0	47.4	67.8	60.5	36.1	39.5	62.1	49.6
Psychology	50.0	45.5	54.1	50.6	36.8	33.3	28.4	28.4	31.3	38.9	35.7	61.5	18.8	16.7	21.4	15.4
Social sciences	46.5	40.0	41.7	44.1	41.4	37.6	38.8	38.2	34.9	47.4	56.0	47.2	25.6	42.1	40.0	43.4
Health & professional fields	40.7	32.5	45.2	50.7	37.0	27.5	35.5	42.0	40.0	46.4	40.5	61.0	25.0	21.4	27.0	41.5
	Venezuela								**Colombia**							
Total science & engineering	49.7	57.3	62.8	63.4	33.1	42.3	44.8	45.5	60.2	64.5	70.6	76.0	50.6	56.1	60.4	66.7
Physics	48.1	56.6	66.3	68.0	30.7	45.5	50.8	57.6	77.8	67.6	68.9	78.3	77.8	67.6	64.9	74.7
Chemistry	44.8	52.4	57.5	57.7	33.7	40.5	41.1	38.9	63.6	50.0	87.0	71.9	63.6	50.0	78.3	70.3
Earth & space sciences	47.4	75.8	66.3	70.1	31.6	56.5	59.2	58.6	68.4	84.6	95.2	87.8	68.4	76.9	90.5	75.5
Mathematics	65.6	50.0	54.7	63.2	50.0	42.5	49.1	56.1	33.3	100.0	55.6	72.7	33.3	100.0	33.3	63.6
Biology	43.4	62.4	60.4	59.1	38.5	52.9	43.6	42.8	56.2	62.0	58.7	70.4	52.1	60.1	52.7	62.2
Biomedical research	43.3	56.5	59.8	70.0	30.4	41.9	44.5	46.4	66.7	60.7	82.3	80.5	56.4	55.4	72.6	66.9
Clinical medicine	66.4	66.7	71.5	73.4	33.2	39.0	41.4	44.6	69.3	73.2	82.4	83.6	49.1	52.9	62.7	68.6
Engineering	38.0	42.9	59.4	46.7	30.0	31.4	37.5	41.1	41.7	70.0	76.9	80.0	33.3	50.0	76.9	71.4
Psychology	46.2	21.4	40.0	13.8	38.5	21.4	30.0	10.3	0.0	20.0	38.9	31.3	0.0	13.3	16.7	25.0
Social sciences	23.8	34.8	43.8	58.8	19.0	21.7	43.8	35.3	57.1	42.9	47.1	41.2	50.0	38.1	47.1	29.4
Health & professional fields	62.5	18.2	26.7	28.0	50.0	13.6	26.7	20.0	30.8	60.0	37.5	42.9	23.1	40.0	37.5	42.9
	Cuba								**Israel**							
Total science & engineering	57.7	68.4	60.0	70.3	50.7	54.0	44.8	57.5	58.4	61.5	63.7	65.6	28.2	31.8	36.2	37.5
Physics	50.0	81.0	57.1	78.3	40.4	69.8	53.2	73.3	54.6	59.0	62.3	63.6	43.2	47.5	51.3	51.3
Chemistry	41.9	74.7	67.7	74.8	34.9	53.3	44.6	60.2	42.1	50.5	56.0	57.0	26.9	33.3	38.8	39.9
Earth & space sciences	100.0	72.2	72.7	75.0	100.0	72.2	72.7	75.0	56.3	62.1	63.1	64.4	35.7	45.2	45.2	47.4
Mathematics	0.0	100.0	33.3	72.7	0.0	100.0	33.3	72.7	55.3	57.2	60.5	58.6	50.6	54.8	53.5	53.8
Biology	75.7	75.4	59.6	86.7	73.0	50.8	51.9	80.7	48.0	52.9	58.0	60.1	22.3	26.5	32.5	31.4
Biomedical research	63.5	73.2	56.6	63.8	57.7	66.1	46.0	48.9	58.6	63.6	64.7	68.2	33.0	36.9	41.8	44.2
Clinical medicine	56.3	53.1	63.6	62.4	46.9	38.3	35.4	36.9	74.6	75.5	75.3	77.9	16.6	19.3	23.1	24.3
Engineering	70.0	77.8	76.9	46.2	60.0	77.8	38.5	41.0	47.2	48.8	52.8	53.5	33.2	36.2	39.4	38.3
Psychology	100.0	20.0	33.3	50.0	100.0	20.0	33.3	50.0	36.2	41.5	44.1	48.9	21.3	25.8	24.2	28.8
Social sciences	0.0	16.7	20.0	62.5	0.0	0.0	13.3	62.5	43.9	41.6	43.1	46.0	31.9	30.2	33.6	32.7
Health & professional fields	100.0	50.0	100.0	50.0	100.0	33.3	75.0	50.0	46.2	50.3	48.4	52.7	31.8	33.1	33.3	32.4

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-60.
Coauthored and internationally coauthored scientific and technical articles for selected countries, by field: 1986–97
(Percentages)

Field	Percent coauthored				Percent internationally coauthored				Percent coauthored				Percent internationally coauthored			
	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97
	Saudi Arabia								Iran							
Total science & engineering	40.7	46.8	44.6	46.8	22.4	25.0	22.4	25.1	50.7	50.8	50.4	56.5	38.3	38.4	37.7	32.7
Physics	44.8	52.6	42.4	40.8	38.1	40.6	28.5	27.6	46.2	56.5	64.3	72.0	38.5	47.8	41.7	35.3
Chemistry	31.0	32.9	29.6	35.4	23.0	26.8	23.8	27.8	35.2	20.5	32.5	40.1	35.2	13.7	20.8	15.7
Earth & space sciences	45.5	40.2	36.5	42.6	35.1	28.6	24.0	30.7	63.6	75.0	58.8	76.7	59.1	50.0	41.2	62.8
Mathematics	39.6	33.3	26.3	26.7	37.7	33.3	26.3	22.2	51.9	42.9	41.7	47.6	37.0	35.7	41.7	23.8
Biology	30.6	41.7	40.6	44.7	25.8	34.1	30.0	32.6	54.7	63.8	64.9	67.5	35.8	57.4	61.4	58.8
Biomedical research	47.1	56.1	54.5	50.8	22.1	32.5	33.3	27.1	44.4	64.7	66.7	69.2	25.9	41.2	45.5	53.8
Clinical medicine	48.3	58.4	55.2	57.1	15.2	19.8	17.1	20.6	48.5	51.1	43.8	54.5	22.1	27.8	25.0	22.3
Engineering	30.5	30.3	33.6	37.3	24.3	23.6	23.0	30.8	64.7	66.0	68.0	65.5	64.7	63.8	66.0	59.5
Psychology	14.3	42.9	71.4	50.0	14.3	28.6	71.4	50.0	100.0	50.0	50.0	60.0	0.0	50.0	50.0	40.0
Social sciences	35.3	26.1	55.6	18.8	23.5	21.7	55.6	18.8	42.9	42.9	28.6	85.7	35.7	42.9	28.6	71.4
Health & professional fields	34.0	33.3	31.3	31.0	25.5	15.7	15.6	15.5	75.0	42.9	18.2	20.0	50.0	14.3	9.1	20.0
	Jordan								Kuwait							
Total science & engineering	45.1	45.6	50.6	53.8	29.3	28.0	34.3	36.5	46.1	47.6	52.8	53.9	23.3	25.9	37.0	38.4
Physics	34.9	41.4	40.3	52.0	33.3	39.7	36.1	45.0	39.5	27.1	29.4	45.5	37.2	22.9	23.5	45.5
Chemistry	42.9	32.5	63.3	49.5	31.1	19.0	60.0	44.1	31.1	26.9	46.7	54.2	24.3	23.7	40.0	50.5
Earth & space sciences	52.6	61.5	66.7	66.7	36.8	30.8	51.9	53.8	35.3	25.0	58.8	41.7	21.6	20.0	35.3	27.1
Mathematics	7.7	20.0	53.8	54.5	7.7	20.0	53.8	54.5	37.5	38.9	75.0	55.6	37.5	36.1	75.0	50.0
Biology	34.1	50.0	39.5	44.9	24.4	37.0	21.1	34.7	35.9	32.8	40.9	47.1	33.3	19.7	36.4	35.3
Biomedical research	57.7	33.3	55.9	57.1	57.7	25.6	20.6	40.0	52.9	55.9	56.8	72.7	23.6	30.9	43.2	48.5
Clinical medicine	66.7	60.1	61.4	65.0	28.2	24.5	21.9	25.0	61.2	65.9	66.9	68.9	18.2	24.6	35.5	32.3
Engineering	40.3	48.2	41.2	45.0	23.9	34.9	36.8	27.5	37.1	41.8	40.0	38.2	25.7	27.1	32.7	32.1
Psychology	100.0	66.7	45.5	100.0	66.7	66.7	45.5	100.0	25.0	45.5	66.7	37.5	25.0	45.5	44.4	37.5
Social sciences	25.0	30.0	31.8	23.1	25.0	25.0	27.3	7.7	11.1	33.3	36.4	43.8	0.0	16.7	36.4	31.3
Health & professional fields	11.8	33.3	18.2	42.9	5.9	25.0	18.2	28.6	20.0	40.0	58.3	50.0	15.0	35.0	58.3	50.0
	South Africa								Egypt							
Total science & engineering	47.5	49.9	50.5	55.2	13.7	17.1	21.5	28.7	45.4	47.4	49.7	52.3	23.6	25.2	27.5	31.1
Physics	41.1	48.3	54.1	71.8	22.1	28.9	37.8	58.8	49.9	42.9	47.7	46.6	28.2	21.4	27.3	24.5
Chemistry	24.3	29.1	33.1	37.1	10.0	14.1	17.4	23.0	35.6	36.6	40.2	42.1	12.1	12.1	15.8	19.4
Earth & space sciences	39.4	51.3	51.1	56.8	22.7	31.4	32.6	38.3	47.1	41.4	51.7	61.6	28.4	29.3	33.2	42.9
Mathematics	40.1	46.8	47.5	56.9	27.2	30.3	36.6	49.5	40.5	41.9	31.9	52.6	37.8	35.5	31.9	44.7
Biology	34.0	38.8	44.5	49.3	13.7	14.0	18.9	23.3	48.8	58.4	62.2	65.2	28.8	38.9	42.8	48.9
Biomedical research	44.3	49.0	51.3	58.1	14.3	18.4	22.5	30.7	50.7	57.5	52.3	65.5	27.8	37.5	36.1	39.3
Clinical medicine	70.6	68.7	68.9	68.8	10.7	12.5	17.8	22.5	59.4	64.2	64.6	64.4	33.3	38.6	39.5	42.8
Engineering	26.1	33.3	32.1	39.6	11.9	17.6	17.4	26.1	45.4	48.5	48.9	47.9	26.4	27.5	24.5	28.2
Psychology	35.7	40.0	35.5	39.4	16.3	15.0	17.7	24.1	54.5	77.8	100.0	85.7	54.5	77.8	100.0	85.7
Social sciences	21.7	22.3	21.6	25.5	11.4	14.2	12.0	16.6	59.1	60.6	45.2	44.8	56.8	57.6	38.7	34.5
Health & professional fields	26.3	36.2	26.1	37.6	14.4	19.5	9.7	19.7	78.6	62.5	69.0	62.5	78.6	56.3	62.1	43.8

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-60.
Coauthored and internationally coauthored scientific and technical articles for selected countries, by field: 1986–97
(Percentages)

Field	Percent coauthored				Percent internationally coauthored				Percent coauthored				Percent internationally coauthored			
	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97	1986-88	1989-91	1992-94	1995-97
	Nigeria								**Kenya**							
Total science & engineering	32.8	36.8	46.3	52.5	16.3	18.9	26.4	32.0	53.3	58.9	64.7	73.4	41.2	45.2	52.0	62.7
Physics	31.4	46.5	50.0	67.3	25.7	37.2	38.6	59.2	22.2	30.0	42.9	55.6	22.2	30.0	42.9	55.6
Chemistry	33.0	35.3	57.4	52.2	25.2	27.0	41.9	39.7	50.0	87.5	71.4	55.6	50.0	87.5	71.4	44.4
Earth & space sciences	29.2	46.8	44.9	55.7	20.0	36.7	25.8	34.4	43.8	38.7	63.0	65.7	43.8	38.7	54.3	65.7
Mathematics	23.3	33.3	22.2	35.3	20.9	33.3	11.1	35.3	0.0	16.7	100.0	100.0	0.0	16.7	50.0	100.0
Biology	28.4	32.6	42.5	44.3	15.8	16.9	26.8	28.1	51.2	60.9	54.8	70.5	43.8	54.2	46.7	62.9
Biomedical research	34.7	43.3	55.5	48.1	17.3	22.1	36.8	29.4	50.3	53.7	62.2	79.4	40.7	46.3	56.1	74.4
Clinical medicine	45.7	44.7	52.6	63.9	16.0	15.9	21.9	30.6	57.8	64.0	69.1	75.9	41.0	41.9	51.1	60.4
Engineering	36.0	28.8	36.7	57.5	27.9	18.9	30.0	45.0	0.0	61.5	84.6	25.0	0.0	61.5	76.9	25.0
Psychology	13.9	5.6	25.0	42.9	2.8	5.6	15.0	42.9	78.3	75.0	86.7	72.7	78.3	75.0	86.7	72.7
Social sciences	11.4	22.3	32.3	34.6	7.1	17.6	25.0	30.8	38.1	38.6	62.0	65.2	35.7	36.4	60.0	60.9
Health & professional fields	15.7	19.6	22.4	37.2	8.0	12.2	13.1	25.6	30.0	28.0	43.8	53.3	16.7	28.0	37.5	53.3
	Morocco								**Algeria**							
Total science & engineering	72.8	82.8	87.4	85.4	67.3	80.4	82.9	78.1	71.3	71.6	72.0	74.8	67.1	64.6	67.7	71.3
Physics	84.9	88.2	81.6	85.8	81.1	86.8	74.1	76.6	63.6	68.6	70.7	71.9	59.1	60.0	67.5	68.8
Chemistry	77.2	84.7	92.2	90.8	74.3	84.7	88.1	84.8	73.4	73.8	75.4	81.9	70.3	71.0	74.6	77.8
Earth & space sciences	84.2	88.5	88.3	87.7	78.9	80.8	86.7	85.2	100.0	100.0	84.4	92.3	100.0	100.0	78.1	89.7
Mathematics	78.6	76.9	75.0	54.9	71.4	76.9	67.5	49.3	58.3	54.5	60.0	52.6	58.3	54.5	60.0	47.4
Biology	66.7	84.3	83.7	94.0	58.3	77.4	78.6	88.9	41.4	67.7	64.5	76.9	41.4	61.3	64.5	69.2
Biomedical research	85.2	86.1	95.6	93.6	77.8	86.1	95.6	89.4	86.2	95.8	77.1	70.0	79.3	83.3	74.3	67.5
Clinical medicine	61.5	66.7	88.0	74.4	50.0	62.5	81.0	60.4	80.6	72.7	75.0	72.3	72.6	65.5	61.7	68.1
Engineering	64.5	91.8	90.3	84.5	64.5	91.8	89.2	77.3	66.7	68.8	68.1	70.2	66.7	54.2	60.4	68.1
Psychology	100.0	100.0	NA	100.0	100.0	100.0	NA	100.0	80.0	100.0	NA	NA	80.0	100.0	NA	NA
Social sciences	41.7	60.0	42.9	60.0	33.3	60.0	42.9	60.0	50.0	22.2	50.0	50.0	30.0	22.2	50.0	50.0
Health & professional fields	0.0	42.9	75.0	75.0	0.0	42.9	75.0	75.0	50.0	57.1	50.0	75.0	50.0	42.9	50.0	75.0
	Tunisia								**World**							
Total science & engineering	70.6	68.4	74.6	69.6	59.2	54.3	59.8	53.7	38.6	42.0	45.8	50.1	7.8	9.5	12.2	14.8
Physics	65.0	81.8	83.3	82.7	60.0	79.5	77.8	77.3	32.2	37.0	43.3	49.0	11.1	13.7	18.4	22.4
Chemistry	79.5	59.9	65.9	51.0	68.2	42.3	55.3	38.7	26.7	30.1	34.0	38.5	6.7	8.3	10.7	12.8
Earth & space sciences	66.7	80.0	84.2	90.9	66.7	76.0	84.2	84.8	39.7	44.8	49.1	54.3	13.3	16.7	20.1	24.1
Mathematics	30.4	26.3	47.8	44.4	30.4	26.3	47.8	38.9	28.6	32.1	35.8	38.2	14.4	16.1	18.6	20.6
Biology	80.8	75.0	81.0	73.5	73.1	65.6	71.4	57.1	31.4	36.2	39.9	44.5	7.4	9.3	11.4	13.9
Biomedical research	86.4	83.8	77.8	76.7	77.3	81.1	68.9	61.7	41.5	45.9	50.6	54.9	9.1	11.0	13.8	16.2
Clinical medicine	71.7	67.9	77.8	77.4	47.2	44.8	48.0	44.1	52.4	54.7	57.6	61.3	6.3	7.6	9.6	11.5
Engineering	72.7	100.0	77.3	65.1	72.7	92.9	77.3	60.5	29.9	33.3	36.4	39.8	7.1	8.7	10.4	12.7
Psychology	NA	NA	100.0	0.0	NA	NA	100.0	0.0	30.6	33.2	36.3	38.6	4.1	5.3	6.5	8.5
Social sciences	80.0	71.4	100.0	80.0	80.0	57.1	100.0	80.0	23.4	24.7	26.5	29.2	5.4	5.8	7.3	8.6
Health & professional fields	0.0	0.0	33.3	40.0	0.0	0.0	33.3	40.0	29.6	31.6	32.9	36.7	3.3	3.8	4.8	6.4

NA = not applicable

NOTE: The database consists of the Institute for Scientific Information's Science and Social Science Citation Indexes (SCI, SSCI). The international coauthorship percentages for world totals appear low when compared to those of individual countries, reflecting a technical artifact. National rates are based on total counts: each collaborating country is assigned one paper—that is, a paper with three international coauthors may contribute to the international coauthorship of three countries. For world totals, each internationally coauthored paper is counted only once. (In 1997, an average of 2.22 countries were involved in each internationally coauthored paper.)

SOURCES: Institute for Scientific Information, Science Citation Index and Social Science Citation Index; CHI Research, Inc., Science Indicators database; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See page 6-48 in Volume 1.

Appendix table 6-61.
Patterns of international coauthorship in scientific and technical research for selected countries: 1986–97
(Percentages of internationally coauthored papers)

Code	Country	Year	Collaborating country (by country code)																							
			US	Jap	UK	Ger	Fra	Can	Rus	Ital	Atral	Neth	Swe	Den	Fin	Nor	Swit	Belg	Aus	Ire	Spn	Grce	Tur	Por	Yug	Cro	Slvn
US	United States	1986-88		8.2	12.7	11.8	8.3	13.8	0.0	5.7	4.0	3.4	4.1	1.7	1.2	1.0	4.1	1.9	1.0	0.3	1.7	0.9	0.2	0.2	0.8	0.0	0.0
	United States	1995-97		9.6	12.4	12.8	8.9	12.2	3.6	6.7	4.1	4.2	3.5	2.0	1.6	1.1	4.2	2.0	1.4	0.4	3.1	0.9	0.5	0.4	0.1	0.2	0.2
Jap	Japan	1986-88	54.0		7.0	10.2	5.1	6.0	0.0	2.1	2.1	2.0	2.0	0.8	0.6	0.4	2.5	1.5	0.8	0.2	0.8	0.2	0.1	0.0	0.2	0.0	0.0
	Japan	1995-97	45.6		9.1	9.9	5.7	5.8	4.1	3.5	3.5	2.7	2.6	1.1	1.1	0.6	2.8	1.2	0.7	0.2	1.1	0.3	0.3	0.2	0.1	0.1	0.1
UK	United Kingdom	1986-88	33.9	2.9		10.2	8.2	7.2	0.0	6.1	5.5	4.8	3.7	2.4	1.1	1.3	3.9	2.4	0.9	1.6	2.8	1.3	0.4	0.8	0.5	0.0	0.0
	United Kingdom	1995-97	30.6	4.7		12.6	10.7	5.9	3.2	7.8	5.3	6.5	3.8	3.0	1.5	1.5	4.5	3.1	1.4	1.8	5.0	1.7	0.7	1.3	0.1	0.1	0.3
Ger	Germany	1986-88	31.1	4.1	10.2		9.5	3.2	0.0	5.5	1.8	5.1	3.7	2.3	1.4	1.0	8.3	2.8	4.1	0.3	1.9	0.8	0.4	0.3	1.6	0.0	0.0
	Germany	1995-97	30.0	4.9	11.9		11.5	3.8	8.4	7.1	2.6	5.9	3.8	2.7	1.7	1.2	8.2	3.0	4.5	0.5	3.7	1.6	0.4	0.7	0.2	0.5	0.4
Fra	France	1986-88	28.9	2.7	10.7	12.5		7.5	0.0	8.6	1.2	4.0	2.9	1.5	0.7	0.6	7.5	6.0	1.0	0.4	4.6	1.1	0.1	0.7	0.6	0.0	0.0
	France	1995-97	26.1	3.5	12.7	14.4		6.2	5.8	10.1	2.0	5.0	3.1	1.9	1.4	1.2	7.1	6.2	1.4	0.5	6.9	1.8	0.3	1.3	0.1	0.2	0.2
Can	Canada	1986-88	54.4	3.6	10.6	4.8	8.4		0.0	2.1	3.2	2.2	2.1	1.1	0.8	0.6	2.1	1.3	0.5	0.5	0.6	0.5	0.2	0.2	0.4	0.0	0.0
	Canada	1995-97	53.0	5.3	10.4	7.0	9.1		2.3	3.7	3.8	2.9	2.2	1.5	1.0	0.7	2.8	1.5	0.9	0.4	1.8	0.5	0.2	0.3	0.1	0.1	0.1
Rus	Russia	1986-88	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Russia	1995-97	23.1	5.4	8.3	23.0	12.6	3.3		7.3	1.4	3.9	4.2	2.1	3.1	1.8	4.2	2.6	1.2	0.3	2.6	1.0	0.3	0.8	0.2	0.2	0.2
Ital	Italy	1986-88	35.7	2.0	14.5	13.1	15.5	3.3	0.0		1.0	4.3	3.9	2.0	0.9	0.6	9.8	3.6	1.7	0.4	3.6	0.6	0.1	0.2	1.0	0.0	0.0
	Italy	1995-97	32.6	3.5	15.4	14.8	16.7	4.2	5.6		1.7	5.7	3.6	2.7	1.7	1.2	9.0	3.5	2.1	0.6	6.5	1.9	0.3	1.1	0.2	0.5	0.5
Atral	Australia	1986-88	40.4	3.3	21.2	6.8	3.6	8.4	0.0	1.6		2.0	2.0	1.3	0.6	0.6	2.1	0.8	0.6	0.4	0.3	0.1	0.1	0.0	0.1	0.0	0.0
	Australia	1995-97	36.5	6.5	19.0	9.8	6.0	7.9	1.9	3.1		3.3	3.8	1.9	0.8	0.7	2.4	1.4	1.1	0.4	1.2	0.2	0.1	0.2	0.1	0.3	0.1
Neth	Netherlands	1986-88	31.1	2.7	16.4	17.5	10.4	5.0	0.0	6.2	1.8		3.9	2.3	2.0	1.2	5.6	9.4	1.9	0.7	2.2	0.4	0.2	0.4	0.5	0.0	0.0
	Netherlands	1995-97	29.2	3.9	18.4	17.6	11.8	4.6	4.2	8.1	2.6		4.6	3.5	2.3	1.9	5.9	9.5	1.8	1.0	4.6	1.0	0.3	1.2	0.1	0.2	0.4
Swe	Sweden	1986-88	36.1	2.7	12.0	12.1	7.4	4.6	0.0	5.4	1.7	3.7		8.8	5.8	6.6	5.1	2.5	1.2	0.2	1.2	0.7	0.1	0.2	1.2	0.0	0.0
	Sweden	1995-97	28.8	4.5	12.6	13.5	8.8	4.1	5.5	6.0	3.5	5.4		9.1	7.3	7.3	4.0	3.7	1.4	0.5	3.1	0.9	0.2	0.9	0.1	0.2	0.5
Den	Denmark	1986-88	29.6	2.0	15.4	14.8	7.3	4.9	0.0	5.5	2.2	4.4	17.2		3.4	5.2	4.5	1.6	1.0	0.2	1.6	0.4	0.2	0.4	0.3	0.0	0.0
	Denmark	1995-97	29.0	3.4	17.9	16.4	9.6	4.9	4.8	8.1	3.0	7.3	15.9		4.5	6.5	5.1	3.0	2.1	0.7	5.5	2.3	0.2	0.8	0.0	0.2	0.3
Fin	Finland	1986-88	33.1	2.4	11.2	14.7	5.6	5.7	0.0	4.1	1.7	6.1	18.0	5.4		3.4	5.2	2.6	1.8	0.4	0.9	0.3	0.2	0.2	0.4	0.0	0.0
	Finland	1995-97	32.1	4.8	12.4	14.9	9.3	4.7	9.8	7.1	1.8	6.7	17.7	6.3		6.7	5.9	3.8	2.1	0.8	3.7	2.4	0.3	1.8	0.2	0.4	0.3
Nor	Norway	1986-88	30.7	1.6	14.8	11.1	4.9	4.2	0.0	2.8	1.7	3.8	22.3	9.0	3.6		3.9	2.2	1.1	0.3	0.5	0.3	0.0	0.9	1.2	0.0	0.0
	Norway	1995-97	26.9	3.4	15.0	13.5	10.0	4.0	7.3	6.6	2.1	7.0	22.7	11.6	8.5		6.0	4.0	1.5	0.7	3.6	3.2	0.2	2.4	0.1	0.1	0.1
Swit	Switzerland	1986-88	31.8	3.0	11.5	24.5	16.8	4.2	0.0	12.3	1.6	4.8	4.6	2.1	1.5	1.0		3.8	3.2	0.3	2.3	1.3	0.1	0.2	0.9	0.0	0.0
	Switzerland	1995-97	31.4	4.5	13.7	26.3	18.3	4.8	5.0	13.9	2.0	6.4	3.6	2.7	2.2	1.8		3.9	3.6	0.6	3.7	2.2	0.4	1.1	0.1	0.3	0.4
Belg	Belgium	1986-88	25.9	3.0	11.8	13.8	22.8	4.4	0.0	7.5	1.0	13.7	3.8	1.3	1.3	1.0	6.4		2.0	0.6	3.3	1.1	0.0	0.7	0.6	0.0	0.0
	Belgium	1995-97	22.9	2.9	14.1	14.8	23.8	4.0	4.7	8.2	1.7	15.5	5.0	2.4	2.2	1.8	5.8		1.4	1.0	5.3	2.1	0.4	1.8	0.1	0.2	0.2
Aus	Austria	1986-88	25.8	3.0	8.4	38.6	7.0	3.4	0.0	6.5	1.4	5.1	3.4	1.4	1.6	1.0	10.0	3.7		0.3	2.3	0.2	0.4	0.0	0.8	0.0	0.0
	Austria	1995-97	25.1	2.8	10.1	34.5	8.5	3.6	3.4	7.6	2.3	4.8	3.0	2.6	1.9	1.0	8.6	2.2		0.5	4.3	1.7	0.2	0.4	0.2	1.1	1.2
Ire	Ireland	1986-88	22.3	1.8	42.6	7.9	8.8	8.0	0.0	4.1	2.5	5.2	1.5	0.9	1.0	0.6	2.5	2.9	0.9		1.4	0.4	0.3	0.6	0.1	0.0	0.0
	Ireland	1995-97	21.8	2.5	40.6	12.3	10.2	5.3	2.7	7.4	2.8	8.1	3.2	2.9	2.3	1.5	4.2	5.0	1.5		4.8	1.6	0.2	1.4	0.0	0.3	0.2
Spn	Spain	1986-88	28.9	1.9	18.2	12.6	22.5	2.8	0.0	9.9	0.5	4.2	2.4	1.6	0.5	0.3	5.0	4.3	1.6	0.3		0.3	0.1	1.2	0.3	0.0	0.0
	Spain	1995-97	25.4	1.9	16.9	13.1	19.5	3.5	3.4	11.1	1.1	5.5	3.1	3.2	1.6	1.2	4.1	3.9	2.0	0.7		1.7	0.3	2.2	0.2	0.1	0.1
Grce	Greece	1986-88	42.0	1.1	22.5	14.5	14.9	5.8	0.0	4.4	0.5	2.3	3.6	1.0	0.5	0.5	7.4	3.7	0.4	0.3	0.9		0.1	0.2	2.0	0.0	0.0
	Greece	1995-97	31.2	2.5	23.5	23.3	21.0	4.3	5.4	13.8	0.7	5.1	3.9	5.6	4.1	4.3	10.2	6.6	3.3	1.0	7.0		0.4	3.9	0.9	0.7	1.0
Tur	Turkey	1986-88	32.6	1.6	19.8	19.8	3.9	6.5	0.0	2.6	1.0	3.1	2.1	1.3	0.8	0.0	2.6	0.5	2.3	0.5	0.5	0.3		0.0	0.5	0.0	0.0
	Turkey	1995-97	32.8	4.7	20.3	12.4	6.1	3.4	3.7	5.0	1.1	3.5	1.6	1.2	1.2	0.7	3.8	2.3	0.8	0.2	2.8	0.8		0.1	0.1	0.7	0.1
Por	Portugal	1986-88	24.2	0.4	29.3	11.6	20.8	4.8	0.0	3.4	0.0	4.8	1.8	2.5	0.7	2.9	2.7	5.4	0.2	0.9	6.6	0.4	0.0		0.0	0.0	0.0
	Portugal	1995-97	21.0	2.1	25.9	15.8	22.2	3.3	6.0	11.5	0.9	8.9	5.6	2.9	4.4	4.6	7.5	7.9	1.1	1.3	13.4	5.6	0.1		0.0	0.4	1.4
Yug	Yugoslavia	1986-88	34.8	1.3	8.4	25.1	6.7	4.0	0.0	6.5	0.5	2.5	5.6	0.7	0.6	1.7	4.9	1.9	1.4	0.1	0.8	1.9	0.2	0.0		0.0	0.0
	Yugoslavia	1995-97	26.1	4.6	10.8	13.1	5.9	4.1	5.3	5.7	2.5	2.3	2.3	0.5	1.8	0.7	2.7	2.0	2.0	0.0	4.8	4.8	0.4	0.2		1.8	1.6
Cro	Croatia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
	Croatia	1995-97	26.5	3.6	7.4	27.6	10.2	4.0	3.6	13.8	4.4	4.4	2.3	2.0	2.3	0.6	5.4	2.5	7.4	0.7	1.6	2.7	1.2	1.1	1.2		5.9
Slvn	Slovenia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Slovenia	1995-97	26.6	2.5	14.8	23.4	9.4	2.9	4.2	14.7	1.1	7.7	8.6	2.9	2.4	0.4	7.0	2.5	9.4	0.4	2.1	4.1	0.3	3.8	1.2	6.4	

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-61.
Patterns of international coauthorship in scientific and technical research for selected countries: 1986–97
(Percentages of internationally coauthored papers)

Code	Country	Year	Collaborating country (by country code)																							
			Pol	Cze	Cz-R	Slva	Hun	Bul	Rom	Indi	Chin	Taiw	SKor	HKng	Sing	Thai	Malay	Pak	Philip	Indo	NZ	USSR	Ukr	Bela	Uzb	Est	Lat
US	United States	1986-88	1.3	0.3	0.0	0.0	1.0	0.1	0.1	2.0	2.5	1.0	0.8	0.2	0.2	0.3	0.1	0.1	0.2	0.1	0.9	0.8	0.0	0.0	0.0	0.0	0.0
	United States	1995-97	1.8	0.0	0.7	0.3	1.1	0.2	0.3	1.7	2.5	1.9	2.3	0.8	0.3	0.3	0.1	0.1	0.1	0.2	1.0	0.0	0.4	0.1	0.0	0.1	0.0
Jap	Japan	1986-88	0.8	0.3	0.0	0.0	0.8	0.1	0.0	2.2	3.8	1.5	1.8	0.2	0.2	1.1	0.3	0.1	0.7	0.4	0.6	0.8	0.0	0.0	0.0	0.0	0.0
	Japan	1995-97	1.4	0.0	0.7	0.3	0.9	0.3	0.2	1.5	5.7	1.1	3.8	0.4	0.4	1.0	0.4	0.1	0.4	0.7	0.6	0.0	0.4	0.1	0.1	0.0	0.0
UK	United Kingdom	1986-88	1.4	0.4	0.0	0.0	0.6	0.2	0.1	2.1	1.0	0.2	0.1	0.5	0.4	0.5	0.4	0.2	0.1	0.2	1.3	0.6	0.0	0.0	0.0	0.0	0.0
	United Kingdom	1995-97	1.8	0.0	0.9	0.4	1.0	0.3	0.3	1.4	1.7	0.3	0.4	0.8	0.4	0.4	0.4	0.3	0.1	0.1	1.3	0.0	0.4	0.1	0.0	0.1	0.1
Ger	Germany	1986-88	3.9	2.2	0.0	0.0	2.3	1.0	0.2	1.9	1.0	0.1	0.1	0.0	0.0	0.1	0.0	0.2	0.1	0.0	0.3	5.0	0.0	0.0	0.0	0.0	0.0
	Germany	1995-97	4.0	0.0	1.9	1.0	1.9	0.9	0.7	1.5	2.2	0.2	0.5	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.5	0.0	1.1	0.4	0.1	0.2	0.2
Fra	France	1986-88	2.6	0.6	0.0	0.0	0.8	0.4	0.1	1.0	0.8	0.1	0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.3	1.9	0.0	0.0	0.0	0.0	0.0
	France	1995-97	3.7	0.0	1.7	0.8	1.3	0.6	1.0	1.2	1.5	0.2	0.3	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.3	0.0	0.7	0.2	0.0	0.1	0.1
Can	Canada	1986-88	1.4	0.4	0.0	0.0	0.7	0.1	0.0	1.9	1.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.8	0.4	0.0	0.0	0.0	0.0	0.0
	Canada	1995-97	1.3	0.0	0.7	0.3	0.6	0.2	0.2	1.3	2.1	0.4	0.5	1.0	0.3	0.2	0.1	0.1	0.1	0.1	1.1	0.0	0.2	0.1	0.0	0.1	0.1
Rus	Russia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Russia	1995-97	4.2	0.0	1.9	1.3	0.7	0.8	0.5	0.7	0.9	0.2	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	4.8	1.4	0.5	0.4	0.4
Ital	Italy	1986-88	2.7	0.8	0.0	0.0	1.2	0.4	0.4	1.5	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	2.4	0.0	0.0	0.0	0.0	0.0
	Italy	1995-97	3.3	0.0	1.5	0.9	1.5	0.7	1.2	1.2	2.0	0.1	0.5	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.3	0.0	0.6	0.3	0.0	0.1	0.0
Atral	Australia	1986-88	0.5	0.2	0.0	0.0	0.4	0.1	0.0	1.3	1.8	0.1	0.2	0.6	1.0	0.8	0.7	0.1	0.3	0.5	6.1	0.1	0.0	0.0	0.0	0.0	0.0
	Australia	1995-97	0.8	0.0	0.5	0.2	0.4	0.1	0.1	1.1	2.6	0.5	0.7	1.4	1.1	1.0	0.5	0.1	0.6	0.8	5.2	0.0	0.2	0.0	0.1	0.1	0.0
Neth	Netherlands	1986-88	2.5	0.8	0.0	0.0	1.0	0.1	0.1	0.7	0.6	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.4	0.3	1.1	0.0	0.0	0.0	0.0	0.0
	Netherlands	1995-97	2.3	0.0	1.3	0.4	1.5	0.2	0.7	1.1	1.5	0.1	0.2	0.2	0.0	0.2	0.0	0.1	0.2	0.5	0.5	0.0	0.9	0.1	0.0	0.1	0.1
Swe	Sweden	1986-88	2.8	0.9	0.0	0.0	1.2	0.3	0.2	0.9	0.7	0.1	0.0	0.1	0.2	0.1	0.0	0.3	0.0	0.0	0.3	1.8	0.0	0.0	0.0	0.0	0.0
	Sweden	1995-97	3.7	0.0	1.1	1.0	1.2	0.3	0.4	0.7	1.8	0.2	0.4	0.4	0.2	0.2	0.0	0.2	0.0	0.0	0.6	0.0	0.8	0.2	0.1	1.0	0.6
Den	Denmark	1986-88	1.7	0.9	0.0	0.0	0.3	0.2	0.0	0.8	0.7	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.4	1.9	0.0	0.0	0.0	0.0	0.0
	Denmark	1995-97	2.6	0.0	0.9	0.4	0.7	0.2	0.2	0.8	1.8	0.1	0.2	0.2	0.2	0.3	0.0	0.0	0.1	0.1	0.9	0.0	0.5	0.2	0.1	0.2	0.4
Fin	Finland	1986-88	3.0	1.9	0.0	0.0	2.8	0.2	0.1	0.8	0.5	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.6	4.7	0.0	0.0	0.0	0.0	0.0
	Finland	1995-97	3.8	0.0	2.3	2.0	3.0	0.3	0.8	0.9	1.3	0.2	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.5	0.0	0.5	0.2	0.0	2.6	0.4
Nor	Norway	1986-88	1.8	0.5	0.0	0.0	1.1	0.2	0.1	0.9	0.9	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.6	1.1	0.0	0.0	0.0	0.0	0.0
	Norway	1995-97	3.5	0.0	2.5	2.1	0.9	0.1	0.3	0.5	0.9	0.1	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.5	0.1	0.0	0.3	0.0
Swit	Switzerland	1986-88	2.0	0.4	0.0	0.0	1.2	0.2	0.1	1.1	0.7	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.4	1.9	0.0	0.0	0.0	0.0	0.0
	Switzerland	1995-97	2.7	0.0	1.6	0.9	1.7	0.3	0.6	1.1	1.6	0.1	0.3	0.1	0.2	0.2	0.0	0.1	0.1	0.1	0.4	0.0	0.3	0.1	0.0	0.1	0.0
Belg	Belgium	1986-88	2.1	0.9	0.0	0.0	1.1	0.1	0.1	1.5	0.6	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.2	2.2	0.0	0.0	0.0	0.0	0.0
	Belgium	1995-97	3.4	0.0	2.0	1.5	1.5	0.6	0.8	0.7	1.1	0.1	0.3	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.4	0.0	0.4	0.1	0.0	0.1	0.0
Aus	Austria	1986-88	2.7	1.9	0.0	0.0	4.5	1.1	0.2	2.2	0.5	0.0	0.0	0.0	0.0	0.5	0.0	0.1	0.0	0.0	0.3	3.5	0.0	0.0	0.0	0.0	0.0
	Austria	1995-97	3.7	0.0	3.3	3.1	2.9	0.6	0.3	0.5	2.3	0.0	0.3	0.2	0.1	0.4	0.1	0.0	0.0	0.1	0.6	0.0	1.3	0.3	0.0	0.0	0.0
Ire	Ireland	1986-88	0.8	0.3	0.0	0.0	0.3	0.0	0.0	0.6	1.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0
	Ireland	1995-97	0.8	0.0	0.4	0.1	1.1	0.2	0.5	0.3	0.7	0.1	0.4	0.3	0.3	0.2	0.1	0.0	0.1	0.1	0.7	0.0	0.0	0.1	0.0	0.0	0.0
Spn	Spain	1986-88	1.1	0.4	0.0	0.0	1.0	0.1	0.1	1.5	0.3	0.0	0.1	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.2	1.1	0.0	0.0	0.0	0.0	0.0
	Spain	1995-97	2.1	0.0	1.2	0.4	0.6	0.7	0.4	0.7	1.2	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.5	0.1	0.0	0.1	0.0
Grce	Greece	1986-88	2.3	0.3	0.0	0.0	0.7	1.9	0.1	0.3	0.6	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.1	0.3	1.0	0.0	0.0	0.0	0.0	0.0
	Greece	1995-97	3.4	0.0	3.2	2.9	1.2	1.5	1.2	0.4	3.3	0.2	0.2	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.0	0.7	0.0	0.0	0.0	0.0
Tur	Turkey	1986-88	0.5	0.8	0.0	0.0	0.0	0.0	0.0	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Turkey	1995-97	1.2	0.0	0.3	0.1	0.8	1.2	0.2	0.1	0.6	0.2	0.8	0.4	0.1	0.1	0.3	1.2	0.1	0.0	0.3	0.0	2.4	0.1	0.5	0.0	0.0
Por	Portugal	1986-88	0.4	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0
	Portugal	1995-97	3.1	0.0	3.5	2.5	0.7	0.1	0.8	0.7	1.1	0.3	0.1	0.3	0.1	0.2	0.1	0.1	0.0	0.0	0.3	0.0	0.3	0.2	0.0	0.1	0.0
Yug	Yugoslavia	1986-88	2.9	2.4	0.0	0.0	3.9	1.2	0.4	0.3	0.3	0.2	0.1	0.0	0.2	0.2	0.0	0.2	0.1	0.0	0.3	10.8	0.0	0.0	0.0	0.0	0.0
	Yugoslavia	1995-97	2.3	0.0	2.7	1.8	6.9	1.4	0.4	0.4	1.1	0.4	0.2	0.7	0.0	0.7	0.2	0.0	0.0	0.7	0.2	0.0	1.2	0.0	0.2	0.4	0.0
Cro	Croatia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Croatia	1995-97	4.3	0.0	1.5	0.5	6.6	0.5	3.3	0.5	0.4	0.0	0.2	0.1	0.7	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.9	0.1	0.0	0.0	0.4
Slvn	Slovenia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Slovenia	1995-97	3.6	0.0	2.4	1.6	4.4	0.3	0.3	0.7	1.5	0.0	0.1	0.8	0.1	0.8	0.0	0.0	0.1	0.5	0.5	0.0	0.9	0.1	0.0	0.3	0.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-61.
Patterns of international coauthorship in scientific and technical research for selected countries: 1986–97
(Percentages of internationally coauthored papers)

Code	Country	Year	Collaborating country (by country code)																			
			Lith	Arm	Bra	Arg	Mex	Chil	Vene	Col	Cub	Isr	Saud	Irn	Jor	Kuw	SAfr	Egy	Nig	Ken	Moroc	Alg	Tun
US	United States	1986-88	0.0	0.0	1.3	0.5	1.0	0.6	0.3	0.2	0.0	6.1	0.3	0.1	0.1	0.1	0.8	0.6	0.3	0.3	0.1	0.0	0.0
	United States	1995-97	0.1	0.1	2.2	0.8	1.3	0.6	0.3	0.3	0.0	4.1	0.2	0.1	0.1	0.1	0.7	0.5	0.1	0.2	0.1	0.0	0.0
Jap	Japan	1986-88	0.0	0.0	0.4	0.1	0.2	0.2	0.1	0.0	0.0	0.8	0.0	0.0	0.0	0.1	0.4	0.2	0.1	0.2	0.0	0.0	0.0
	Japan	1995-97	0.0	0.0	0.9	0.2	0.2	0.1	0.1	0.1	0.0	1.0	0.1	0.2	0.0	0.0	0.3	0.5	0.1	0.1	0.1	0.0	0.0
UK	United Kingdom	1986-88	0.0	0.0	0.9	0.2	0.4	0.2	0.3	0.1	0.0	1.9	0.5	0.2	0.2	0.3	1.1	0.6	0.7	0.5	0.0	0.1	0.0
	United Kingdom	1995-97	0.0	0.0	1.5	0.4	0.6	0.3	0.2	0.1	0.0	1.5	0.3	0.2	0.1	0.1	1.1	0.2	0.3	0.6	0.1	0.1	0.0
Ger	Germany	1986-88	0.0	0.0	1.0	0.3	0.3	0.4	0.0	0.1	0.2	2.5	0.0	0.0	0.1	0.0	0.6	0.6	0.2	0.1	0.0	0.0	0.0
	Germany	1995-97	0.2	0.1	1.3	0.5	0.4	0.4	0.1	0.1	0.1	2.5	0.0	0.1	0.1	0.0	0.7	0.4	0.1	0.1	0.1	0.0	0.0
Fra	France	1986-88	0.0	0.0	1.6	0.6	0.6	0.4	0.2	0.1	0.0	1.8	0.0	0.0	0.0	0.0	0.2	0.4	0.1	0.1	1.3	1.0	1.2
	France	1995-97	0.1	0.1	2.2	0.7	0.8	0.5	0.3	0.2	0.1	2.0	0.1	0.0	0.0	0.0	0.4	0.2	0.1	0.1	2.2	1.1	0.8
Can	Canada	1986-88	0.0	0.0	0.9	0.1	0.5	0.3	0.1	0.1	0.0	2.2	0.2	0.1	0.0	0.1	0.5	0.2	0.3	0.3	0.1	0.0	0.0
	Canada	1995-97	0.0	0.0	1.4	0.4	0.8	0.3	0.1	0.1	0.1	1.9	0.2	0.1	0.0	0.1	0.5	0.2	0.1	0.3	0.2	0.0	0.0
Rus	Russia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Russia	1995-97	0.3	0.7	1.5	0.1	1.0	0.1	0.1	0.1	0.1	2.1	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.1	0.0	0.0
Ital	Italy	1986-88	0.0	0.0	1.1	0.6	0.2	0.4	0.2	0.0	0.3	1.1	0.1	0.0	0.0	0.0	0.5	0.3	0.1	0.1	0.0	0.1	0.0
	Italy	1995-97	0.2	0.1	2.2	0.6	0.5	0.3	0.2	0.1	0.1	2.1	0.0	0.0	0.0	0.0	0.3	0.3	0.2	0.1	0.2	0.1	0.0
Atral	Australia	1986-88	0.0	0.0	0.2	0.2	0.1	0.2	0.0	0.1	0.0	1.0	0.1	0.1	0.1	0.0	1.6	0.1	0.1	0.2	0.0	0.1	0.0
	Australia	1995-97	0.1	0.1	0.8	0.3	0.4	0.3	0.1	0.1	0.0	1.8	0.1	0.4	0.0	0.0	1.6	0.1	0.1	0.1	0.0	0.0	0.0
Neth	Netherlands	1986-88	0.0	0.0	0.4	0.2	0.2	0.2	0.0	0.0	0.1	1.6	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.2	0.0	0.0	0.0
	Netherlands	1995-97	0.1	0.1	0.8	0.4	0.3	0.3	0.1	0.1	0.0	1.5	0.1	0.0	0.0	0.0	0.4	0.2	0.1	0.2	0.0	0.0	0.0
Swe	Sweden	1986-88	0.0	0.0	0.3	0.4	0.3	0.1	0.1	0.1	0.1	1.5	0.1	0.0	0.0	0.3	0.3	0.2	0.2	0.1	0.0	0.0	0.0
	Sweden	1995-97	0.7	0.1	0.9	0.5	0.2	0.4	0.1	0.0	0.1	0.8	0.1	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.0	0.0	0.0
Den	Denmark	1986-88	0.0	0.0	0.4	0.1	0.1	0.1	0.0	0.0	0.0	1.5	0.1	0.1	0.1	0.0	0.2	0.2	0.2	0.3	0.0	0.0	0.0
	Denmark	1995-97	0.3	0.1	0.5	0.5	0.3	0.2	0.0	0.0	0.1	1.2	0.1	0.0	0.0	0.0	0.4	0.1	0.1	0.4	0.0	0.0	0.0
Fin	Finland	1986-88	0.0	0.0	1.1	0.2	0.2	0.3	0.1	0.0	0.1	0.6	0.1	0.0	0.0	0.0	0.1	0.1	0.3	0.1	0.0	0.0	0.0
	Finland	1995-97	0.4	0.0	1.9	0.4	0.3	0.3	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.1	0.3	0.5	0.1	0.0	0.0	0.0	0.0
Nor	Norway	1986-88	0.0	0.0	0.3	0.1	0.0	0.2	0.0	0.2	0.0	1.2	0.1	0.0	0.0	0.1	0.2	0.1	0.0	0.4	0.0	0.0	0.0
	Norway	1995-97	0.6	0.0	2.4	0.1	0.2	0.1	0.0	0.1	0.0	1.2	0.0	0.1	0.0	0.1	0.3	0.3	0.0	0.1	0.0	0.0	0.0
Swit	Switzerland	1986-88	0.0	0.0	0.5	0.2	0.2	0.2	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.4	0.1	0.1	0.2	0.1	0.0	0.1
	Switzerland	1995-97	0.0	0.1	1.4	0.3	0.4	0.2	0.1	0.2	0.1	2.5	0.0	0.1	0.0	0.0	0.5	0.2	0.1	0.2	0.2	0.0	0.1
Belg	Belgium	1986-88	0.0	0.0	1.0	0.3	0.2	0.7	0.1	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.7	0.5	0.1	0.4	0.0	0.2	0.1
	Belgium	1995-97	0.1	0.2	2.0	0.3	0.4	0.5	0.0	0.1	0.1	1.3	0.1	0.1	0.0	0.0	0.6	0.3	0.1	0.4	0.4	0.2	0.1
Aus	Austria	1986-88	0.0	0.0	0.4	0.1	0.1	0.1	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.4	0.3	0.1	0.0	0.0	0.0	0.0
	Austria	1995-97	0.1	0.0	0.8	0.4	0.2	0.2	0.1	0.0	0.1	1.2	0.1	0.1	0.0	0.3	0.9	0.5	0.1	0.0	0.0	0.0	0.0
Ire	Ireland	1986-88	0.0	0.0	1.1	0.0	0.1	0.1	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.5	0.5	0.6	0.1	0.1	0.1	0.0	0.0
	Ireland	1995-97	0.0	0.1	0.8	0.3	0.4	0.1	0.1	0.0	0.0	0.7	0.1	0.0	0.1	0.1	0.6	0.1	0.1	0.5	0.0	0.0	0.0
Spn	Spain	1986-88	0.0	0.0	0.9	0.9	2.0	2.0	0.8	0.1	0.0	0.9	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.0	0.0
	Spain	1995-97	0.1	0.2	2.1	3.0	2.4	1.3	0.7	0.5	0.9	1.3	0.0	0.0	0.0	0.0	0.5	0.2	0.0	0.1	0.4	0.1	0.1
Grce	Greece	1986-88	0.0	0.0	0.2	0.0	0.3	0.0	0.1	0.0	0.0	0.8	0.1	0.0	0.1	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.1
	Greece	1995-97	0.1	0.2	2.5	0.2	0.3	0.2	0.0	0.0	0.0	1.0	0.1	0.1	0.1	0.0	0.7	0.1	0.0	0.0	0.0	0.1	0.0
Tur	Turkey	1986-88	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.5	2.3	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
	Turkey	1995-97	0.0	0.0	0.5	0.3	0.5	0.1	0.0	0.0	0.0	3.0	1.0	0.1	0.1	0.1	0.5	0.5	0.2	0.1	0.1	0.2	0.1
Por	Portugal	1986-88	0.0	0.0	1.8	0.2	0.4	0.0	0.4	0.2	0.2	1.1	0.0	0.0	0.0	0.0	0.4	0.0	0.2	0.0	0.0	0.0	0.2
	Portugal	1995-97	0.0	0.1	6.5	0.1	0.0	0.3	0.2	0.0	0.0	0.9	0.1	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.1	0.1	0.0
Yug	Yugoslavia	1986-88	0.0	0.0	0.2	0.2	0.3	0.1	0.0	0.0	0.1	0.6	0.0	0.0	0.0	0.1	0.1	0.4	0.0	0.1	0.2	0.1	0.0
	Yugoslavia	1995-97	0.0	0.0	1.2	0.0	0.7	0.7	0.0	0.7	0.0	1.4	0.0	0.0	0.0	0.4	0.5	0.0	0.0	0.9	0.2	0.0	0.2
Cro	Croatia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Croatia	1995-97	0.0	0.0	0.7	0.4	0.0	0.0	0.0	0.0	0.0	2.1	0.1	0.1	0.0	0.0	0.5	0.2	0.0	0.0	0.4	0.1	0.0
Slvn	Slovenia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Slovenia	1995-97	0.1	0.0	1.1	0.9	0.8	0.7	0.1	0.5	0.1	2.1	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.5	0.0	0.1	0.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-61.
Patterns of international coauthorship in scientific and technical research for selected countries: 1986–97
(Percentages of internationally coauthored papers)

Code	Country	Year	Collaborating country (by country code)																							
			US	Jap	UK	Ger	Fra	Can	Rus	Ital	Atral	Neth	Swe	Den	Fin	Nor	Swit	Belg	Aus	Ire	Spn	Grce	Tur	Por	Yug	Cro	Slvn
Pol	Poland	1986-88	22.6	1.9	9.1	25.1	12.5	5.9	0.0	7.3	0.8	4.7	5.4	1.7	1.9	1.0	4.4	2.6	1.9	0.2	1.1	0.8	0.1	0.1	1.2	0.0	0.0
	Poland	1995-97	24.3	4.0	9.9	22.4	16.5	3.9	8.8	8.9	1.2	4.3	6.0	2.3	2.5	1.8	4.7	4.0	2.7	0.2	3.4	1.3	0.2	0.8	0.2	0.5	0.3
Cze	Czechoslovakia	1986-88	9.1	1.4	4.8	23.8	5.4	3.1	0.0	3.7	0.5	2.5	3.0	1.5	2.0	0.5	1.5	1.9	2.2	0.1	0.8	0.2	0.2	0.0	1.7	0.0	0.0
	Czechoslovakia	1995-97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cz-R	Czech Republic	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Czech Republic	1995-97	20.4	4.1	10.0	23.0	15.6	4.1	8.4	8.6	1.6	5.3	3.8	1.7	3.1	2.7	5.9	5.0	5.1	0.2	3.9	2.5	0.1	2.0	0.4	0.3	0.5
Slva	Slovakia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Slovakia	1995-97	20.0	3.1	10.0	25.8	15.8	3.9	11.4	11.2	1.3	3.4	6.8	1.8	5.9	4.8	6.7	7.5	9.9	0.1	2.6	4.9	0.1	2.9	0.6	0.2	0.7
Hun	Hungary	1986-88	26.3	3.0	6.0	22.5	5.7	4.5	0.0	5.1	1.0	3.0	3.6	0.5	2.6	1.0	3.8	2.2	4.7	0.1	1.5	0.4	0.0	0.1	2.4	0.0	0.0
	Hungary	1995-97	30.8	5.6	12.1	23.0	12.3	4.0	3.2	8.5	1.2	6.1	4.1	1.4	4.3	1.0	6.6	3.7	4.6	0.6	2.1	1.0	0.3	0.4	1.1	1.5	0.9
Bul	Bulgaria	1986-88	7.5	1.3	5.0	24.1	7.2	1.7	0.0	4.4	0.4	0.8	1.9	0.6	0.5	0.5	1.7	0.5	2.8	0.0	0.2	2.8	0.0	0.0	1.8	0.0	0.0
	Bulgaria	1995-97	14.5	4.9	7.9	28.0	14.3	2.6	8.8	10.0	1.2	2.3	2.6	0.8	1.1	0.2	2.6	3.7	2.2	0.3	6.0	3.1	1.2	0.2	0.6	0.3	0.1
Rom	Romania	1986-88	21.9	1.0	9.7	14.6	5.9	0.3	0.0	11.5	0.7	2.1	3.5	0.0	0.7	0.7	1.4	1.4	1.4	0.0	1.0	0.3	0.0	0.0	1.7	0.0	0.0
	Romania	1995-97	21.5	3.3	9.3	22.0	25.1	3.7	6.2	18.4	0.9	7.2	3.5	1.0	3.0	0.8	5.7	5.5	1.1	0.6	3.7	2.7	0.2	1.1	0.1	1.9	0.1
Indi	India	1986-88	38.1	6.4	15.3	13.7	5.5	9.3	0.0	4.6	2.6	1.6	1.9	0.9	0.5	0.6	2.7	2.1	1.8	0.2	1.7	0.1	0.1	0.0	0.1	0.0	0.0
	India	1995-97	39.5	7.4	12.7	14.3	9.1	6.7	2.5	5.9	2.9	3.7	2.0	1.3	1.0	0.4	3.4	1.5	0.6	0.1	1.9	0.3	0.0	0.3	0.0	0.1	0.1
Chin	China	1986-88	51.2	11.8	7.8	7.5	4.9	7.0	0.0	3.7	3.7	1.4	1.7	0.8	0.4	0.6	1.9	1.0	0.4	0.3	0.3	0.3	0.0	0.0	0.2	0.0	0.0
	China	1995-97	32.5	15.3	9.0	12.4	6.4	6.1	1.8	5.2	3.7	2.8	2.8	1.6	0.9	0.5	2.8	1.3	1.6	0.2	1.9	1.2	0.1	0.3	0.1	0.0	0.1
Taiw	Taiwan	1986-88	71.4	16.2	4.2	2.4	1.2	4.2	0.0	0.4	0.7	0.1	0.5	0.1	0.0	0.1	0.1	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.3	0.0	0.0
	Taiwan	1995-97	70.4	8.4	4.6	3.1	2.6	3.6	1.3	1.1	1.9	0.6	0.9	0.1	0.3	0.1	0.6	0.3	0.0	0.1	0.6	0.2	0.1	0.2	0.1	0.0	0.0
SKor	South Korea	1986-88	66.2	22.0	2.8	3.9	3.6	4.4	0.0	0.6	1.5	0.7	0.1	0.1	0.1	0.0	0.1	0.3	0.1	0.0	0.4	0.0	0.0	0.0	0.1	0.0	0.0
	South Korea	1995-97	62.1	21.1	4.7	5.2	2.4	3.3	4.1	2.7	2.0	0.8	1.2	0.4	0.4	0.3	1.0	0.6	0.5	0.2	0.7	0.2	0.3	0.1	0.0	0.1	0.0
HKng	Hong Kong	1986-88	31.2	5.7	30.3	2.1	2.1	7.2	0.0	1.2	10.2	0.9	1.2	0.3	0.0	0.0	1.5	0.0	0.0	0.3	0.0	0.6	0.0	0.0	0.0	0.0	0.0
	Hong Kong	1995-97	30.3	3.1	12.6	2.4	2.0	8.8	0.4	0.8	6.0	1.2	1.6	0.5	0.3	0.2	0.7	0.3	0.4	0.2	0.3	0.0	0.2	0.2	0.1	0.0	0.2
Sing	Singapore	1986-88	26.4	6.3	25.8	0.9	0.6	7.5	0.0	0.3	16.4	0.6	3.5	0.0	0.0	0.9	1.3	0.6	0.0	0.0	1.3	0.0	0.0	0.0	0.9	0.0	0.0
	Singapore	1995-97	30.9	7.1	16.2	3.0	1.9	5.7	0.4	0.7	11.4	0.4	2.4	1.0	1.2	0.3	2.2	0.6	0.6	0.5	0.4	0.0	0.1	0.3	0.0	0.5	0.1
Thai	Thailand	1986-88	34.9	17.6	21.9	5.7	2.2	3.7	0.0	0.4	8.9	1.0	1.8	1.0	0.2	0.4	2.8	0.6	2.2	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0
	Thailand	1995-97	33.9	21.9	16.2	4.6	4.9	5.1	0.5	1.3	11.3	2.4	2.9	2.3	1.1	0.2	3.2	1.2	2.4	0.4	0.4	0.0	0.2	0.5	0.4	0.1	0.6
Malay	Malaysia	1986-88	22.9	11.2	32.9	3.6	4.8	6.8	0.0	0.8	14.5	0.4	0.8	0.4	0.4	0.8	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Malaysia	1995-97	13.7	13.9	26.7	3.8	3.2	3.4	0.0	0.7	10.5	1.3	0.7	0.5	1.1	0.4	0.9	1.4	0.7	0.2	0.4	0.4	0.9	0.5	0.2	0.2	0.0
Pak	Pakistan	1986-88	32.1	2.1	15.6	19.8	0.0	5.1	0.0	3.4	2.1	1.7	6.8	0.4	0.0	0.0	2.5	1.7	1.3	0.0	2.5	0.4	2.1	0.0	0.8	0.0	0.0
	Pakistan	1995-97	33.6	2.9	26.2	14.3	2.1	3.1	0.7	3.6	2.1	3.8	5.5	0.2	0.7	0.5	1.9	1.0	0.5	0.0	0.7	0.7	4.0	0.5	0.0	0.0	0.0
Philip	Philippines	1986-88	47.0	23.9	6.1	4.5	2.0	3.6	0.0	0.4	6.1	1.2	1.2	1.2	0.4	0.0	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0
	Philippines	1995-97	33.0	18.5	7.9	3.7	4.0	4.8	0.7	0.4	14.3	7.5	0.0	1.1	0.9	0.2	1.8	2.9	0.0	0.2	1.5	0.0	0.2	0.0	0.0	0.0	0.2
Indo	Indonesia	1986-88	33.0	13.5	15.8	0.9	10.2	3.7	0.0	0.5	11.6	10.2	0.9	0.5	0.5	0.0	0.9	1.9	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
	Indonesia	1995-97	30.0	23.3	8.6	5.7	6.3	2.9	0.6	0.5	14.7	12.0	1.0	1.6	1.1	0.3	1.9	1.9	0.5	0.2	0.2	0.0	0.0	0.0	0.6	0.2	0.6
NZ	New Zealand	1986-88	37.7	3.7	19.5	4.7	3.2	8.4	0.0	1.0	23.8	1.3	1.4	1.0	0.9	0.8	1.8	0.5	0.5	0.1	0.4	0.2	0.0	0.1	0.3	0.0	0.0
	New Zealand	1995-97	36.7	5.0	19.3	8.0	4.5	9.2	0.9	2.2	22.1	2.8	2.9	2.3	0.9	0.8	2.1	1.2	1.2	0.4	1.2	0.3	0.2	0.3	0.0	0.0	0.1
USSR	USSR	1986-88	12.1	1.9	3.5	30.6	8.7	1.6	0.0	6.0	0.2	2.0	3.3	1.8	2.8	0.6	3.9	2.7	2.3	0.1	1.0	0.4	0.0	0.0	4.1	0.0	0.0
	USSR	1995-97	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ukr	Ukraine	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Ukraine	1995-97	12.7	3.1	6.2	15.9	8.1	1.5	26.3	4.4	0.6	4.4	3.1	1.2	0.9	0.6	1.5	1.3	2.4	0.0	2.2	0.7	1.2	0.2	0.2	0.2	0.2
Bela	Belarus	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Belarus	1995-97	9.0	3.4	6.5	21.1	9.4	2.7	29.6	8.2	0.5	2.0	2.4	1.5	1.0	0.8	1.9	1.5	2.2	0.3	1.8	0.1	0.1	0.5	0.0	0.1	0.1
Uzb	Uzbekistan	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Uzbekistan	1995-97	17.3	13.1	3.0	11.4	4.6	3.4	36.7	3.0	6.3	0.4	5.5	1.7	0.0	0.0	0.0	1.3	0.0	0.0	2.5	0.0	3.4	0.0	0.4	0.0	0.0
Est	Estonia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Estonia	1995-97	15.5	1.3	5.7	17.5	7.4	3.0	10.9	4.0	1.1	3.2	23.0	2.6	25.3	2.1	2.3	0.9	0.0	0.0	2.3	0.0	0.0	0.6	0.4	0.0	0.4
Lat	Latvia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Latvia	1995-97	10.6	2.3	9.1	23.8	8.8	4.7	17.0	2.9	0.6	2.3	22.3	7.3	6.5	0.3	1.5	1.2	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.9	0.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-61.
Patterns of international coauthorship in scientific and technical research for selected countries: 1986–97
(Percentages of internationally coauthored papers)

Code	Country	Year	Collaborating country (by country code)																							
			Pol	Cze	Cz-R	Slva	Hun	Bul	Rom	Indi	Chin	Taiw	SKor	HKng	Sing	Thai	Malay	Pak	Philip	Indo	NZ	USSR	Ukr	Bela	Uzb	Est	Lat
Pol	Poland	1986-88		3.9	0.0	0.0	1.9	1.3	0.3	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	7.0	0.0	0.0	0.0	0.0	0.0
	Poland	1995-97		0.0	2.2	2.3	1.5	0.6	0.6	0.5	0.5	0.1	0.8	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.0	4.9	1.1	0.1	0.2	0.1
Cze	Czechoslovakia	1986-88	6.7		0.0	0.0	6.0	3.7	0.8	0.8	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.1	28.1	0.0	0.0	0.0	0.0	0.0
	Czechoslovakia	1995-97	0.0		75.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cz-R	Czech Republic	1986-88	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Czech Republic	1995-97	4.7	0.1		8.9	1.5	0.7	0.5	0.5	0.4	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.3	0.0	1.4	0.6	0.0	0.3	0.2
Slva	Slovakia	1986-88	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Slovakia	1995-97	9.9	0.1	18.6		1.5	0.4	0.6	1.2	1.1	0.2	0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.0	2.8	0.1	0.7	0.2	0.0
Hun	Hungary	1986-88	2.9	5.3	0.0	0.0		1.6	0.6	1.5	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.1	0.0	0.0	11.4	0.0	0.0	0.0	0.0	0.0
	Hungary	1995-97	3.1	0.0	1.6	0.7		0.7	2.9	2.0	2.1	0.2	0.2	0.2	0.1	0.4	0.1	0.0	0.0	0.2	0.3	0.0	0.7	0.1	0.0	0.2	0.1
Bul	Bulgaria	1986-88	5.1	8.4	0.0	0.0	4.1		1.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0
	Bulgaria	1995-97	3.0	0.0	1.7	0.5	1.8		1.5	0.6	0.6	0.1	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	1.0	0.7	0.3	0.1	0.3
Rom	Romania	1986-88	3.1	4.9	0.0	0.0	4.5	3.1		1.4	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.1	0.0	0.0	0.0	0.0	0.0
	Romania	1995-97	3.4	0.0	1.4	0.7	7.5	1.6		4.3	5.6	0.2	0.4	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.3	0.0	0.4	0.3	0.4	0.1	0.1
Indi	India	1986-88	0.5	0.5	0.0	0.0	1.1	0.1	0.1		0.4	0.1	0.1	0.1	0.4	0.5	0.1	0.3	0.3	0.1	0.3	2.1	0.0	0.0	0.0	0.0	0.0
	India	1995-97	0.9	0.0	0.4	0.5	1.6	0.2	1.3		2.5	0.6	1.3	0.7	0.8	0.3	0.8	0.2	0.4	0.3	0.5	0.0	0.1	0.0	0.3	0.0	0.0
Chin	China	1986-88	0.5	0.2	0.0	0.0	0.1	0.0	0.2	0.4		0.6	0.4	1.7	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.0	0.0	0.0	0.0	0.0
	China	1995-97	0.5	0.0	0.2	0.3	0.9	0.1	1.0	1.4		1.4	2.0	11.6	1.7	0.3	0.8	0.1	0.3	0.2	0.4	0.0	0.2	0.1	0.2	0.0	0.0
Taiw	Taiwan	1986-88	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	2.0		0.7	0.0	0.9	0.0	0.0	0.0	0.5	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
	Taiwan	1995-97	0.2	0.0	0.2	0.1	0.2	0.0	0.1	1.0	4.1		1.6	3.4	1.5	0.5	0.2	0.0	0.4	0.2	0.3	0.0	0.4	0.1	0.1	0.0	0.0
SKor	South Korea	1986-88	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.4	1.6	0.7		0.1	0.1	0.6	1.2	0.0	0.3	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	South Korea	1995-97	1.6	0.0	0.1	0.1	0.2	0.1	0.1	1.5	4.0	1.2		0.5	0.2	0.3	0.2	0.0	0.2	0.2	0.6	0.0	0.4	0.1	0.2	0.0	0.0
HKng	Hong Kong	1986-88	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.9	13.5	0.0	0.3		0.9	0.3	2.4	0.0	0.3	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0
	Hong Kong	1995-97	0.3	0.0	0.1	0.0	0.2	0.1	0.1	1.1	34.3	3.6	0.7		2.0	0.4	0.3	0.3	0.3	0.3	1.1	0.0	0.1	0.2	0.0	0.0	0.0
Sing	Singapore	1986-88	0.0	0.3	0.0	0.0	0.3	0.0	0.0	3.5	1.9	2.2	0.3	0.9		1.3	2.5	0.0	0.3	0.3	1.9	0.9	0.0	0.0	0.0	0.0	0.0
	Singapore	1995-97	0.2	0.0	0.0	0.2	0.4	0.1	0.1	3.2	12.1	3.7	0.8	4.8		1.6	2.3	0.2	0.5	0.5	1.7	0.0	0.2	0.0	0.0	0.0	0.1
Thai	Thailand	1986-88	0.0	0.2	0.0	0.0	0.8	0.0	0.0	2.6	0.6	0.0	0.8	0.2	0.8		1.2	0.6	2.0	0.6	0.6	0.2	0.0	0.0	0.0	0.0	0.0
	Thailand	1995-97	0.1	0.0	0.1	0.2	1.5	0.0	0.3	1.3	2.4	1.3	1.1	1.2	1.8		1.6	0.4	2.5	3.4	1.0	0.0	0.0	0.0	0.0	0.2	0.0
Malay	Malaysia	1986-88	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.8	0.0	3.2	3.2	3.2	2.4		0.0	0.8	1.6	1.2	0.0	0.0	0.0	0.0	0.0	0.0
	Malaysia	1995-97	0.2	0.0	0.4	0.0	0.4	0.2	0.0	6.9	11.6	1.1	1.1	1.6	4.7	2.9		0.4	1.8	2.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Pak	Pakistan	1986-88	0.4	0.4	0.0	0.0	1.3	0.0	0.0	3.8	0.8	0.0	0.0	0.0	0.0	1.3	0.0		0.8	0.4	1.7	1.3	0.0	0.0	0.0	0.0	0.0
	Pakistan	1995-97	1.4	0.0	0.0	0.0	0.0	0.0	0.0	1.9	1.9	0.0	0.0	2.1	0.5	1.0	0.5		0.2	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Philip	Philippines	1986-88	0.4	0.0	0.0	0.0	0.8	0.0	0.0	2.8	2.0	1.6	0.8	0.4	0.4	4.0	0.8	0.8		1.2	2.8	0.0	0.0	0.0	0.0	0.0	0.0
	Philippines	1995-97	0.0	0.0	0.2	0.0	0.2	0.0	0.0	4.0	5.9	2.4	1.8	1.8	1.3	5.3	2.2	0.2		4.8	1.3	0.0	0.0	0.0	0.0	0.0	0.0
Indo	Indonesia	1986-88	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.9	0.9	2.3	0.9	0.5	1.4	1.9	0.5	1.4		0.9	0.0	0.0	0.0	0.0	0.0	0.0
	Indonesia	1995-97	0.5	0.0	0.3	0.0	1.0	0.0	0.0	2.1	2.9	1.0	1.0	1.1	1.0	5.2	2.5	0.5	3.5		2.9	0.0	0.0	0.0	0.0	0.0	0.0
NZ	New Zealand	1986-88	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.7	0.7	0.1	0.1	0.1	0.4	0.2	0.2	0.3	0.5	0.1		0.0	0.0	0.0	0.0	0.0	0.0
	New Zealand	1995-97	0.8	0.0	0.4	0.1	0.4	0.1	0.1	0.8	1.0	0.3	0.8	1.1	0.7	0.4	0.1	0.1	0.2	0.7		0.0	0.0	0.0	0.0	0.0	0.0
USSR	USSR	1986-88	6.7	15.5	0.0	0.0	7.1	8.2	1.7	1.7	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	USSR	1995-97	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA
Ukr	Ukraine	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA
	Ukraine	1995-97	12.7	0.0	1.7	1.7	0.8	0.5	0.2	0.2	0.5	0.3	0.5	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0		1.4	1.2	0.3	0.2
Bela	Belarus	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA
	Belarus	1995-97	10.6	0.0	2.9	0.1	0.6	1.3	0.5	0.3	0.5	0.3	0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3		0.3	0.6	0.6
Uzb	Uzbekistan	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA
	Uzbekistan	1995-97	2.5	0.0	0.4	5.5	0.0	1.7	2.1	5.1	6.3	1.3	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.6	0.8		0.0	0.0
Est	Estonia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
	Estonia	1995-97	2.5	0.0	1.9	0.6	1.3	0.4	0.2	0.2	0.6	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.2	1.5	0.9	0.0		1.9
Lat	Latvia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	Latvia	1995-97	2.6	0.0	2.1	0.0	1.2	1.5	0.3	0.3	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	1.5	0.0	2.9	

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-61.
Patterns of international coauthorship in scientific and technical research for selected countries: 1986–97
(Percentages of internationally coauthored papers)

			Collaborating country (by country code)																			
Code	Country	Year	Lith	Arm	Bra	Arg	Mex	Chil	Vene	Col	Cub	Isr	Saud	Irn	Jor	Kuw	SAfr	Egy	Nig	Ken	Moroc	Alg	Tun
Pol	Poland	1986-88	0.0	0.0	1.1	0.1	0.6	0.0	0.1	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.2	0.8	0.1	0.0	0.0	0.1	0.0
	Poland	1995-97	0.3	0.2	1.5	0.1	0.9	0.1	0.1	0.1	0.0	1.1	0.0	0.0	0.0	0.1	0.6	0.2	0.1	0.0	0.1	0.0	0.0
Cze	Czechoslovakia	1986-88	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.9	0.1	0.0	0.0	0.0	0.4	0.1	0.6	0.0	0.0	0.2	0.2	0.0
	Czechoslovakia	1995-97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cz-R	Czech Republic	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Czech Republic	1995-97	0.1	0.2	2.7	0.3	1.3	0.1	0.1	0.1	0.2	1.4	0.1	0.1	0.0	0.0	0.3	0.2	0.0	0.2	0.1	0.1	0.1
Slva	Slovakia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Slovakia	1995-97	0.1	0.8	4.0	0.2	0.6	0.1	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.1	0.1	0.2	0.0	0.1	0.1	0.1	0.0
Hun	Hungary	1986-88	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.3	1.0	0.0	0.1	0.0	0.2	0.0	0.5	0.0	0.0	0.0	0.0	0.0
	Hungary	1995-97	0.1	0.1	0.6	0.4	0.4	0.3	0.1	0.1	0.1	1.8	0.1	0.1	0.0	0.1	0.3	0.4	0.2	0.1	0.1	0.1	0.0
Bul	Bulgaria	1986-88	0.0	0.0	0.1	0.4	0.4	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.4	0.0
	Bulgaria	1995-97	0.1	0.2	1.0	0.5	0.4	0.1	0.1	0.0	0.1	1.4	0.0	0.0	0.1	0.1	0.3	0.3	0.1	0.0	0.3	0.3	0.1
Rom	Romania	1986-88	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.3	0.0	1.0	0.0	0.0	0.0	0.3	0.0
	Romania	1995-97	0.1	0.7	1.9	0.1	2.1	0.4	0.2	0.0	0.0	0.9	0.7	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.6	0.1	0.0
Indi	India	1986-88	0.0	0.0	0.6	0.1	0.3	0.1	0.1	0.0	0.0	0.5	0.5	0.1	0.0	0.4	0.2	0.3	0.9	0.2	0.0	0.2	0.0
	India	1995-97	0.0	0.3	2.0	0.6	1.4	0.2	0.0	0.7	0.0	0.6	0.2	0.1	0.0	0.2	0.7	0.3	0.2	0.1	0.1	0.0	0.0
Chin	China	1986-88	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	China	1995-97	0.0	0.2	1.0	0.2	0.3	0.2	0.0	0.1	0.1	0.5	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.0	0.0
Taiw	Taiwan	1986-88	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.1	0.0	0.0	0.1	0.5	0.0	0.0	0.1	0.0	0.0	0.0
	Taiwan	1995-97	0.0	0.1	0.5	0.2	0.1	0.0	0.1	0.0	0.0	0.6	0.1	0.2	0.1	0.0	0.3	0.1	0.1	0.0	0.0	0.0	0.0
SKor	South Korea	1986-88	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	South Korea	1995-97	0.0	0.1	1.1	0.5	0.9	0.1	0.0	0.8	0.0	0.4	0.1	0.1	0.0	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0
HKng	Hong Kong	1986-88	0.0	0.0	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.3
	Hong Kong	1995-97	0.0	0.0	0.3	0.1	0.3	0.3	0.1	0.1	0.0	0.6	0.1	0.0	0.0	0.1	0.7	0.1	0.0	0.1	0.0	0.0	0.0
Sing	Singapore	1986-88	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0	0.3	0.3	1.3	0.0	0.3	0.0	0.9	0.0	0.0	0.0	0.3	0.0	0.0
	Singapore	1995-97	0.0	0.0	0.3	0.0	0.3	0.3	0.1	0.0	0.2	0.9	0.2	0.0	0.0	0.0	0.9	0.3	0.0	0.0	0.0	0.0	0.0
Thai	Thailand	1986-88	0.0	0.0	0.6	0.2	0.0	0.2	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.6	0.4	0.2	0.2	0.0	0.0
	Thailand	1995-97	0.0	0.0	1.2	0.3	2.2	1.2	0.1	1.0	0.2	1.4	0.3	0.1	0.0	0.2	0.6	0.5	0.3	0.9	0.1	0.1	0.0
Malay	Malaysia	1986-88	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
	Malaysia	1995-97	0.0	0.0	0.9	0.4	0.2	0.2	0.0	0.2	0.0	0.2	0.9	0.5	0.2	0.4	0.4	0.7	1.1	0.2	0.4	0.2	0.0
Pak	Pakistan	1986-88	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.5	0.0	0.0	0.0	0.0	0.8	0.0	0.4	0.0	0.0	0.0
	Pakistan	1995-97	0.0	0.0	0.7	0.2	0.5	0.2	0.0	0.0	0.0	0.5	1.7	0.0	0.5	0.7	0.2	1.0	0.0	0.2	0.0	0.5	0.0
Philip	Philippines	1986-88	0.0	0.0	0.4	0.4	0.0	0.4	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	1.2	0.0	1.2	0.0	0.0	0.0
	Philippines	1995-97	0.2	0.0	0.9	1.1	1.5	1.1	0.0	1.1	0.4	0.9	0.0	0.2	0.0	0.0	0.0	0.4	0.2	0.7	0.0	0.2	0.0
Indo	Indonesia	1986-88	0.0	0.0	1.4	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.3	0.0	0.9	0.0	0.0	0.0
	Indonesia	1995-97	0.0	0.0	1.9	0.5	1.3	1.0	0.0	0.8	0.3	0.8	0.0	0.0	0.0	0.2	0.3	0.5	0.5	1.0	0.2	0.2	0.0
NZ	New Zealand	1986-88	0.0	0.0	0.3	0.1	0.1	0.2	0.0	0.1	0.0	0.4	0.0	0.1	0.0	0.1	0.7	0.1	0.0	0.0	0.1	0.0	0.0
	New Zealand	1995-97	0.1	0.0	0.8	0.3	0.5	0.2	0.1	0.1	0.0	1.5	0.0	0.1	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
USSR	USSR	1986-88	0.0	0.0	0.6	0.0	0.2	0.0	0.0	0.0	1.0	0.4	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.2	0.0
	USSR	1995-97	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ukr	Ukraine	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Ukraine	1995-97	0.1	0.2	1.0	0.2	2.2	0.0	0.1	0.1	0.0	0.8	0.0	0.0	0.0	0.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0
Bela	Belarus	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Belarus	1995-97	0.6	0.3	0.9	0.0	0.3	0.1	0.0	0.0	0.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uzb	Uzbekistan	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Uzbekistan	1995-97	0.0	5.1	4.2	0.0	0.4	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.8	0.0	0.0
Est	Estonia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Estonia	1995-97	1.1	0.0	0.2	0.2	1.9	0.0	0.2	0.0	0.2	0.6	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Lat	Latvia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Latvia	1995-97	1.8	0.0	0.3	0.0	0.6	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-61.
Patterns of international coauthorship in scientific and technical research for selected countries: 1986–97
(Percentages of internationally coauthored papers)

Code	Country	Year	Collaborating country (by country code)																							
			US	Jap	UK	Ger	Fra	Can	Rus	Ital	Atral	Neth	Swe	Den	Fin	Nor	Swit	Belg	Aus	Ire	Spn	Grce	Tur	Por	Yug	Cro	Slvn
Lith	Lithuania	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lithuania	1995-97	13.1	1.2	4.6	17.9	12.6	0.5	12.1	8.7	3.1	3.1	21.5	4.4	4.6	6.1	1.5	3.1	1.0	0.0	1.9	0.5	0.0	0.2	0.0	0.0	0.2
Arm	Armenia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Armenia	1995-97	26.8	1.1	3.5	20.8	13.7	1.4	42.6	6.3	3.5	4.9	4.9	3.2	0.4	0.4	5.3	5.3	0.0	0.4	7.0	1.8	0.0	1.1	0.0	0.0	0.0
Bra	Brazil	1986-88	39.2	1.8	10.3	11.3	14.1	6.9	0.0	5.1	0.6	1.5	1.1	0.7	1.2	0.3	1.9	2.2	0.4	0.5	1.7	0.1	0.0	0.6	0.2	0.0	0.0
	Brazil	1995-97	40.1	3.6	11.4	10.0	13.9	6.1	4.3	8.2	1.6	2.0	1.9	0.7	1.7	1.7	3.3	3.2	0.8	0.3	4.6	1.3	0.1	2.4	0.1	0.1	0.1
Arg	Argentina	1986-88	39.6	0.7	4.9	9.5	13.0	2.8	0.0	7.9	1.4	1.5	3.2	0.6	0.4	0.1	2.1	1.7	0.3	0.0	4.2	0.0	0.1	0.1	0.4	0.0	0.0
	Argentina	1995-97	33.8	2.1	6.5	10.1	11.4	4.2	0.6	5.9	1.6	2.5	2.9	1.7	0.9	0.2	2.1	1.2	1.0	0.2	16.0	0.3	0.2	0.1	0.0	0.1	0.3
Mex	Mexico	1986-88	55.3	1.4	7.9	6.8	9.4	7.1	0.0	1.6	0.6	1.0	1.7	0.3	0.3	0.0	1.7	0.9	0.2	0.1	6.7	0.4	0.0	0.2	0.4	0.0	0.0
	Mexico	1995-97	45.5	1.4	8.6	5.7	9.8	6.1	5.2	3.5	1.5	1.7	1.0	0.7	0.6	0.3	1.9	1.2	0.4	0.2	10.0	0.3	0.2	0.0	0.1	0.0	0.2
Chil	Chile	1986-88	44.4	1.9	6.6	10.4	9.7	6.0	0.0	4.6	1.4	1.7	1.3	0.4	0.7	0.4	2.4	4.1	0.4	0.1	9.1	0.0	0.0	0.0	0.1	0.0	0.0
	Chile	1995-97	38.4	1.6	9.0	12.9	11.9	5.1	1.2	4.3	2.3	2.7	3.6	0.9	1.0	0.3	2.2	3.2	0.7	0.1	10.3	0.4	0.1	0.5	0.3	0.0	0.3
Vene	Venezuela	1986-88	48.2	1.7	14.1	2.8	8.9	3.9	0.0	4.4	0.0	0.3	1.4	0.3	0.3	0.0	0.6	1.1	0.0	0.0	6.9	0.3	0.0	0.6	0.0	0.0	0.0
	Venezuela	1995-97	37.7	1.9	9.5	3.7	15.2	4.4	1.6	5.5	1.2	1.1	1.0	0.3	0.0	0.0	2.5	0.4	0.4	0.1	11.1	0.0	0.0	0.7	0.0	0.0	0.1
Col	Colombia	1986-88	55.7	2.2	7.7	6.6	6.0	5.5	0.0	1.6	1.6	1.1	2.2	0.0	0.0	1.6	1.6	1.1	0.0	0.0	1.1	0.0	0.0	0.5	0.0	0.0	0.0
	Colombia	1995-97	44.0	3.4	7.0	5.0	9.4	4.4	3.4	3.2	1.8	2.3	0.7	0.3	0.0	0.5	4.4	1.7	0.2	0.0	11.2	0.0	0.0	0.2	0.7	0.0	0.7
Cub	Cuba	1986-88	2.9	0.0	1.4	28.1	3.6	0.0	0.0	16.5	0.0	2.9	6.5	0.0	0.7	0.0	1.4	0.0	0.0	0.0	0.7	0.0	0.0	0.7	0.7	0.0	0.0
	Cuba	1995-97	8.9	1.6	2.7	6.7	6.5	4.3	2.4	4.8	0.5	1.1	4.6	1.1	0.5	0.0	2.2	1.3	0.8	0.0	30.1	0.0	0.0	0.0	0.0	0.0	0.3
Isr	Israel	1986-88	67.3	1.3	7.7	10.3	5.8	6.1	0.0	1.9	1.1	1.9	1.9	1.0	0.2	0.5	2.6	1.0	0.4	0.1	0.6	0.2	0.0	0.1	0.2	0.0	0.0
	Israel	1995-97	56.8	3.0	8.5	14.7	9.2	6.1	4.6	6.0	2.8	3.0	1.4	1.2	0.9	0.7	4.7	1.6	0.9	0.2	2.2	0.4	0.6	0.2	0.1	0.2	0.2
Saud	Saudi Arabia	1986-88	38.0	0.5	23.1	2.2	1.7	8.0	0.0	1.5	0.7	0.7	1.9	1.0	0.2	0.2	0.5	0.0	0.0	0.0	0.0	0.2	2.2	0.0	0.0	0.0	0.0
	Saudi Arabia	1995-97	35.5	4.0	20.2	3.8	4.2	7.4	0.3	1.2	1.7	1.7	2.9	0.7	0.2	0.3	0.9	1.7	0.9	0.3	0.9	0.5	2.4	0.3	0.0	0.2	0.0
Irn	Iran	1986-88	42.1	0.8	24.8	6.0	4.5	11.3	0.0	3.0	2.3	0.0	0.0	1.5	0.0	0.0	0.8	0.8	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
	Iran	1995-97	32.2	10.4	19.1	7.2	3.2	9.9	1.2	1.7	13.3	1.7	0.6	0.0	0.0	0.9	2.0	1.4	0.9	0.0	1.2	0.9	0.6	0.0	0.0	0.3	0.0
Jor	Jordan	1986-88	45.9	0.0	23.0	12.2	3.4	1.4	0.0	2.0	2.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	0.0	0.0	0.0	0.0
	Jordan	1995-97	27.1	2.3	15.4	17.3	3.3	4.7	1.4	1.9	2.3	0.9	1.4	0.9	0.0	0.5	0.9	0.5	0.0	0.5	0.5	0.9	0.9	0.0	0.0	0.0	0.0
Kuw	Kuwait	1986-88	27.0	2.5	27.0	2.0	2.0	9.8	0.0	1.5	1.0	1.5	7.8	0.5	0.0	1.0	1.5	0.0	0.0	2.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0
	Kuwait	1995-97	37.8	1.6	10.8	6.4	3.2	4.8	0.4	0.0	2.0	1.6	1.6	0.8	2.0	1.2	0.8	1.6	7.6	0.8	1.2	0.0	0.4	0.0	0.8	0.0	0.0
SAfr	South Africa	1986-88	39.7	2.6	19.8	11.5	3.0	6.0	0.0	3.6	7.5	1.3	1.4	0.4	0.2	0.3	2.4	2.4	0.8	0.3	0.3	0.3	0.1	0.2	0.1	0.0	0.0
	South Africa	1995-97	34.2	2.9	22.0	14.2	6.5	5.8	2.5	3.4	8.9	3.1	1.1	1.4	0.9	0.6	3.2	2.7	2.3	0.5	2.9	1.0	0.4	0.4	0.1	0.2	0.1
Egy	Egypt	1986-88	35.8	1.8	13.1	13.3	6.8	3.6	0.0	2.5	0.6	1.0	1.1	0.7	0.2	0.2	0.7	2.3	0.7	0.6	0.1	0.2	0.0	0.0	0.6	0.0	0.0
	Egypt	1995-97	36.5	7.5	7.2	12.3	4.1	4.4	1.0	4.9	0.5	2.7	0.6	0.7	1.9	0.9	1.9	2.3	2.2	0.1	1.4	0.2	0.6	0.1	0.0	0.1	0.0
Nig	Nigeria	1986-88	35.7	2.0	27.3	6.8	4.1	8.8	0.0	2.0	0.8	3.1	2.3	1.0	1.0	0.0	1.2	0.6	0.4	0.2	0.4	0.0	0.0	0.2	0.0	0.0	0.0
	Nigeria	1995-97	26.0	2.6	26.0	7.9	4.7	5.4	0.4	7.5	3.6	2.8	3.6	0.9	0.9	0.0	1.9	1.5	0.9	0.2	1.1	0.2	0.6	0.2	0.0	0.0	0.0
Ken	Kenya	1986-88	38.6	3.2	27.3	4.2	3.2	11.5	0.0	1.2	2.7	2.5	1.5	2.5	0.2	2.0	3.2	4.4	0.0	0.2	0.5	0.0	0.0	0.0	0.2	0.0	0.0
	Kenya	1995-97	30.3	3.3	32.5	4.5	2.8	9.2	0.0	2.4	1.8	4.3	2.4	3.6	0.0	0.8	4.2	4.9	0.3	1.2	1.1	0.1	0.1	0.0	0.7	0.0	0.5
Moroc	Morocco	1986-88	20.4	0.4	1.9	2.6	75.1	4.2	0.0	1.5	0.4	0.0	0.4	0.4	0.0	0.0	1.5	0.4	0.4	0.4	2.3	0.0	0.0	0.0	0.8	0.0	0.0
	Morocco	1995-97	9.7	1.7	2.6	2.6	76.6	3.5	0.9	3.9	0.2	0.6	0.6	0.1	0.0	0.0	2.1	3.9	0.1	0.0	4.5	0.1	0.2	0.2	0.1	0.3	0.0
Alg	Algeria	1986-88	5.0	0.5	5.9	0.9	70.3	2.3	0.0	4.1	1.8	0.0	0.5	0.0	0.0	0.0	1.4	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0
	Algeria	1995-97	7.5	0.8	5.3	4.1	77.4	1.6	0.8	4.7	0.0	1.2	0.6	0.4	0.0	0.0	1.2	2.8	0.2	0.0	2.6	0.6	0.6	0.4	0.0	0.2	0.2
Tun	Tunisia	1986-88	5.4	0.0	0.9	3.6	85.7	2.2	0.0	1.8	0.0	1.3	0.4	0.0	0.0	0.0	1.8	2.7	0.0	0.0	0.4	0.4	0.0	0.4	0.0	0.0	0.0
	Tunisia	1995-97	9.1	1.7	2.8	4.1	79.3	2.8	1.7	1.7	1.4	1.7	0.6	0.3	0.0	0.6	2.2	3.3	0.0	0.0	2.2	0.0	0.3	0.3	0.3	0.0	0.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-61.
Patterns of international coauthorship in scientific and technical research for selected countries: 1986–97
(Percentages of internationally coauthored papers)

			Collaborating country (by country code)																							
Code	Country	Year	Pol	Cze	Cz-R	Slva	Hun	Bul	Rom	Indi	Chin	Taiw	SKor	HKng	Sing	Thai	Malay	Pak	Philip	Indo	NZ	USSR	Ukr	Bela	Uzb	Est	Lat
Lith	Lithuania	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lithuania	1995-97	6.1	0.0	1.2	0.5	0.7	0.5	0.2	0.5	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.5	0.0	0.5	1.2	0.0	1.5	1.5
Arm	Armenia	1986-88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Armenia	1995-97	5.3	0.0	2.5	4.9	1.8	1.1	3.5	4.2	4.6	0.7	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	2.1	0.7	4.2	0.0	0.0
Bra	Brazil	1986-88	2.0	0.2	0.0	0.0	0.2	0.1	0.1	0.9	0.3	0.2	0.0	0.1	0.1	0.2	0.0	0.1	0.1	0.2	0.2	1.1	0.0	0.0	0.0	0.0	0.0
	Brazil	1995-97	2.0	0.0	1.8	1.3	0.4	0.2	0.5	1.6	1.4	0.3	0.7	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.4	0.0	0.5	0.1	0.2	0.0	0.0
Arg	Argentina	1986-88	0.3	0.1	0.0	0.0	0.1	0.4	0.0	0.6	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	Argentina	1995-97	0.2	0.0	0.6	0.1	0.6	0.3	0.0	1.2	0.6	0.2	0.9	0.1	0.0	0.1	0.1	0.0	0.2	0.1	0.3	0.0	0.2	0.0	0.0	0.0	0.0
Mex	Mexico	1986-88	2.1	0.0	0.0	0.0	0.4	0.3	0.1	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.7	0.0	0.0	0.0	0.0	0.0
	Mexico	1995-97	2.3	0.0	1.6	0.3	0.5	0.2	1.0	2.1	0.7	0.1	1.2	0.3	0.1	0.7	0.0	0.1	0.2	0.3	0.5	0.0	2.2	0.1	0.0	0.3	0.1
Chil	Chile	1986-88	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
	Chile	1995-97	0.7	0.0	0.2	0.1	0.8	0.1	0.3	0.5	1.0	0.0	0.2	0.5	0.3	0.8	0.1	0.1	0.3	0.4	0.4	0.0	0.1	0.1	0.0	0.0	0.0
Vene	Venezuela	1986-88	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.6	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
	Venezuela	1995-97	1.5	0.0	0.5	0.0	0.4	0.1	0.4	0.0	0.1	0.3	0.0	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.3	0.0	0.4	0.0	0.0	0.1	0.0
Col	Colombia	1986-88	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
	Colombia	1995-97	0.7	0.0	0.3	0.0	0.7	0.0	0.0	5.5	1.5	0.0	5.5	0.7	0.0	1.7	0.2	0.0	0.8	0.8	0.5	0.0	0.5	0.0	0.0	0.0	0.0
Cub	Cuba	1986-88	0.0	12.2	0.0	0.0	4.3	0.7	0.0	0.7	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	25.2	0.0	0.0	0.0	0.0	0.0
	Cuba	1995-97	0.0	0.0	1.6	0.0	1.1	0.3	0.0	0.3	1.9	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.5	0.3	0.0	0.0	0.3	0.0	0.3	0.0
Isr	Israel	1986-88	0.3	0.0	0.0	0.0	0.4	0.0	0.0	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0
	Israel	1995-97	1.1	0.0	0.7	0.1	0.9	0.3	0.2	0.4	0.5	0.2	0.2	0.2	0.1	0.2	0.0	0.0	0.1	0.1	0.6	0.0	0.3	0.1	0.0	0.0	0.0
Saud	Saudi Arabia	1986-88	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.2	0.0	0.0	1.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Saudi Arabia	1995-97	0.5	0.0	0.3	0.0	0.3	0.0	1.7	1.2	0.9	0.3	0.3	0.5	0.3	0.5	0.9	1.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.0
Irn	Iran	1986-88	0.0	0.0	0.0	0.0	1.5	0.0	0.8	3.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
	Iran	1995-97	0.0	0.0	1.2	0.0	1.4	0.0	0.0	1.7	1.2	1.7	0.9	0.3	0.0	0.3	0.9	0.0	0.3	0.0	0.6	0.0	0.3	0.0	0.0	0.0	0.0
Jor	Jordan	1986-88	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Jordan	1995-97	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	1.4	1.4	0.5	0.0	0.0	0.0	0.5	0.9	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Kuw	Kuwait	1986-88	0.0	3.4	0.0	0.0	2.0	0.0	0.5	5.4	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0
	Kuwait	1995-97	1.6	0.0	0.4	0.4	2.0	0.8	0.0	4.4	0.8	0.4	0.8	1.6	0.0	0.8	0.8	1.2	0.0	0.4	0.4	0.0	0.4	0.0	0.0	0.0	0.0
SAfr	South Africa	1986-88	0.6	0.1	0.0	0.0	0.1	0.0	0.0	0.5	0.2	0.3	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.1	0.9	0.3	0.0	0.0	0.0	0.0	0.0
	South Africa	1995-97	2.3	0.0	0.5	0.1	0.5	0.2	0.0	1.5	0.8	0.4	0.3	0.9	0.5	0.3	0.1	0.0	0.0	0.1	1.6	0.0	0.7	0.0	0.0	0.0	0.0
Egy	Egypt	1986-88	2.9	1.3	0.0	0.0	1.3	0.1	0.3	0.9	0.2	0.0	0.0	0.1	0.0	0.3	0.0	0.2	0.3	0.6	0.1	0.7	0.0	0.0	0.0	0.0	0.0
	Egypt	1995-97	1.3	0.0	0.5	0.3	1.0	0.3	0.0	1.1	0.8	0.1	0.5	0.3	0.2	0.4	0.3	0.3	0.1	0.2	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Nig	Nigeria	1986-88	0.4	0.0	0.0	0.0	0.2	0.0	0.0	4.9	0.2	0.0	0.0	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0
	Nigeria	1995-97	0.9	0.0	0.0	0.0	1.3	0.4	0.2	1.7	1.1	0.6	1.1	0.0	0.0	0.6	1.3	0.0	0.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ken	Kenya	1986-88	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.2	0.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Kenya	1995-97	0.1	0.0	0.8	0.1	0.7	0.0	0.0	0.7	1.1	0.0	0.0	0.5	0.0	1.2	0.1	0.1	0.4	0.8	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Moroc	Morocco	1986-88	0.0	1.1	0.0	0.0	0.0	0.4	0.0	0.4	0.4	0.0	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.0
	Morocco	1995-97	1.0	0.0	0.3	0.1	0.3	0.4	0.8	0.3	0.4	0.1	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.2	0.0	0.0
Alg	Algeria	1986-88	1.8	1.4	0.0	0.0	0.0	1.4	0.5	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0
	Algeria	1995-97	0.6	0.0	0.6	0.2	0.8	1.0	0.2	0.2	0.6	0.0	0.0	0.2	0.0	0.2	0.2	0.4	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Tun	Tunisia	1986-88	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Tunisia	1995-97	0.8	0.0	0.6	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-61.

Patterns of international coauthorship in scientific and technical research for selected countries: 1986–97

(Percentages of internationally coauthored papers)

			Collaborating country (by country code)																			
Code	Country	Year	Lith	Arm	Bra	Arg	Mex	Chil	Vene	Col	Cub	Isr	Saud	Irn	Jor	Kuw	SAfr	Egy	Nig	Ken	Moroc	Alg	Tun
Lith	Lithuania	1986-88		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Lithuania	1995-97		0.0	1.5	0.0	0.5	0.0	0.0	0.0	0.0	1.5	0.2	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0
Arm	Armenia	1986-88	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Armenia	1995-97	0.0		5.3	0.0	1.4	0.4	0.0	0.4	0.0	4.2	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Bra	Brazil	1986-88	0.0	0.0		4.8	1.1	2.6	0.4	0.3	0.0	1.3	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.0	0.0	0.0
	Brazil	1995-97	0.1	0.3		4.4	2.6	2.3	0.8	1.5	0.6	1.3	0.0	0.0	0.0	0.1	0.5	0.1	0.1	0.2	0.1	0.1	0.0
Arg	Argentina	1986-88	0.0	0.0	11.9		1.4	3.9	1.7	0.0	0.1	1.4	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.1	0.0	0.0	0.0
	Argentina	1995-97	0.0	0.0	10.7		3.6	5.4	1.8	1.6	0.3	0.8	0.0	0.0	0.0	0.0	0.7	0.2	0.0	0.0	0.0	0.2	0.0
Mex	Mexico	1986-88	0.0	0.0	2.1	1.0		1.4	0.5	0.9	0.1	1.0	0.1	0.1	0.0	0.0	0.5	0.1	0.1	0.0	0.0	0.0	0.0
	Mexico	1995-97	0.1	0.1	4.9	2.8		1.7	1.1	2.7	2.5	1.6	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.2	0.0	0.1	0.1
Chil	Chile	1986-88	0.0	0.0	6.7	4.0	2.0		1.0	0.3	0.0	0.9	1.0	0.0	0.0	0.0	1.1	0.1	0.1	0.1	0.0	0.0	0.0
	Chile	1995-97	0.0	0.1	8.5	8.2	3.4		1.3	1.6	0.4	1.6	0.0	0.0	0.0	0.0	1.1	0.2	0.2	0.5	0.1	0.1	0.0
Vene	Venezuela	1986-88	0.0	0.0	1.9	3.3	1.4	1.9		0.3	0.3	0.8	0.0	0.0	0.3	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0
	Venezuela	1995-97	0.0	0.0	6.3	5.8	4.5	2.6		2.3	0.8	0.5	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.4	0.0	0.0
Col	Colombia	1986-88	0.0	0.0	3.3	0.0	4.9	1.1	0.5		0.0	0.5	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.0	0.5	0.0	0.0
	Colombia	1995-97	0.0	0.2	13.9	6.2	13.4	4.2	2.9		1.2	0.7	0.0	0.0	0.0	0.0	0.3	0.2	0.3	1.0	0.0	0.2	0.0
Cub	Cuba	1986-88	0.0	0.0	0.0	0.7	0.7	0.0	0.7	0.0		0.7	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0
	Cuba	1995-97	0.0	0.0	9.4	1.6	20.4	1.6	1.6	1.9		0.3	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.5	0.3	0.3	0.0
Isr	Israel	1986-88	0.0	0.0	0.5	0.2	0.2	0.1	0.1	0.0	0.0		0.0	0.0	0.0	0.0	1.5	0.2	0.0	0.1	0.0	0.0	0.0
	Israel	1995-97	0.1	0.2	1.0	0.2	0.6	0.3	0.1	0.1	0.0		0.0	0.0	0.1	0.0	1.0	0.1	0.0	0.2	0.0	0.0	0.0
Saud	Saudi Arabia	1986-88	0.0	0.0	0.0	0.0	0.2	1.7	0.0	0.0	0.0	0.5		0.0	1.5	0.5	0.5	11.7	0.2	0.0	0.0	0.0	0.0
	Saudi Arabia	1995-97	0.2	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.3		0.3	1.7	1.0	0.9	12.3	0.0	0.3	0.5	1.0	0.3
Irn	Iran	1986-88	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.8	0.0		0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Iran	1995-97	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6		0.3	0.6	0.6	0.6	0.3	0.3	0.0	0.0	0.0
Jor	Jordan	1986-88	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	4.1	0.7		2.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0
	Jordan	1995-97	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	1.9	4.7	0.5		0.0	0.5	4.2	0.9	0.5	0.0	0.0	0.9
Kuw	Kuwait	1986-88	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	1.0	0.0	1.5		0.0	6.9	0.5	0.0	0.0	0.0	0.0
	Kuwait	1995-97	0.0	0.0	2.0	0.4	0.0	0.0	0.4	0.0	0.0	0.4	2.4	0.8	0.0		0.4	14.7	0.4	0.0	0.0	0.0	0.0
SAfr	South Africa	1986-88	0.0	0.0	0.3	0.2	0.4	0.7	0.0	0.1	0.0	6.6	0.2	0.0	0.0	0.0		0.3	0.2	0.2	0.0	0.0	0.0
	South Africa	1995-97	0.1	0.1	1.3	0.8	0.4	0.8	0.0	0.1	0.0	3.6	0.2	0.1	0.0	0.0		0.3	0.2	0.4	0.0	0.0	0.1
Egy	Egypt	1986-88	0.0	0.0	0.3	0.1	0.1	0.1	0.1	0.0	0.1	1.1	5.5	0.0	0.6	1.6	0.5		0.1	0.2	0.0	0.3	0.2
	Egypt	1995-97	0.0	0.0	0.4	0.3	0.4	0.2	0.0	0.1	0.1	0.8	5.3	0.1	0.7	2.8	0.4		0.1	0.7	0.0	0.1	0.0
Nig	Nigeria	1986-88	0.0	0.0	0.6	0.0	0.2	0.2	0.0	0.2	0.0	0.2	0.2	0.0	0.0	0.2	0.4	0.2		1.0	0.0	0.0	0.0
	Nigeria	1995-97	0.0	0.0	1.1	0.2	0.0	0.6	0.2	0.4	0.4	0.2	0.0	0.2	0.4	0.2	0.9	0.4		1.7	0.4	0.0	0.0
Ken	Kenya	1986-88	0.0	0.0	1.0	0.2	0.0	0.2	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.5	0.5	1.2		0.0	0.0	0.0
	Kenya	1995-97	0.0	0.0	1.3	0.1	0.8	0.9	0.0	0.8	0.3	1.6	0.3	0.1	0.1	0.0	1.2	1.2	1.1		0.3	0.0	0.0
Moroc	Morocco	1986-88	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.4	0.4
	Morocco	1995-97	0.2	0.0	0.7	0.1	0.0	0.2	0.3	0.0	0.1	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.2		0.9	1.1
Alg	Algeria	1986-88	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.5		0.5
	Algeria	1995-97	0.0	0.0	0.6	1.0	0.8	0.2	0.0	0.2	0.2	0.0	1.2	0.0	0.0	0.0	0.2	0.2	0.0	0.0	1.8		1.6
Tun	Tunisia	1986-88	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.4	0.4	
	Tunisia	1995-97	0.0	0.0	0.6	0.0	0.6	0.0	0.0	0.0	0.0	0.6	0.6	0.0	0.6	0.0	0.6	0.0	0.0	0.0	3.0	2.2	

NA = not applicable

NOTES: A country's row values indicate the distribution of its internationally coauthored papers across collaborating countries. A country's column values indicate its relative prominence in row countries' portfolios of internationally coauthored articles. Row percentages may add to more than 100 because articles are counted in each contributing country and some may have authors in three or more countries.

SOURCES: Institute for Scientific Information, Science Citation Index and Social Science Citation Index; CHI Research, Inc., Science Indicators database; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See figures 6-37 and 6-38 in Volume 1.

Appendix table 6-62.
Citations to foreign literature in scientific and technical journals for selected countries, by field: 1990 and 1997
(Percentages)

Citing country	Citing year	Field											
		S&E total	Physics	Chemistry	Earth/space sciences	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering technology	Psychology	Social sciences	Health professional
World average	1990	53.4	58.2	53.5	52.1	50.3	50.2	53.9	54.8	47.1	37.3	32.8	22.5
	1997	59.4	64.2	60.3	57.9	56.1	57.4	59.0	60.8	54.7	42.1	39.6	31.1
United States	1990	29.6	34.4	36.4	28.8	29.5	28.7	29.8	30.0	26.7	17.8	14.7	9.5
	1997	33.5	40.9	40.7	32.0	32.7	33.4	32.3	34.5	31.8	20.2	17.2	10.7
Japan	1990	61.9	59.8	47.2	69.6	68.0	44.4	69.4	66.3	44.8	71.0	75.0	82.1
	1997	64.8	56.1	51.7	75.0	60.6	51.5	74.2	68.3	46.1	76.0	75.8	89.3
United Kingdom	1990	66.8	71.6	66.9	68.3	53.9	59.7	71.7	64.9	56.6	59.3	49.9	50.2
	1997	70.4	73.2	69.4	71.9	66.5	66.0	75.1	68.9	60.9	62.3	49.5	56.8
Germany	1990	71.0	68.2	56.0	76.7	68.8	63.5	74.5	76.8	56.1	71.8	72.5	76.6
	1997	73.4	67.1	59.8	77.2	68.7	69.8	77.5	79.5	60.3	71.3	75.1	74.3
France	1990	74.1	70.1	62.0	69.8	66.6	70.0	76.8	78.7	65.0	80.5	80.3	84.3
	1997	76.4	71.1	67.2	75.0	54.3	71.9	80.1	80.7	64.8	74.9	74.6	89.7
Canada	1990	73.7	74.9	67.6	64.7	70.2	57.6	79.3	78.1	63.5	69.5	69.1	76.6
	1997	75.8	72.7	70.5	65.7	72.7	59.5	81.6	79.7	64.3	68.5	74.2	77.3
Russia	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	69.0	71.0	55.8	75.8	76.2	73.7	72.5	86.0	61.5	48.2	52.9	86.7
Italy	1990	77.9	76.9	66.6	80.9	68.3	73.9	82.5	79.4	73.3	76.7	92.7	78.3
	1997	78.3	74.4	69.0	79.8	67.3	77.7	83.5	80.0	68.2	77.3	86.8	93.9
Australia	1990	72.5	73.1	66.3	68.4	68.0	54.5	78.0	76.7	69.5	75.0	73.6	73.7
	1997	76.8	75.0	70.9	75.6	75.5	57.0	83.0	80.6	75.1	77.1	77.1	73.1
Netherlands	1990	77.0	75.5	68.8	75.2	72.8	67.8	79.1	79.2	73.5	78.0	75.5	70.8
	1997	78.6	78.0	75.3	79.0	72.8	70.4	81.0	79.5	70.3	74.9	79.1	74.7
Sweden	1990	73.5	77.2	65.7	71.0	71.3	69.8	75.1	73.8	72.8	72.5	73.5	65.2
	1997	77.7	77.6	72.5	81.7	64.6	73.9	81.0	77.2	69.7	75.7	88.9	69.8
Denmark	1990	78.4	81.1	77.1	86.6	77.4	74.9	79.7	77.2	74.4	90.5	82.4	78.8
	1997	80.4	82.6	78.0	82.5	73.8	77.3	82.6	79.0	73.0	84.9	85.0	83.1
Finland	1990	80.3	83.2	72.4	81.6	55.2	79.6	84.4	78.6	70.6	77.5	86.7	72.0
	1997	80.2	77.8	79.1	78.5	83.9	73.5	85.6	79.4	68.6	79.5	82.9	85.7
Norway	1990	78.8	86.8	68.8	76.5	70.1	69.9	82.2	79.5	67.0	73.8	73.4	89.7
	1997	82.1	88.2	76.9	74.6	72.7	72.4	87.2	82.3	83.0	83.3	76.6	87.4
Switzerland	1990	82.7	81.3	71.9	77.2	77.7	84.0	83.1	85.8	74.4	84.2	92.7	88.7
	1997	83.4	79.5	75.8	82.4	82.9	81.2	85.2	87.1	70.1	85.6	89.4	89.9
Belgium	1990	81.5	80.0	77.1	80.2	61.0	77.1	83.5	82.2	73.6	84.4	80.3	72.6
	1997	83.8	79.7	75.9	84.1	78.3	80.2	85.5	86.2	77.5	85.7	91.1	88.3
Austria	1990	84.1	79.0	66.1	87.8	67.3	73.8	87.6	86.9	74.8	85.0	93.1	82.4
	1997	86.1	80.3	77.4	86.4	78.6	84.5	87.6	88.6	78.8	85.4	92.8	91.9
Ireland	1990	86.9	85.2	79.9	72.6	92.3	85.4	90.2	89.5	75.6	84.2	82.1	91.7
	1997	89.8	84.2	90.7	88.3	72.0	87.4	91.3	90.8	86.3	71.4	95.1	95.7
Spain	1990	78.1	79.5	64.2	84.3	71.3	79.4	78.5	86.1	74.9	92.4	88.0	91.1
	1997	78.3	77.3	68.5	80.6	61.7	71.9	82.2	85.3	71.7	81.1	83.8	90.0
Greece	1990	79.8	82.8	67.7	74.0	67.2	75.3	84.8	88.2	68.3	100.0	71.1	81.8
	1997	84.2	83.5	79.9	72.2	60.0	72.3	86.8	91.1	73.5	94.7	93.6	91.7

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-62.
Citations to foreign literature in scientific and technical journals for selected countries, by field: 1990 and 1997
(Percentages)

Citing country	Citing year	Field											
		S&E total	Physics	Chemistry	Earth/space sciences	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering technology	Psychology	Social sciences	Health professional
Turkey	1990	83.0	87.6	61.3	87.0	60.0	92.1	91.9	89.5	78.6	96.8	89.5	66.7
	1997	83.5	83.7	60.4	79.4	77.8	86.9	89.3	91.5	74.5	62.5	87.2	86.2
Portugal	1990	84.3	87.2	73.8	92.2	86.4	86.0	88.5	86.9	65.8	100.0	100.0	80.0
	1997	84.6	85.0	79.4	86.6	78.3	80.7	87.4	89.7	73.6	63.6	88.9	100.0
Yugoslavia	1990	82.0	83.3	75.3	78.9	69.6	89.1	84.3	86.5	65.3	85.0	64.3	78.6
	1997	80.0	70.5	81.4	82.8	100.0	68.2	86.1	89.1	69.4	100.0	0.0	100.0
Croatia	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	80.7	79.5	70.8	80.3	78.6	66.7	94.4	89.2	66.7	91.7	20.4	86.7
Slovenia	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	82.7	80.9	74.7	95.6	66.7	81.5	83.6	89.9	82.4	100.0	50.0	100.0
Poland	1990	75.3	75.4	62.8	85.2	58.3	79.7	83.2	84.3	68.2	90.9	73.3	71.4
	1997	80.7	79.6	71.3	86.5	73.3	82.9	91.1	89.5	71.0	91.9	70.6	80.0
Czechoslovakia	1990	79.6	81.6	70.8	77.1	62.5	85.2	84.0	85.3	81.9	85.4	45.0	100.0
	1997	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Czech Republic	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	88.5	87.5	81.0	92.0	78.4	86.6	92.2	94.5	83.3	79.5	77.8	100.0
Slovakia	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	87.3	89.1	82.5	87.8	84.2	95.7	90.1	90.3	77.7	55.6	80.0	0.0
Hungary	1990	82.6	84.4	72.3	88.2	74.3	91.4	84.8	88.8	80.9	66.7	55.6	31.3
	1997	84.4	83.8	76.7	88.9	76.5	80.4	86.3	91.1	84.0	70.5	76.9	57.7
Bulgaria	1990	79.9	82.2	81.5	87.3	79.4	90.4	70.6	87.2	69.5	33.3	100.0	100.0
	1997	79.5	82.2	68.3	91.2	70.8	82.2	86.1	91.8	60.3	100.0	100.0	40.0
Romania	1990	79.5	83.5	65.8	69.2	75.0	100.0	80.5	88.2	70.6	NA	NA	100.0
	1997	82.2	86.6	70.0	80.6	85.1	85.7	91.3	96.0	67.0	NA	100.0	NA
India	1990	68.7	76.9	55.3	69.2	65.4	67.1	74.5	75.4	57.7	73.8	69.6	73.1
	1997	73.9	75.6	65.3	76.2	78.4	74.7	80.9	82.8	59.9	76.9	68.4	75.9
China	1990	84.4	86.3	76.6	89.0	85.4	89.0	85.5	86.2	79.7	100.0	95.2	100.0
	1997	80.3	79.1	75.9	86.7	71.9	82.3	90.9	89.6	75.2	93.1	88.5	84.7
Taiwan	1990	84.1	87.2	80.8	88.5	72.1	76.1	88.8	86.5	76.2	100.0	90.5	100.0
	1997	80.2	82.7	71.6	77.6	85.6	66.7	87.6	83.3	71.1	80.5	90.1	88.3
South Korea	1990	84.5	91.1	74.8	92.3	91.2	94.6	91.3	92.9	74.3	100.0	81.3	100.0
	1997	84.9	85.6	75.3	89.0	88.0	85.6	92.2	90.5	80.3	96.8	90.3	100.0
Hong Kong	1990	85.3	79.0	76.1	94.1	75.0	88.9	90.3	87.6	82.4	71.1	82.1	76.7
	1997	88.2	90.5	88.7	78.3	94.9	87.5	91.9	86.8	87.4	80.9	87.6	89.8
Singapore	1990	83.1	86.9	75.8	52.4	88.2	85.1	85.5	88.3	70.6	100.0	77.8	100.0
	1997	86.8	82.1	82.5	97.9	75.3	73.0	94.2	91.4	82.4	83.3	87.0	94.3
Thailand	1990	90.8	100.0	97.5	93.3	100.0	88.9	91.0	86.7	91.7	NA	92.9	78.6
	1997	86.1	90.7	89.4	93.1	NA	79.6	89.9	84.2	93.5	100.0	71.4	81.8
Malaysia	1990	87.6	86.2	83.8	77.8	100.0	84.4	73.9	93.8	100.0	NA	100.0	83.3
	1997	82.4	96.8	66.7	87.0	0.0	70.5	92.2	91.7	88.5	66.7	100.0	100.0
Pakistan	1990	83.5	85.8	68.2	93.1	50.0	70.7	100.0	97.2	75.0	NA	100.0	100.0
	1997	84.5	79.4	75.4	90.9	100.0	85.0	93.1	91.0	57.1	100.0	100.0	70.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-62.
Citations to foreign literature in scientific and technical journals for selected countries, by field: 1990 and 1997
(Percentages)

Citing country	Citing year	Field											
		S&E total	Physics	Chemistry	Earth/space sciences	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering technology	Psychology	Social sciences	Health professional
Philippines	1990	80.0	100.0	80.0	94.1	NA	67.9	87.9	88.9	NA	100.0	88.9	100.0
	1997	82.9	53.3	80.0	93.8	0.0	76.6	89.2	97.6	50.0	100.0	100.0	50.0
Bangladesh	1990	73.4	80.0	71.4	60.0	NA	80.0	75.0	70.6	33.3	100.0	71.4	NA
	1997	81.0	93.2	52.6	90.0	100.0	93.8	75.9	85.6	50.0	NA	90.0	100.0
New Zealand	1990	81.2	73.5	83.4	72.5	83.3	65.6	86.6	85.0	80.3	80.7	86.0	75.2
	1997	82.3	84.5	83.2	67.1	82.6	65.8	88.5	87.3	82.5	82.7	86.3	86.5
USSR	1990	65.1	63.6	50.0	69.7	85.9	74.5	65.7	83.7	63.3	76.4	68.0	68.1
	1997	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ukraine	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	75.0	76.5	61.0	85.6	76.9	77.8	84.1	87.5	61.5	66.7	0.0	100.0
Belarus	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	78.3	77.0	66.4	88.0	80.0	94.4	92.4	93.9	77.8	NA	NA	50.0
Uzbekistan	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	66.6	74.8	22.7	93.3	100.0	100.0	94.0	100.0	100.0	NA	NA	NA
Estonia	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	88.6	79.0	82.5	89.1	100.0	90.6	96.6	94.4	92.6	100.0	100.0	100.0
Latvia	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	82.2	74.5	78.3	88.9	100.0	80.0	91.5	98.0	80.0	100.0	NA	NA
Lithuania	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	85.6	79.7	84.8	94.4	100.0	85.7	91.1	98.6	80.0	NA	NA	100.0
Armenia	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	83.3	86.8	44.4	92.3	0.0	0.0	73.1	93.1	50.0	NA	NA	NA
Brazil	1990	82.1	82.7	75.3	84.6	76.3	75.1	81.1	86.0	80.9	78.3	76.5	31.9
	1997	81.7	80.0	79.0	86.7	78.4	78.9	82.1	85.1	72.5	74.5	81.3	45.7
Argentina	1990	77.7	78.4	65.9	87.2	83.3	76.7	80.1	80.9	67.4	81.3	100.0	NA
	1997	82.3	79.8	74.1	88.5	83.3	75.2	87.7	86.3	69.1	75.5	60.0	20.0
Mexico	1990	82.4	79.0	68.3	84.7	79.4	74.5	87.5	82.8	93.3	87.8	83.3	70.0
	1997	84.1	83.4	78.7	85.5	92.0	81.0	86.4	85.6	83.9	70.6	94.6	88.9
Chile	1990	82.1	90.8	61.9	84.1	81.3	72.2	84.9	86.0	82.6	100.0	87.5	80.0
	1997	83.9	82.8	68.4	92.8	67.9	76.0	84.6	86.9	83.9	83.3	85.7	88.5
Venezuela	1990	85.8	79.7	78.6	89.3	100.0	89.9	87.0	89.7	80.0	100.0	71.4	83.3
	1997	83.7	75.4	80.4	89.3	72.2	87.7	89.7	85.3	67.7	80.0	100.0	71.4
Colombia	1990	84.8	96.0	100.0	100.0	100.0	69.8	78.6	93.3	86.7	88.9	83.3	66.7
	1997	90.1	89.9	84.4	93.5	100.0	83.5	92.2	95.7	60.0	75.0	100.0	100.0
Cuba	1990	86.7	88.4	66.7	100.0	100.0	100.0	97.1	83.7	75.0	NA	NA	66.7
	1997	71.6	82.8	68.6	100.0	NA	89.5	82.7	53.7	38.5	100.0	100.0	NA
Israel	1990	80.6	77.8	76.3	78.0	68.2	73.0	83.8	84.0	69.8	73.3	72.1	77.0
	1997	82.1	78.3	73.7	81.7	74.3	70.5	86.7	85.3	75.3	75.7	77.9	81.8
Saudi Arabia	1990	77.6	79.6	61.5	87.2	60.0	74.5	72.9	83.4	70.6	NA	100.0	85.7
	1997	84.7	72.1	83.7	70.3	80.0	81.4	82.9	91.4	72.4	100.0	50.0	81.3
Iran	1990	86.5	90.9	59.1	71.4	100.0	90.9	84.6	100.0	100.0	100.0	100.0	100.0
	1997	79.0	91.0	68.5	79.2	66.7	81.8	92.3	77.4	81.5	100.0	100.0	100.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-62.
Citations to foreign literature in scientific and technical journals for selected countries, by field: 1990 and 1997
(Percentages)

Citing country	Citing year	Field											
		S&E total	Physics	Chemistry	Earth/space sciences	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering technology	Psychology	Social sciences	Health professional
Jordan	1990	77.1	65.1	64.1	55.6	NA	90.0	91.8	88.7	82.1	100.0	100.0	100.0
	1997	87.8	86.3	89.4	100.0	50.0	82.4	78.6	90.3	83.3	100.0	100.0	100.0
Kuwait	1990	81.1	100.0	70.7	60.0	50.0	73.4	87.7	82.3	70.9	100.0	100.0	63.6
	1997	91.7	67.9	89.0	91.7	80.0	90.2	92.6	97.2	87.5	83.3	100.0	100.0
South Africa	1990	73.1	74.5	62.8	76.2	73.5	61.6	75.2	78.0	64.6	84.4	62.0	79.7
	1997	79.8	78.9	79.4	72.4	51.6	67.7	84.3	86.4	78.0	77.0	62.4	85.7
Egypt	1990	61.7	69.6	38.6	72.5	40.0	71.6	81.2	78.5	69.7	100.0	88.9	100.0
	1997	73.4	71.4	56.6	75.0	100.0	87.9	87.5	86.3	69.5	100.0	75.0	95.0
Nigeria	1990	65.6	91.7	48.7	66.7	50.0	56.6	81.3	67.1	65.4	33.3	72.7	74.3
	1997	69.3	72.7	66.7	82.8	81.3	51.9	76.1	73.7	28.6	100.0	62.5	80.0
Kenya	1990	70.1	100.0	100.0	100.0	NA	70.3	68.3	69.3	0.0	75.0	80.0	60.0
	1997	82.9	80.0	60.0	85.0	100.0	72.7	90.9	82.2	100.0	100.0	100.0	100.0
Morocco	1990	88.4	92.9	80.4	100.0	100.0	100.0	94.7	83.3	76.9	0.0	NA	NA
	1997	88.6	87.1	83.8	90.5	88.9	88.1	95.2	93.4	92.1	100.0	NA	NA
Algeria	1990	93.7	87.5	95.0	90.9	100.0	100.0	100.0	100.0	100.0	100.0	NA	NA
	1997	84.7	85.1	87.7	85.7	100.0	83.3	90.9	92.3	64.0	NA	NA	100.0
Tunisia	1990	89.7	78.6	88.5	88.9	100.0	100.0	97.4	88.9	0.0	100.0	NA	NA
	1997	90.4	92.8	77.8	100.0	90.9	95.0	95.4	95.3	84.0	NA	100.0	100.0

NA = not appropriate: either no citations or not in existence in year indicated

NOTE: Citations are to three years' articles with two-year lag; for example, 1997 citation counts are to articles published in 1993–95.

SOURCE: Institute for Scientific Information, Science Citation and Social Science Citation Indexes; CHI Research, Inc., Science Indicators database; National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See page 6-52 in Volume 1.

Appendix table 6-63.
Citations to U.S. literature in scientific and technical journals for selected countries, by field: 1990 and 1997
(Percentages of all citations to foreign sources)

Citing country	Citing year	Field											
		All fields	Physics	Chemistry	Earth/space sciences	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering technology	Psychology	Social sciences	Health professional
U.S. percentage of world articles													
U.S. articles as pct. of world's total	1990	38.2	29.8	22.7	41.4	39.9	37.4	38.4	40.2	37.8	61.3	54.7	72.1
	1997	35.3	25.4	21.9	39.0	36.4	32.7	39.1	38.0	33.6	56.5	51.5	66.9
U.S. percentage of countries' citations to foreign articles													
World average	1990	51.5	48.5	40.3	52.9	50.2	42.1	56.6	52.0	48.5	66.1	65.8	71.3
	1997	46.9	38.9	36.1	49.5	46.5	37.4	54.7	47.9	39.9	58.3	61.9	64.5
Japan	1990	58.9	58.0	51.1	59.2	55.2	44.5	63.9	58.0	56.5	69.4	69.4	67.3
	1997	54.6	46.8	44.7	58.3	48.7	46.9	62.1	54.2	45.8	56.5	69.8	64.2
United Kingdom	1990	54.3	50.5	38.4	57.0	57.6	41.5	59.7	55.3	50.8	66.2	68.1	75.4
	1997	50.0	40.3	37.3	53.8	52.5	36.7	57.6	49.9	40.8	58.8	66.1	67.8
Germany	1990	51.8	50.3	42.2	53.5	49.7	38.6	56.2	52.3	47.0	66.7	66.4	63.2
	1997	48.7	41.8	40.9	50.8	48.1	37.3	56.0	49.0	37.1	58.2	55.2	54.4
France	1990	52.7	49.9	41.0	55.9	50.8	38.6	57.8	53.2	49.4	58.8	64.1	72.1
	1997	47.2	38.2	36.0	50.5	47.7	37.9	54.7	48.1	38.2	49.8	57.4	60.6
Canada	1990	59.0	49.2	48.1	59.6	53.4	56.3	60.9	59.1	56.2	77.5	76.4	84.5
	1997	55.3	43.9	42.0	55.4	55.1	49.9	59.7	55.3	47.4	70.8	71.7	78.2
Russia	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	39.0	35.2	33.4	47.4	39.4	33.6	49.2	42.9	34.5	49.1	66.7	69.2
Italy	1990	48.7	42.9	37.5	49.8	46.9	38.4	54.5	50.7	45.0	59.0	53.9	53.2
	1997	45.4	36.6	33.6	49.8	44.4	36.2	53.6	46.3	44.2	51.3	58.9	58.0
Australia	1990	51.7	44.8	41.0	54.1	50.3	48.5	54.8	51.3	48.4	65.6	60.5	66.6
	1997	47.4	39.1	35.4	49.6	40.3	40.5	52.8	47.4	38.5	58.3	58.3	63.2
Netherlands	1990	49.5	46.4	41.2	45.9	46.3	38.1	53.9	49.8	46.0	59.7	59.6	63.9
	1997	46.1	39.9	36.0	46.9	45.3	33.8	50.7	46.4	41.0	63.0	60.0	60.4
Sweden	1990	48.7	44.9	36.6	48.3	44.4	41.1	53.5	48.1	45.8	52.4	69.3	63.6
	1997	44.9	33.4	39.6	44.8	41.1	35.0	51.9	44.8	36.9	44.1	54.4	53.6
Denmark	1990	45.1	43.5	40.2	51.6	40.0	34.7	49.0	43.8	43.4	49.1	49.2	84.6
	1997	41.2	34.7	37.4	46.3	48.4	31.7	47.7	39.8	42.6	34.2	52.0	59.4
Finland	1990	48.3	42.7	35.3	35.2	37.5	35.5	55.6	48.2	50.0	53.4	54.2	64.8
	1997	44.6	36.9	32.6	43.5	53.2	32.2	52.4	44.7	37.1	50.4	55.6	55.2
Norway	1990	47.2	43.8	34.1	41.2	57.4	32.8	53.6	47.7	48.0	55.4	51.7	52.9
	1997	40.4	34.0	30.3	35.7	51.8	28.4	47.1	40.8	43.4	42.9	53.7	47.1
Switzerland	1990	51.5	47.6	37.5	52.1	41.4	43.6	58.0	50.4	48.8	53.5	65.8	70.2
	1997	47.2	39.5	34.2	45.9	44.8	39.0	55.4	47.4	32.3	44.4	57.5	64.5
Belgium	1990	47.2	38.8	40.4	43.8	54.0	36.6	50.0	48.8	51.6	54.5	59.0	62.3
	1997	42.4	32.1	31.9	39.2	46.5	32.7	46.8	44.8	44.4	48.2	47.8	50.4
Austria	1990	47.4	43.7	35.2	40.1	43.2	31.5	52.7	47.8	47.5	37.3	48.1	100.0
	1997	43.6	36.3	31.9	34.2	39.4	35.9	51.0	44.1	30.3	45.1	62.2	41.2
Ireland	1990	39.5	41.6	31.1	30.4	54.2	33.7	44.5	40.0	25.8	68.8	65.2	54.5
	1997	38.2	34.8	26.4	43.1	22.2	26.6	42.9	40.4	31.7	62.2	46.2	63.6
Spain	1990	44.9	44.4	33.9	46.5	41.0	38.2	48.7	48.8	44.0	57.1	72.7	51.0
	1997	41.1	34.3	31.0	42.8	42.4	33.0	49.2	45.1	36.0	51.8	60.7	61.5

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-63.
Citations to U.S. literature in scientific and technical journals for selected countries, by field: 1990 and 1997
(Percentages of all citations to foreign sources)

Citing country	Citing year	Field											
		All fields	Physics	Chemistry	Earth/space sciences	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering technology	Psychology	Social sciences	Health professional
U.S. percentage of world articles													
U.S. articles as pct. of world's total	1990	38.2	29.8	22.7	41.4	39.9	37.4	38.4	40.2	37.8	61.3	54.7	72.1
	1997	35.3	25.4	21.9	39.0	36.4	32.7	39.1	38.0	33.6	56.5	51.5	66.9
U.S. percentage of countries' citations to foreign articles													
Greece	1990	43.7	43.3	35.9	39.8	51.3	33.9	50.0	46.0	44.4	44.4	51.9	77.8
	1997	39.6	32.3	32.6	41.8	36.7	30.4	50.2	42.2	45.0	55.6	56.2	33.3
Turkey	1990	45.7	46.7	29.4	42.1	55.6	47.1	42.6	51.9	43.2	63.3	58.8	66.7
	1997	36.1	29.7	24.3	31.5	50.0	32.3	39.9	39.8	39.7	60.0	55.9	68.0
Portugal	1990	36.0	35.8	29.9	46.8	42.1	29.1	37.6	34.9	50.0	66.7	71.4	50.0
	1997	34.5	35.1	29.9	40.8	22.2	22.0	39.3	36.8	31.7	42.9	43.8	50.0
Yugoslavia	1990	42.9	41.7	34.7	48.0	62.5	45.2	45.8	46.0	38.3	64.7	22.2	18.2
	1997	38.5	36.0	33.3	37.5	50.0	40.0	47.3	38.1	43.0	46.7	NA	100.0
Croatia	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	36.8	34.0	35.2	31.6	63.6	21.4	37.1	38.2	26.9	72.7	100.0	46.2
Slovenia	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	35.1	32.6	37.7	44.2	42.9	31.8	29.4	39.0	35.0	80.0	0.0	37.5
Poland	1990	38.7	38.4	31.1	48.1	42.9	30.6	43.4	42.1	37.2	55.0	72.7	40.0
	1997	33.4	28.1	27.3	37.4	43.8	27.6	42.7	41.4	30.4	38.2	66.7	75.0
Czechoslovakia	1990	38.9	39.8	32.7	37.0	45.0	28.8	41.4	44.4	34.9	57.1	66.7	33.3
	1997	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Czech Republic	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	33.4	24.7	25.7	38.6	22.5	25.8	41.1	39.8	21.5	22.4	53.6	100.0
Slovakia	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	30.9	25.2	24.9	26.7	43.8	26.8	33.2	39.1	33.3	46.7	50.0	NA
Hungary	1990	42.1	38.8	30.4	38.9	42.3	33.3	49.2	46.7	36.1	33.3	60.0	40.0
	1997	38.6	34.2	30.3	33.6	53.8	30.7	47.0	41.7	36.6	35.5	50.0	66.7
Bulgaria	1990	34.0	36.4	22.4	39.6	44.4	36.2	39.6	38.4	19.2	100.0	0.0	0.0
	1997	31.9	33.8	24.4	35.5	47.1	17.9	42.5	34.0	19.0	16.7	14.3	50.0
Romania	1990	37.0	41.5	27.9	33.3	23.8	30.0	45.7	37.8	25.0	NA	NA	0.0
	1997	30.0	28.4	23.8	34.5	35.0	33.3	47.9	32.5	27.4	NA	50.0	NA
India	1990	43.6	46.6	35.8	50.7	58.8	35.6	48.1	45.3	36.5	68.9	51.3	36.8
	1997	41.1	39.2	33.9	52.3	42.0	32.0	49.1	45.5	37.4	43.3	59.0	63.4
China	1990	47.0	48.2	38.7	50.8	50.0	43.5	53.6	45.9	47.6	53.8	75.0	40.0
	1997	40.4	39.4	34.3	48.4	36.2	31.4	52.6	46.3	37.8	55.6	60.9	42.0
Taiwan	1990	51.6	50.0	43.4	42.4	77.4	47.1	60.2	49.2	56.4	65.0	78.9	50.0
	1997	46.6	47.0	40.5	55.3	59.7	44.9	50.7	44.8	46.3	66.7	67.2	57.4
South Korea	1990	52.2	53.3	48.3	47.9	58.1	41.4	53.6	57.3	49.5	75.0	92.3	88.9
	1997	46.9	44.6	41.7	53.4	57.5	46.9	54.7	46.0	45.4	83.3	52.3	69.7
Hong Kong	1990	42.4	56.9	40.9	46.9	41.7	33.8	45.5	39.5	43.8	61.0	65.2	54.5
	1997	40.4	39.6	32.9	49.0	48.0	33.2	47.1	38.9	40.8	67.9	64.5	67.9
Singapore	1990	40.3	34.6	45.4	36.4	40.0	40.5	46.0	34.2	40.6	66.7	42.9	80.0
	1997	42.6	35.8	35.5	21.7	60.0	33.6	49.5	44.4	39.0	73.3	53.7	72.7

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-63.
Citations to U.S. literature in scientific and technical journals for selected countries, by field: 1990 and 1997
(Percentages of all citations to foreign sources)

Citing country	Citing year	Field											
		All fields	Physics	Chemistry	Earth/space sciences	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering technology	Psychology	Social sciences	Health professional
		U.S. percentage of world articles											
U.S. articles as pct.	1990	38.2	29.8	22.7	41.4	39.9	37.4	38.4	40.2	37.8	61.3	54.7	72.1
of world's total	1997	35.3	25.4	21.9	39.0	36.4	32.7	39.1	38.0	33.6	56.5	51.5	66.9
		U.S. percentage of countries' citations to foreign articles											
Thailand	1990	44.6	48.0	54.8	50.0	100.0	39.1	43.2	38.5	36.4	NA	53.8	45.5
	1997	37.4	38.8	26.2	48.1	NA	31.4	39.7	38.4	27.6	66.7	80.0	55.6
Malaysia	1990	39.4	28.0	32.8	14.3	20.0	36.8	47.1	43.2	27.3	NA	80.0	50.0
	1997	27.0	20.0	20.8	40.0	NA	23.6	33.8	26.6	17.4	50.0	100.0	33.3
Pakistan	1990	31.5	36.1	15.6	18.5	0.0	34.0	37.5	31.9	16.7	NA	66.7	66.7
	1997	31.9	28.6	12.0	40.0	0.0	38.5	38.3	36.6	37.5	100.0	60.0	42.9
Philippines	1990	38.5	50.0	0.0	68.8	NA	28.6	33.3	45.3	NA	100.0	87.5	100.0
	1997	42.6	50.0	75.0	40.0	NA	33.8	52.4	41.5	100.0	50.0	50.0	0.0
Bangladesh	1990	39.2	37.5	20.0	33.3	NA	8.3	46.7	52.8	0.0	0.0	60.0	NA
	1997	36.4	30.9	30.0	44.4	100.0	13.3	43.9	39.0	40.0	NA	44.4	50.0
New Zealand	1990	43.9	45.3	36.8	43.1	65.0	37.5	48.6	43.3	42.9	67.5	38.8	61.5
	1997	44.3	40.4	29.9	44.6	39.5	41.1	47.8	43.7	43.6	62.0	55.1	63.7
USSR	1990	45.1	45.4	34.3	52.6	47.7	36.3	48.9	46.6	37.1	54.3	41.2	56.3
	1997	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ukraine	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	32.0	32.4	22.4	34.1	35.0	31.0	42.3	36.5	24.3	0.0	NA	100.0
Belarus	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	32.2	30.4	26.5	40.9	50.0	26.5	45.9	40.3	20.4	NA	NA	0.0
Uzbekistan	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	27.2	19.8	11.8	57.1	0.0	66.7	29.8	46.2	0.0	NA	NA	NA
Estonia	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	30.8	25.1	22.5	22.0	33.3	26.0	42.8	31.5	36.0	46.2	100.0	33.3
Latvia	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	30.3	22.5	21.8	12.5	100.0	50.0	40.0	42.9	43.8	0.0	NA	NA
Lithuania	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	29.3	26.7	21.3	47.1	66.7	0.0	34.4	36.2	25.0	NA	NA	0.0
Armenia	1990	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1997	36.1	33.1	50.0	50.0	NA	NA	36.8	37.0	50.0	NA	NA	NA
Brazil	1990	48.0	42.7	37.0	51.1	62.2	48.3	49.6	51.1	44.3	51.9	76.9	53.3
	1997	40.7	34.7	26.4	47.2	47.8	36.5	48.1	44.3	36.7	53.2	79.5	52.4
Argentina	1990	47.8	45.2	31.7	47.5	60.0	44.1	51.3	53.8	47.2	66.7	68.8	NA
	1997	42.5	40.4	26.9	49.0	37.1	38.8	48.5	44.7	38.8	54.1	16.7	0.0
Mexico	1990	51.2	47.8	41.7	54.8	29.6	50.3	49.5	53.9	56.6	79.1	60.0	85.7
	1997	42.2	33.2	28.8	51.1	34.8	42.2	44.9	48.4	32.6	64.6	80.0	56.3
Chile	1990	50.9	49.6	23.0	55.6	46.2	47.0	53.5	53.9	42.1	0.0	71.4	62.5
	1997	43.8	33.3	26.6	48.7	52.6	41.8	47.6	45.5	32.7	60.0	83.3	65.2
Venezuela	1990	48.9	45.8	42.7	62.0	20.0	46.8	47.1	53.8	50.0	37.5	40.0	20.0
	1997	39.8	34.1	30.5	47.8	53.8	43.9	41.7	45.9	19.0	37.5	50.0	50.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-63.
Citations to U.S. literature in scientific and technical journals for selected countries, by field: 1990 and 1997
(Percentages of all citations to foreign sources)

Citing country	Citing year	Field											
		All fields	Physics	Chemistry	Earth/space sciences	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering technology	Psychology	Social sciences	Health professional
U.S. percentage of world articles													
U.S. articles as pct. of world's total	1990	38.2	29.8	22.7	41.4	39.9	37.4	38.4	40.2	37.8	61.3	54.7	72.1
	1997	35.3	25.4	21.9	39.0	36.4	32.7	39.1	38.0	33.6	56.5	51.5	66.9
U.S. percentage of countries' citations to foreign articles													
Colombia	1990	42.4	29.2	42.9	56.3	100.0	29.5	45.5	44.6	38.5	50.0	80.0	50.0
	1997	39.6	28.2	28.9	51.2	33.3	39.6	39.5	40.9	66.7	66.7	70.0	83.3
Cuba	1990	35.2	32.9	33.3	0.0	0.0	30.0	41.2	44.4	33.3	NA	NA	0.0
	1997	36.0	28.6	22.9	50.0	NA	35.3	38.5	44.3	20.0	57.1	0.0	NA
Israel	1990	59.1	61.1	48.6	61.3	61.0	49.3	59.8	58.5	63.6	74.3	73.7	78.2
	1997	52.7	44.8	40.6	61.0	59.2	41.5	58.6	52.4	50.5	67.3	74.3	70.3
Saudi Arabia	1990	45.2	37.8	42.4	32.4	16.7	22.9	47.7	49.1	43.1	NA	66.7	83.3
	1997	38.2	32.7	24.3	38.5	33.3	20.0	44.0	41.5	35.5	0.0	0.0	53.8
Iran	1990	43.8	80.0	46.2	60.0	0.0	60.0	27.3	29.7	33.3	100.0	100.0	0.0
	1997	31.6	35.2	23.0	15.8	0.0	38.9	43.8	36.1	18.2	100.0	100.0	50.0
Jordan	1990	36.6	12.2	40.7	20.0	NA	61.1	42.2	36.5	43.5	33.3	50.0	100.0
	1997	36.5	30.2	26.2	25.0	0.0	28.6	31.8	47.7	50.0	100.0	33.3	50.0
Kuwait	1990	46.7	50.0	43.9	83.3	100.0	19.1	56.3	40.9	48.7	50.0	100.0	71.4
	1997	34.7	36.8	13.8	54.5	50.0	32.4	42.9	38.5	31.0	40.0	50.0	100.0
South Africa	1990	45.0	44.6	32.5	48.3	52.0	38.5	49.8	45.1	43.9	61.5	51.6	57.4
	1997	39.1	26.7	26.6	39.2	62.5	33.4	45.0	42.9	43.5	66.0	37.7	50.0
Egypt	1990	37.0	41.0	19.8	35.1	0.0	35.4	45.1	44.3	36.5	66.7	100.0	66.7
	1997	30.2	26.2	19.8	28.6	66.7	29.4	35.4	38.1	22.4	50.0	50.0	52.6
Nigeria	1990	36.1	27.3	26.3	37.5	100.0	30.5	29.5	36.7	29.4	0.0	68.8	73.1
	1997	33.5	25.0	15.0	20.8	0.0	34.5	33.3	37.1	50.0	50.0	40.0	75.0
Kenya	1990	42.7	0.0	30.0	20.0	NA	31.0	48.2	43.1	NA	100.0	58.3	100.0
	1997	34.8	0.0	0.0	47.1	100.0	28.1	35.7	33.1	100.0	50.0	66.7	50.0
Morocco	1990	29.2	15.4	29.3	25.0	25.0	34.8	33.3	33.3	30.0	NA	NA	NA
	1997	22.7	14.8	21.1	31.6	25.0	29.7	31.7	34.1	11.4	0.0	NA	NA
Algeria	1990	27.7	28.6	21.1	10.0	50.0	28.6	35.3	35.0	22.2	0.0	NA	NA
	1997	22.0	21.7	20.0	0.0	0.0	40.0	30.0	25.0	25.0	NA	NA	0.0
Tunisia	1990	33.3	40.9	23.9	25.0	0.0	50.0	43.2	33.3	NA	100.0	NA	NA
	1997	24.8	18.8	11.4	17.6	20.0	23.7	35.5	27.5	38.1	NA	100.0	75.0

NA = not appropriate: either no citations or not in existence in year indicated

NOTE: Citations are to three years' articles with two-year lag; for example, 1997 citation counts are to articles published in 1993–95.

SOURCE: Institute for Scientific Information, Science Citation and Social Science Citation Indexes; CHI Research, Inc., Science Indicators database; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See page 6-53 in Volume 1.

Appendix table 6-64.
Citations on U.S. patents to the U.S. scientific and technical literature, by cited field and sector: 1987–98
(Number of citations)

Citing year	Total	Physics	Chemistry	Earth/ space	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering/ technology	Psychology	Social sciences	Health/ professional
All U.S. sectors												
1987	8,618	1,286	1,181	105	0	168	2,390	2,221	1,242	21	1	1
1988	9,498	1,595	1,212	81	2	220	2,749	2,423	1,209	3	0	2
1989	12,988	2,356	1,536	119	2	304	3,976	3,190	1,458	38	2	4
1990	12,936	2,169	1,673	76	3	306	3,818	3,415	1,443	30	0	1
1991	15,720	2,424	1,921	123	2	437	5,199	4,205	1,401	2	0	2
1992	19,425	2,667	2,451	94	18	436	6,945	5,293	1,492	24	1	1
1993	26,721	3,024	3,027	93	21	548	10,735	7,393	1,850	26	0	0
1994	27,437	3,589	3,114	122	14	677	10,332	7,215	2,346	15	0	10
1995	32,536	3,366	3,689	134	19	812	12,719	9,173	2,593	25	0	2
1996	47,142	3,506	4,535	195	25	1,349	20,646	13,637	3,207	11	1	24
1997	74,839	4,150	6,218	207	30	1,508	36,397	22,649	3,589	52	0	33
1998	108,335	4,719	6,900	285	35	2,426	55,891	33,437	4,452	91	10	88
Academic institutions												
1987	4,129	367	685	42	0	103	1,393	1,190	327	16	1	0
1988	4,696	465	703	40	1	148	1,654	1,309	372	1	0	0
1989	6,487	761	844	39	0	211	2,363	1,721	515	27	1	2
1990	6,461	727	939	30	2	201	2,218	1,853	463	25	0	0
1991	7,959	848	1,084	60	1	268	2,981	2,265	445	2	0	1
1992	10,003	905	1,513	49	8	294	3,826	2,854	526	23	1	1
1993	14,192	1,103	1,912	38	11	359	6,070	3,968	709	18	0	0
1994	14,546	1,258	1,968	53	11	455	5,850	3,985	946	11	0	4
1995	17,611	1,244	2,425	63	12	531	7,086	5,112	1,111	22	0	1
1996	25,857	1,386	2,953	102	14	926	11,575	7,459	1,418	8	1	10
1997	40,556	1,703	3,925	101	21	1,003	19,964	12,180	1,611	30	0	13
1998	58,737	1,934	4,255	161	22	1,556	30,462	18,160	2,069	59	3	54
Industry												
1987	2,302	662	347	27	0	16	262	271	712	2	0	0
1988	2,467	804	353	16	1	22	323	254	690	1	0	0
1989	3,371	1,186	508	56	2	25	479	340	766	5	0	1
1990	3,448	1,068	571	27	0	30	558	408	783	0	0	0
1991	3,914	1,133	613	27	1	51	820	511	756	0	0	0
1992	4,552	1,294	683	25	7	53	1,052	664	769	1	0	0
1993	5,883	1,391	792	29	8	58	1,689	1,027	884	0	0	0
1994	6,443	1,710	839	36	1	94	1,713	936	1,109	0	0	1
1995	7,254	1,598	862	32	3	120	2,181	1,246	1,206	2	0	0
1996	9,730	1,640	1,099	57	9	181	3,398	1,864	1,477	0	0	0
1997	14,809	1,764	1,653	57	7	203	6,048	3,437	1,634	2	0	0
1998	20,693	2,086	1,822	61	9	391	9,489	4,862	1,939	10	2	16

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-64.
Citations on U.S. patents to the U.S. scientific and technical literature, by cited field and sector: 1987–98
(Number of citations)

Citing year	Total	Physics	Chemistry	Earth/ space	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering/ technology	Psychology	Social sciences	Health/ professional
Federal Government												
1987	867	89	63	18	0	42	269	304	78	2	0	0
1988	961	128	70	12	0	42	303	326	77	0	0	0
1989	1,254	151	87	11	0	51	448	428	73	1	1	0
1990	1,188	154	56	9	0	64	405	422	76	0	0	0
1991	1,468	143	78	19	0	76	531	541	77	0	0	1
1992	1,898	151	105	8	2	63	862	642	62	0	0	0
1993	2,696	195	130	7	0	110	1,166	975	103	6	0	0
1994	2,522	200	98	16	0	96	1,087	906	113	3	0	0
1995	3,014	186	124	23	1	125	1,339	1,108	103	1	0	1
1996	4,471	162	165	18	1	181	2,140	1,672	123	0	0	5
1997	7,461	253	243	21	1	202	3,855	2,777	100	3	0	4
1998	11,156	235	314	30	0	310	6,051	4,070	126	7	2	5
Federally funded R&D centers (FFRDCs)												
1987	325	147	40	11	0	1	24	26	73	0	0	0
1988	340	179	46	5	0	0	44	18	46	0	0	0
1989	426	203	45	1	0	0	64	34	76	0	0	0
1990	418	189	50	4	1	1	55	27	88	0	0	0
1991	547	256	65	6	0	4	86	39	88	0	0	0
1992	592	257	88	6	1	1	110	41	85	0	0	0
1993	677	281	100	8	2	0	124	49	110	0	0	0
1994	808	338	114	4	1	4	150	74	121	0	0	0
1995	799	270	124	10	3	3	195	86	105	0	0	0
1996	960	264	139	10	0	9	307	114	114	0	0	0
1997	1,349	318	174	12	0	13	480	194	154	0	0	0
1998	1,831	372	217	14	0	17	797	250	160	0	0	0
Nonprofit institutions												
1987	873	14	43	1	0	3	396	371	41	1	0	1
1988	908	13	34	1	0	5	375	457	19	0	0	2
1989	1,245	44	46	3	0	11	544	575	17	3	0	0
1990	1,243	25	50	4	0	5	517	618	19	3	0	0
1991	1,582	30	76	7	0	13	689	742	23	0	0	0
1992	2,069	46	57	1	0	11	967	948	36	0	0	0
1993	2,875	39	85	4	0	12	1,512	1,188	32	0	0	0
1994	2,727	73	84	4	0	19	1,372	1,131	42	0	0	0
1995	3,387	53	130	1	0	24	1,754	1,386	37	0	0	0
1996	5,367	45	153	6	1	36	2,908	2,171	42	1	0	2
1997	9,501	97	196	7	0	75	5,531	3,521	52	14	0	5
1998	14,183	70	263	5	1	125	8,317	5,293	93	8	2	5

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-64.
Citations on U.S. patents to the U.S. scientific and technical literature, by cited field and sector: 1987–98
(Number of citations)

Citing year	Total	Physics	Chemistry	Earth/ space	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering/ technology	Psychology	Social sciences	Health/ professional
State and local governments												
1987	82	2	0	3	0	0	34	41	0	0	0	0
1988	86	0	0	3	0	1	42	40	0	0	0	0
1989	115	0	3	5	0	2	49	50	4	0	0	0
1990	107	0	2	0	0	1	42	61	0	0	0	0
1991	157	0	3	2	0	22	59	69	0	0	0	0
1992	205	0	1	2	0	6	88	106	0	0	0	0
1993	248	0	0	3	0	6	112	124	0	2	0	0
1994	238	0	3	4	0	4	98	123	0	1	0	4
1995	241	0	1	1	0	5	96	136	0	0	0	0
1996	402	0	8	0	0	5	162	220	0	1	0	4
1997	597	0	10	4	0	5	270	296	1	1	0	7
1998	859	0	9	4	0	16	390	432	2	3	0	1
Unknown sector												
1987	38	3	2	0	0	0	8	14	9	0	0	0
1988	37	4	3	2	0	1	6	17	3	0	0	0
1989	87	8	1	2	0	2	26	40	6	2	0	0
1990	69	3	2	0	0	2	20	25	12	2	0	0
1991	89	11	0	0	0	1	31	35	10	0	0	0
1992	103	10	2	1	0	5	37	36	11	0	0	0
1993	147	11	7	2	0	0	58	59	8	0	0	0
1994	149	7	5	2	0	3	60	57	12	0	0	0
1995	227	10	20	2	0	1	67	96	29	0	0	0
1996	352	6	15	0	0	9	153	133	31	0	0	2
1997	564	13	15	3	0	4	246	242	36	0	0	2
1998	874	19	18	6	1	9	383	367	61	2	0	5

NOTES: Citations to articles with authors in different sectors are assigned fractionally to participating sectors. Citations are to articles published in a 12-year period, lagged by 3 years from the patent data; for example, 1987 citations are to articles published in 1973–84.

SOURCES: Institute for Scientific Information, Science and Social Science Citation Indexes; CHI Research, Inc., Science Indicators database; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See figure 6-41 and text table 6-10 in Volume 1.

Appendix table 6-65.
Distribution of citations on U.S. patents to the U.S. scientific and technical literature, by field across sectors: 1987–98
(Percentages)

Citing year	Total	Physics	Chemistry	Earth/ space	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering/ technology	Psychology	Social sciences	Health/ professional
All U.S. sectors												
Each year, 1987–98	100	100	100	100	100	100	100	100	100	100	100	100
Academic institutions												
1987	48	29	58	40	—	61	58	54	26	76	100	0
1988	49	29	58	49	50	67	60	54	31	33	—	0
1989	50	32	55	33	0	69	59	54	35	71	50	50
1990	50	34	56	39	67	66	58	54	32	83	—	0
1991	51	35	56	49	50	61	57	54	32	100	—	50
1992	51	34	62	52	44	67	55	54	35	96	100	100
1993	53	36	63	41	52	66	57	54	38	69	—	—
1994	53	35	63	43	79	67	57	55	40	73	—	40
1995	54	37	66	47	63	65	56	56	43	88	—	50
1996	55	40	65	52	56	69	56	55	44	73	100	42
1997	54	41	63	49	70	67	55	54	45	58	—	39
1998	54	41	62	56	63	64	55	54	46	65	30	61
Industry												
1987	27	51	29	26	—	10	11	12	57	10	0	0
1988	26	50	29	20	50	10	12	10	57	33	—	0
1989	26	50	33	47	100	8	12	11	53	13	0	25
1990	27	49	34	36	0	10	15	12	54	0	—	0
1991	25	47	32	22	50	12	16	12	54	0	—	0
1992	23	49	28	27	39	12	15	13	52	4	0	0
1993	22	46	26	31	38	11	16	14	48	0	—	—
1994	23	48	27	30	7	14	17	13	47	0	—	10
1995	22	47	23	24	16	15	17	14	47	8	—	0
1996	21	47	24	29	36	13	16	14	46	0	0	0
1997	20	43	27	28	23	13	17	15	46	4	—	0
1998	19	44	26	21	26	16	17	15	44	11	20	18
Federal Government												
1987	10	7	5	17	—	25	11	14	6	10	0	0
1988	10	8	6	15	0	19	11	13	6	0	—	0
1989	10	6	6	9	0	17	11	13	5	3	50	0
1990	9	7	3	12	0	21	11	12	5	0	—	0
1991	9	6	4	15	0	17	10	13	5	0	—	50
1992	10	6	4	9	11	14	12	12	4	0	0	0
1993	10	6	4	8	0	20	11	13	6	23	—	—
1994	9	6	3	13	0	14	11	13	5	20	—	0
1995	9	6	3	17	5	15	11	12	4	4	—	50
1996	9	5	4	9	4	13	10	12	4	0	0	21
1997	10	6	4	10	3	13	11	12	3	6	—	12
1998	10	5	5	11	0	13	11	12	3	8	20	6

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-65.
Distribution of citations on U.S. patents to the U.S. scientific and technical literature, by field across sectors: 1987–98
(Percentages)

Citing year	Total	Physics	Chemistry	Earth/ space	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering/ technology	Psychology	Social sciences	Health/ professional
Federally funded R&D centers (FFRDCs)												
1987	4	11	3	10	—	1	1	1	6	0	0	0
1988	4	11	4	6	0	0	2	1	4	0	—	0
1989	3	9	3	1	0	0	2	1	5	0	0	0
1990	3	9	3	5	33	0	1	1	6	0	—	0
1991	3	11	3	5	0	1	2	1	6	0	—	0
1992	3	10	4	6	6	0	2	1	6	0	0	0
1993	3	9	3	9	10	0	1	1	6	0	—	—
1994	3	9	4	3	7	1	1	1	5	0	—	0
1995	2	8	3	7	16	0	2	1	4	0	—	0
1996	2	8	3	5	0	1	1	1	4	0	0	0
1997	2	8	3	6	0	1	1	1	4	0	—	0
1998	2	8	3	5	0	1	1	1	4	0	0	0
Nonprofit institutions												
1987	10	1	4	1	—	2	17	17	3	5	0	100
1988	10	1	3	1	0	2	14	19	2	0	—	100
1989	10	2	3	3	0	4	14	18	1	8	0	0
1990	10	1	3	5	0	2	14	18	1	10	—	0
1991	10	1	4	6	0	3	13	18	2	0	—	0
1992	11	2	2	1	0	3	14	18	2	0	0	0
1993	11	1	3	4	0	2	14	16	2	0	—	—
1994	10	2	3	3	0	3	13	16	2	0	—	0
1995	10	2	4	1	0	3	14	15	1	0	—	0
1996	11	1	3	3	4	3	14	16	1	9	0	8
1997	13	2	3	3	0	5	15	16	1	27	—	15
1998	13	1	4	2	3	5	15	16	2	9	20	6
State and local governments												
1987	1	0	0	3	—	0	1	2	0	0	0	0
1988	1	0	0	4	0	0	2	2	0	0	—	0
1989	1	0	0	4	0	1	1	2	0	0	0	0
1990	1	0	0	0	0	0	1	2	0	0	—	0
1991	1	0	0	2	0	5	1	2	0	0	—	0
1992	1	0	0	2	0	1	1	2	0	0	0	0
1993	1	0	0	3	0	1	1	2	0	8	—	—
1994	1	0	0	3	0	1	1	2	0	7	—	40
1995	1	0	0	1	0	1	1	1	0	0	—	0
1996	1	0	0	0	0	0	1	2	0	9	0	17
1997	1	0	0	2	0	0	1	1	0	2	—	21
1998	1	0	0	1	0	1	1	1	0	3	0	1

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-65.
Distribution of citations on U.S. patents to the U.S. scientific and technical literature, by field across sectors: 1987–98
(Percentages)

Citing year	Total	Physics	Chemistry	Earth/ space	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering/ technology	Psychology	Social sciences	Health/ professional
						Unknown sector						
1987	0	0	0	0	—	0	0	1	1	0	0	0
1988	0	0	0	2	0	0	0	1	0	0	—	0
1989	1	0	0	2	0	1	1	1	0	5	0	0
1990	1	0	0	0	0	1	1	1	1	7	—	0
1991	1	0	0	0	0	0	1	1	1	0	—	0
1992	1	0	0	1	0	1	1	1	1	0	0	0
1993	1	0	0	2	0	0	1	1	0	0	—	—
1994	1	0	0	2	0	0	1	1	1	0	—	0
1995	1	0	1	1	0	0	1	1	1	0	—	0
1996	1	0	0	0	0	1	1	1	1	0	0	8
1997	1	0	0	1	0	0	1	1	1	0	—	6
1998	1	0	0	2	3	0	1	1	1	2	0	6

— = no citations

NOTES: Citations to articles with authors in different sectors are assigned fractionally to participating sectors. Citations are to articles published in a 12-year period, lagged by 3 years from the patent data; for example, 1987 citations are to articles published in 1973-84.

SOURCES: Institute for Scientific Information, Science and Social Science Citation Indexes; CHI Research, Inc., Science Indicators database; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See page 6-55 in Volume 1.

Appendix table 6-66.
Distribution of citations on U.S. patents to the U.S. scientific and technical literature, within sectors by field: 1987–98
(Percentages)

Citing year	Total	Physics	Chemistry	Earth/ space	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering/ technology	Psychology	Social sciences	Health/ professional
All U.S. sectors												
1987	100	15	14	1	0	2	28	26	14	0	0	0
1988	100	17	13	1	0	2	29	26	13	0	0	0
1989	100	18	12	1	0	2	31	25	11	0	0	0
1990	100	17	13	1	0	2	30	26	11	0	0	0
1991	100	15	12	1	0	3	33	27	9	0	0	0
1992	100	14	13	0	0	2	36	27	8	0	0	0
1993	100	11	11	0	0	2	40	28	7	0	0	0
1994	100	13	11	0	0	2	38	26	9	0	0	0
1995	100	10	11	0	0	2	39	28	8	0	0	0
1996	100	7	10	0	0	3	44	29	7	0	0	0
1997	100	6	8	0	0	2	49	30	5	0	0	0
1998	100	4	6	0	0	2	52	31	4	0	0	0
Academic institutions												
1987	100	9	17	1	0	2	34	29	8	0	0	0
1988	100	10	15	1	0	3	35	28	8	0	0	0
1989	100	12	13	1	0	3	36	27	8	0	0	0
1990	100	11	15	0	0	3	34	29	7	0	0	0
1991	100	11	14	1	0	3	37	28	6	0	0	0
1992	100	9	15	0	0	3	38	29	5	0	0	0
1993	100	8	13	0	0	3	43	28	5	0	0	0
1994	100	9	14	0	0	3	40	27	7	0	0	0
1995	100	7	14	0	0	3	40	29	6	0	0	0
1996	100	5	11	0	0	4	45	29	5	0	0	0
1997	100	4	10	0	0	2	49	30	4	0	0	0
1998	100	3	7	0	0	3	52	31	4	0	0	0
Industry												
1987	100	29	15	1	0	1	11	12	31	0	0	0
1988	100	33	14	1	0	1	13	10	28	0	0	0
1989	100	35	15	2	0	1	14	10	23	0	0	0
1990	100	31	17	1	0	1	16	12	23	0	0	0
1991	100	29	16	1	0	1	21	13	19	0	0	0
1992	100	28	15	1	0	1	23	15	17	0	0	0
1993	100	24	13	0	0	1	29	17	15	0	0	0
1994	100	27	13	1	0	1	27	15	17	0	0	0
1995	100	22	12	0	0	2	30	17	17	0	0	0
1996	100	17	11	1	0	2	35	19	15	0	0	0
1997	100	12	11	0	0	1	41	23	11	0	0	0
1998	100	10	9	0	0	2	46	23	9	0	0	0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-66.
Distribution of citations on U.S. patents to the U.S. scientific and technical literature, within sectors by field: 1987–98
(Percentages)

Citing year	Total	Physics	Chemistry	Earth/ space	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering/ technology	Psychology	Social sciences	Health/ professional
Federal Government												
1987	100	10	7	2	0	5	31	35	9	0	0	0
1988	100	13	7	1	0	4	32	34	8	0	0	0
1989	100	12	7	1	0	4	36	34	6	0	0	0
1990	100	13	5	1	0	5	34	36	6	0	0	0
1991	100	10	5	1	0	5	36	37	5	0	0	0
1992	100	8	6	0	0	3	45	34	3	0	0	0
1993	100	7	5	0	0	4	43	36	4	0	0	0
1994	100	8	4	1	0	4	43	36	4	0	0	0
1995	100	6	4	1	0	4	44	37	3	0	0	0
1996	100	4	4	0	0	4	48	37	3	0	0	0
1997	100	3	3	0	0	3	52	37	1	0	0	0
1998	100	2	3	0	0	3	54	36	1	0	0	0
Federally funded R&D centers (FFRDCs)												
1987	100	45	12	3	0	0	7	8	22	0	0	0
1988	100	53	14	1	0	0	13	5	14	0	0	0
1989	100	48	11	0	0	0	15	8	18	0	0	0
1990	100	45	12	1	0	0	13	6	21	0	0	0
1991	100	47	12	1	0	1	16	7	16	0	0	0
1992	100	43	15	1	0	0	19	7	14	0	0	0
1993	100	42	15	1	0	0	18	7	16	0	0	0
1994	100	42	14	0	0	0	19	9	15	0	0	0
1995	100	34	16	1	0	0	24	11	13	0	0	0
1996	100	28	14	1	0	1	32	12	12	0	0	0
1997	100	24	13	1	0	1	36	14	11	0	0	0
1998	100	20	12	1	0	1	44	14	9	0	0	0
Nonprofit institutions												
1987	100	2	5	0	0	0	45	42	5	0	0	0
1988	100	1	4	0	0	1	41	50	2	0	0	0
1989	100	4	4	0	0	1	44	46	1	0	0	0
1990	100	2	4	0	0	0	42	50	2	0	0	0
1991	100	2	5	0	0	1	44	47	1	0	0	0
1992	100	2	3	0	0	1	47	46	2	0	0	0
1993	100	1	3	0	0	0	53	41	1	0	0	0
1994	100	3	3	0	0	1	50	41	2	0	0	0
1995	100	2	4	0	0	1	52	41	1	0	0	0
1996	100	1	3	0	0	1	54	40	1	0	0	0
1997	100	1	2	0	0	1	58	37	1	0	0	0
1998	100	0	2	0	0	1	59	37	1	0	0	0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-66.
Distribution of citations on U.S. patents to the U.S. scientific and technical literature, within sectors by field: 1987–98
(Percentages)

Citing year	Total	Physics	Chemistry	Earth/ space	Mathematics	Biology	Biomedical research	Clinical medicine	Engineering/ technology	Psychology	Social sciences	Health/ professional
State and local governments												
1987	100	2	0	4	0	0	41	50	0	0	0	0
1988	100	0	0	3	0	1	49	47	0	0	0	0
1989	100	0	3	4	0	2	43	43	3	0	0	0
1990	100	0	2	0	0	1	39	57	0	0	0	0
1991	100	0	2	1	0	14	38	44	0	0	0	0
1992	100	0	0	1	0	3	43	52	0	0	0	0
1993	100	0	0	1	0	2	45	50	0	1	0	0
1994	100	0	1	2	0	2	41	52	0	0	0	2
1995	100	0	0	0	0	2	40	56	0	0	0	0
1996	100	0	2	0	0	1	40	55	0	0	0	1
1997	100	0	2	1	0	1	45	50	0	0	0	1
1998	100	0	1	0	0	2	45	50	0	0	0	0
Unknown sector												
1987	100	8	5	0	0	0	21	37	24	0	0	0
1988	100	11	8	5	0	3	16	46	8	0	0	0
1989	100	9	1	2	0	2	30	46	7	2	0	0
1990	100	4	3	0	0	3	29	36	17	3	0	0
1991	100	12	0	0	0	1	35	39	11	0	0	0
1992	100	10	2	1	0	5	36	35	11	0	0	0
1993	100	7	5	1	0	0	39	40	5	0	0	0
1994	100	5	3	1	0	2	40	38	8	0	0	0
1995	100	4	9	1	0	0	30	42	13	0	0	0
1996	100	2	4	0	0	3	43	38	9	0	0	1
1997	100	2	3	1	0	1	44	43	6	0	0	0
1998	100	2	2	1	0	1	44	42	7	0	0	1

NOTES: Citations to articles with authors in different sectors are assigned fractionally to participating sectors. Citations are to articles published in a 12-year period, lagged by 3 years from the patent data; for example, 1987 citations are to articles published in 1973-84.

SOURCES: Institute for Scientific Information, Science and Social Science Citation Indexes; CHI Research, Inc., Science Indicators database; and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See page 6-55 in Volume 1.

Appendix table 6-67.
U.S. patents awarded to U.S. universities with largest 1997 R&D volume and to other academic institutions: 1985–98

Institution	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Number of academic institutions awarded patents														
All academic institutions	111	119	122	120	147	145	152	150	159	166	164	176	172	173
Public	64	74	70	68	87	88	94	92	98	100	101	105	106	102
Private	47	45	52	52	60	57	58	58	61	66	63	71	66	71
Top 100 in 1997 R&D	71	72	80	75	81	85	84	85	86	88	88	88	87	88
Public	45	46	51	46	51	55	56	56	56	58	58	58	57	57
Private	26	26	29	29	30	30	28	29	30	30	30	30	30	31
Other universities and colleges	40	47	42	45	66	60	68	65	73	78	76	88	85	85
Public	19	28	19	22	36	33	38	36	42	42	43	47	49	45
Private	21	19	23	23	30	27	30	29	31	36	33	41	36	40
Number of patents awarded														
All academic institutions	589	670	819	814	1,228	1,183	1,342	1,542	1,620	1,780	1,879	2,154	2,436	3,151
Public	311	356	399	407	661	676	798	909	939	1,068	1,191	1,341	1,510	1,828
Private	232	262	363	368	526	479	511	599	648	677	654	774	880	1,278
Top 100 in 1997 R&D	453	515	677	667	1,019	996	1,123	1,304	1,367	1,501	1,590	1,850	2,105	2,789
Public	266	305	359	355	576	592	687	789	821	932	1,052	1,205	1,359	1,682
Private	187	210	318	312	443	404	436	515	546	569	538	645	746	1,107
Other universities and colleges	90	103	85	108	168	159	186	204	220	244	255	265	285	317
Public	45	51	40	52	85	84	111	120	118	136	139	136	151	146
Private	45	52	45	56	83	75	75	84	102	108	116	129	134	171
Patents to top 100 (percent of total)	**76.9**	**76.9**	**82.7**	**81.9**	**83.0**	**84.2**	**83.7**	**84.6**	**84.4**	**84.3**	**84.6**	**85.9**	**86.4**	**88.5**
Number of patents awarded to private universities among top 100														
Massachusetts Institute of Technology	35	45	63	64	101	109	101	125	112	99	104	119	102	138
California Institute of Technology	16	23	27	18	56	30	36	32	29	46	38	24	46	93
Johns Hopkins University	15	18	18	21	27	15	25	20	33	23	28	27	48	79
Stanford University	38	33	48	54	43	36	57	42	50	62	54	55	64	79
University of Pennsylvania	5	1	2	1	9	19	18	26	34	37	25	45	55	69
Cornell University	20	13	30	16	22	34	40	41	35	39	36	52	50	65
Columbia University	4	7	6	15	19	16	8	17	17	18	18	33	35	55
Harvard University	1	2	9	17	15	23	9	16	17	16	14	32	28	49
Washington University	3	1	7	6	12	7	22	18	18	19	21	18	22	41
Emory University	1	1	0	0	7	3	10	6	14	5	11	12	12	35
Northwestern University	2	8	10	10	7	5	4	8	8	12	18	10	27	35
Rockefeller University	5	4	9	11	6	8	14	23	23	13	9	8	20	35
Yale University	5	3	12	6	11	10	4	12	14	13	16	7	20	34
Duke University	4	6	4	9	11	7	6	9	12	29	20	37	21	30
Baylor College of Medicine	2	2	7	3	7	8	4	6	9	9	4	15	15	27
Carnegie-Mellon University	3	3	1	2	5	3	5	10	4	8	10	13	9	26
Princeton University	0	0	2	1	12	4	13	4	11	7	12	13	16	24
New York University	5	3	5	4	10	14	8	11	19	16	15	19	23	23
University of Chicago	0	0	1	6	7	2	0	0	6	14	16	13	22	22

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-67.
U.S. patents awarded to U.S. universities with largest 1997 R&D volume and to other academic institutions: 1985–98

Institution	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Number of patents to awarded to private universities among top 100 (continued)														
Boston University	3	6	9	9	9	11	6	22	15	14	14	16	20	19
Mount Sinai School of Medicine	1	2	1	2	1	2	5	3	3	4	4	9	12	16
University of Southern California	5	5	4	7	8	6	5	18	13	15	6	15	18	16
Vanderbilt University	0	5	4	4	4	5	7	4	7	6	9	6	11	16
Case Western Reserve University	1	6	3	1	1	2	1	9	6	8	8	6	9	15
University of Rochester	2	8	9	11	11	13	12	10	11	10	6	3	5	15
Yeshiva University	4	1	6	1	5	1	0	1	4	3	3	11	6	14
Georgetown University	1	0	4	3	1	5	3	5	5	7	6	7	8	11
Tufts University	0	0	1	2	7	1	5	7	9	6	3	8	4	11
Tulane University	2	1	1	3	4	4	7	5	6	6	5	7	4	9
Allegheny University of the Health Sciences	0	0	0	0	0	0	0	0	0	0	0	0	0	3
University Of Miami	4	3	15	5	5	1	1	5	2	5	5	5	14	3
Number of patents awarded to public universities among top 100														
University of California	42	54	67	60	81	65	84	81	115	163	213	266	277	395
University of Texas	20	25	21	21	51	56	84	73	86	98	89	87	81	97
University of Wisconsin	17	17	11	20	27	15	44	42	56	48	47	64	62	83
Michigan State University	3	10	6	8	2	7	11	19	13	21	15	32	41	59
Iowa State University	21	9	15	15	28	30	39	23	29	37	37	38	36	53
University of Florida	7	10	13	21	33	33	38	42	34	26	31	36	43	52
State University of New York	5	11	18	10	25	20	27	34	30	37	31	37	45	51
University of Michigan	1	10	6	14	23	27	21	21	19	28	30	25	53	50
University of Washington	1	2	1	5	3	7	8	11	11	12	17	25	37	47
University of Minnesota	11	16	28	26	40	38	32	31	28	28	25	31	32	43
Louisiana State University	1	1	3	4	9	4	5	20	16	11	14	16	22	38
University of Utah	11	7	12	9	13	14	5	13	20	22	17	32	31	37
University of Pittsburgh	3	8	10	6	11	11	16	10	10	10	13	12	17	32
University of North Carolina	0	3	2	2	6	8	3	11	14	13	21	22	39	29
University of Alabama	5	3	5	3	3	6	3	7	6	7	9	14	19	28
North Carolina State University	3	4	6	5	10	14	11	24	27	32	31	26	24	26
Pennsylvania State University	0	0	1	1	1	3	6	7	10	16	18	20	19	26
Rutgers University	1	0	2	2	7	2	15	12	15	18	20	18	21	26
University of Iowa	1	8	8	6	8	12	6	7	11	9	17	11	14	25
Ohio State University	12	5	13	14	13	10	15	21	10	10	17	22	27	24
University of Maryland	0	3	2	2	1	4	4	14	21	15	21	20	18	24
University of Nebraska	1	1	1	4	0	3	4	4	10	16	21	29	24	24
Purdue University	18	9	4	2	11	15	11	5	6	11	10	12	24	22
Texas A&M University	8	3	6	9	8	9	12	14	22	20	16	15	14	21
University of Illinois	10	12	4	9	15	7	8	10	13	14	12	16	17	21
University of Kentucky	5	7	4	7	6	4	7	7	4	3	11	14	14	21
University of Virginia	1	4	3	4	8	12	11	9	7	5	10	13	13	20

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-67.
U.S. patents awarded to U.S. universities with largest 1997 R&D volume and to other academic institutions: 1985–98

Institution	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Number of patents awarded to public universities among top 100 (continued)														
University of Colorado	0	0	1	0	4	9	6	19	7	14	18	16	21	19
Virginia Polytechnic Institute	0	0	0	3	10	7	13	19	13	16	7	17	21	19
University of Georgia	5	6	4	0	3	5	8	10	18	7	10	12	11	18
University of South Florida	0	1	0	0	2	2	7	5	7	4	6	13	14	18
Georgia Institute of Technology	11	9	9	7	8	18	11	16	16	20	21	22	16	17
University of Massachusetts	1	0	2	1	0	1	3	2	2	4	10	4	6	17
Univ. of Medicine & Dentistry, New Jersey	1	4	7	2	4	7	2	6	1	4	5	3	7	15
Florida State University	0	2	2	1	1	1	1	2	9	5	10	8	6	13
Oregon Health Sciences University	0	0	3	0	3	4	6	5	5	6	10	12	16	13
University of Missouri	0	3	8	9	5	6	7	9	8	7	10	8	16	13
Indiana University	4	0	3	1	6	1	3	6	1	7	6	8	11	12
University of New Mexico	2	3	1	3	9	9	10	11	5	9	15	8	13	12
University of Connecticut	1	1	2	1	2	8	3	9	9	2	8	9	13	11
Wayne State University	1	5	6	7	16	9	8	16	12	14	9	8	8	10
University of Oklahoma	5	2	2	6	4	7	4	7	14	8	11	9	16	9
University of Tennessee	5	8	8	8	12	14	10	12	4	5	14	8	13	9
Clemson University	2	1	3	3	6	6	2	10	4	10	8	7	9	8
Colorado State University	1	3	4	2	0	2	4	1	4	1	1	6	2	8
Oregon State University	5	4	2	3	6	2	7	11	5	13	6	5	10	8
University of Arizona	2	2	0	0	1	2	1	1	3	6	4	4	9	8
University of Massachusetts Medical School	0	0	0	0	3	2	3	3	2	1	2	10	9	7
Arizona State University	1	1	2	0	9	9	12	6	3	6	12	19	12	6
Auburn University	1	1	0	0	0	2	1	5	0	2	2	1	3	6
University of Hawaii	2	0	1	3	2	6	2	5	8	6	7	6	6	6
University of Kansas	1	0	2	0	1	3	4	7	3	2	2	6	3	6
University of Cincinnati	2	1	8	3	8	9	9	7	8	7	8	7	10	5
Utah State University	3	2	2	1	1	2	3	2	2	2	8	6	1	5
Washington State University	2	2	2	2	7	3	6	4	2	5	4	3	5	5
Mississippi State University	0	0	0	0	0	0	0	0	1	1	2	5	3	3
New Mexico State University	0	2	3	0	0	0	1	1	2	7	2	1	5	2
Univ. of Texas Health Science Ctr. Houston	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Univ. of Texas MD Anderson Cancer Center	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Univ. of Texas SW Medical Ctr. at Dallas	0	0	0	0	0	0	0	0	0	0	1	0	0	0

NOTE: The "top 100" institutions listed do not total 100 because a number of university systems are included which do not record patents for individual campuses. Ten unaffiliated entities holding academic patents are excluded from the institution counts, but their patents are included in the patent counts. For this reason, details may not add to totals.

SOURCES: U.S. Patent and Trademark Office, *Technology Assessment and Forecast Report, U.S. Universities and Colleges, 1969- 98* (Washington, DC: 1999); and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See figures 6-42 and 6-43 in Volume 1.

Appendix table 6-68.
Patents awarded to U.S. universities and colleges, by utility class and University Activity Index: 1969–98

Utility Class	Number of academic patents					Percent of academic patents					University Activity Index[a]
	1969–80	1981–85	1986–90	1991–95	1996–98	1969–80	1981–85	1986–90	1991–95	1996–98	
Total, all utility classes	3,439	2,468	4,715	8,163	7,741	100.0	100.0	100.0	100.0	100.0	—
435 Chemistry: molecular biology, microbiology	146	202	455	868	1,509	4.2	8.2	9.7	10.6	19.5	11.4
514 Drug, bio-affecting, body treating compositions	163	232	482	720	878	4.7	9.4	10.2	8.8	11.3	4.3
424 Drug, bio-affecting, body treating compositions	126	125	260	487	614	3.7	5.1	5.5	6.0	7.9	6.5
530 Chemistry: natural resins, derivatives	25	83	134	203	266	0.7	3.4	2.8	2.5	3.4	10.5
600 Surgery	100	79	161	290	185	2.9	3.2	3.4	3.6	2.4	4.6
536 Organic compounds (class 532–570 series)	44	35	63	163	175	1.3	1.4	1.3	2.0	2.3	7.5
800 Multicellular living organisms	4	5	5	34	151	0.1	0.2	0.1	0.4	2.0	14.0
250 Radiant energy	89	46	122	224	146	2.6	1.9	2.6	2.7	1.9	2.3
324 Electricity: measuring, testing	47	38	137	149	114	1.4	1.5	2.9	1.8	1.5	2.2
73 Measuring, testing	128	71	105	148	103	3.7	2.9	2.2	1.8	1.3	1.5
359 Optics: systems, elements	60	30	77	118	103	1.7	1.2	1.6	1.4	1.3	1.6
428 Stock material, misc. articles	28	32	48	89	86	0.8	1.3	1.0	1.1	1.1	0.6
257 Active solid-state devices	26	18	53	127	86	0.8	0.7	1.1	1.6	1.1	1.4
382 Image analysis	4	5	27	47	86	0.1	0.2	0.6	0.6	1.1	2.3
356 Optics: measuring, testing	42	31	89	97	83	1.2	1.3	1.9	1.2	1.1	2.1
436 Chemistry: analytical, immunological testing	74	67	60	107	80	2.2	2.7	1.3	1.3	1.0	5.6
606 Surgery	24	22	60	79	80	0.7	0.9	1.3	1.0	1.0	2.1
427 Coating processes	19	14	51	133	78	0.6	0.6	1.1	1.6	1.0	1.5
372 Coherent light generators	32	29	77	117	76	0.9	1.2	1.6	1.4	1.0	3.8
604 Surgery	18	36	81	118	67	0.5	1.5	1.7	1.4	0.9	1.7
364 Electrical computers, data processing systems	24	15	32	66	65	0.7	0.6	0.7	0.8	0.8	1.3
210 Liquid purification, separation	60	33	58	128	64	1.7	1.3	1.2	1.6	0.8	1.3
438 Semiconductor device manufacturing: process	14	29	56	86	62	0.4	1.2	1.2	1.1	0.8	1.2
204 Chemistry: electrical, wave energy	52	34	58	143	61	1.5	1.4	1.2	1.8	0.8	2.5
525 Synthetic resins, natural rubbers (class 520 series)	24	24	37	91	60	0.7	1.0	0.8	1.1	0.8	1.2
423 Chemistry of inorganic compounds	67	27	30	80	56	1.9	1.1	0.6	1.0	0.7	1.4
345 Computer graphics processing	13	3	16	38	53	0.4	0.1	0.3	0.5	0.7	0.9
426 Food, edible material: processes, compositions	63	39	36	74	53	1.8	1.6	0.8	0.9	0.7	1.5
549 Organic compounds (class 532–570 series)	36	37	40	73	52	1.0	1.5	0.8	0.9	0.7	2.5
395 Information processing system organization	10	9	26	60	52	0.3	0.4	0.6	0.7	0.7	0.7
528 Synthetic resins, natural rubbers (class 520 series)	35	6	32	90	48	1.0	0.2	0.7	1.1	0.6	1.3
128 Surgery	12	14	21	33	47	0.3	0.6	0.4	0.4	0.6	1.7
264 Plastic, nonmetallic article shaping, treating	27	20	33	70	46	0.8	0.8	0.7	0.9	0.6	0.9
623 Prosthesis, artificial body members	35	21	59	60	45	1.0	0.9	1.3	0.7	0.6	3.8
378 X-ray, gamma ray systems, devices	46	24	37	68	44	1.3	1.0	0.8	0.8	0.6	3.3
422 Chemical apparatus, process disinfecting	21	13	33	58	43	0.6	0.5	0.7	0.7	0.6	1.3
385 Optical waveguides	10	19	48	45	42	0.3	0.8	1.0	0.6	0.5	1.6
546 Organic compounds (class 532–570 series)	37	9	29	63	39	1.1	0.4	0.6	0.8	0.5	2.0
252 Compositions	20	14	18	51	39	0.6	0.6	0.4	0.6	0.5	1.1
502 Catalyst, solid sorbent, support therefor	11	12	23	50	39	0.3	0.5	0.5	0.6	0.5	1.2
526 Synthetic resins, natural rubbers (class 520 series)	9	3	19	39	38	0.3	0.1	0.4	0.5	0.5	1.1
342 Communications: directive radio wave systems	19	3	10	29	38	0.6	0.1	0.2	0.4	0.5	1.1
702 Data processing: measuring, calibrating, testing	3	4	27	39	36	0.1	0.2	0.6	0.5	0.5	2.1

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 6-68.
Patents awarded to U.S. universities and colleges, by utility class and University Activity Index: 1969–98

Utility Class	Number of academic patents					Percent of academic patents					University Activity Index[a]
	1969–80	1981–85	1986–90	1991–95	1996–98	1969–80	1981–85	1986–90	1991–95	1996–98	
607 Surgery: light, thermal, electrical application	22	20	42	43	34	0.6	0.8	0.9	0.5	0.4	3.1
429 Chemistry: electrical current producing apparatus	16	22	18	30	34	0.5	0.9	0.4	0.4	0.4	1.2
540 Organic compounds (class 532-570 series)	21	12	36	38	33	0.6	0.5	0.8	0.5	0.4	1.8
548 Organic compounds (class 532-570 series)	18	9	25	33	29	0.5	0.4	0.5	0.4	0.4	1.1
117 Single-, oriented-crystal, epitaxy growth processes	12	9	26	30	29	0.3	0.4	0.6	0.4	0.4	3.5
310 Electrical generator, motor structure	36	10	18	30	28	1.0	0.4	0.4	0.4	0.4	0.9
707 Data processing: database, file management	2	0	2	3	28	0.1	0.0	0.0	0.0	0.4	0.8
430 Radiation imagery chemistry	8	10	19	21	28	0.2	0.4	0.4	0.3	0.4	0.3
505 Superconductors: apparatus, materials, processes	0	0	29	120	27	0.0	0.0	0.6	1.5	0.3	9.6
544 Organic compounds (class 532-570 series)	9	10	20	34	25	0.3	0.4	0.4	0.4	0.3	1.0
318 Electricity: motive power systems	14	5	7	34	23	0.4	0.2	0.1	0.4	0.3	0.7
349 Liquid crystal cells, elements, systems	1	0	6	22	23	0.0	0.0	0.1	0.3	0.3	1.1
315 Electric lamp, discharge devices: systems	19	8	11	16	23	0.6	0.3	0.2	0.2	0.3	0.7
521 Synthetic resins, natural rubbers (class 520 series)	20	5	5	21	23	0.6	0.2	0.1	0.3	0.3	1.0
348 Television	21	4	32	53	23	0.6	0.2	0.7	0.6	0.3	0.6
706 Data processing: artificial intelligence	2	0	5	26	22	0.1	0.0	0.1	0.3	0.3	3.3
524 Synthetic resins, natural rubbers (class 520 series)	11	3	8	27	22	0.3	0.1	0.2	0.3	0.3	0.3
704 Data processing: speech signal processing etc.	5	4	10	11	22	0.1	0.2	0.2	0.1	0.3	1.4
313 Electric lamp and discharge devices	10	3	4	5	21	0.3	0.1	0.1	0.1	0.3	0.4
219 Electric heating	14	9	15	32	21	0.4	0.4	0.3	0.4	0.3	0.4
205 Electrolysis: processes, compositions, methods	23	29	35	57	21	0.7	1.2	0.7	0.7	0.3	1.4
148 Metal treatment	12	12	14	37	20	0.3	0.5	0.3	0.5	0.3	1.0
106 Compositions: coating, plastic	11	6	8	18	19	0.3	0.2	0.2	0.2	0.2	0.6
556 Organic compounds (class 532–570 series)	17	13	26	53	19	0.5	0.5	0.6	0.6	0.2	2.4
361 Electricity: electrical systems, devices	12	1	8	15	18	0.3	0.0	0.2	0.2	0.2	0.3
62 Refrigeration	17	15	19	30	17	0.5	0.6	0.4	0.4	0.2	0.6
156 Adhesive bonding, misc. chemical manufacture	3	6	9	16	17	0.1	0.2	0.2	0.2	0.2	0.2
564 Organic compounds (class 532–570 series)	14	5	10	21	17	0.4	0.2	0.2	0.3	0.2	0.9
552 Organic compounds (class 532–570 series)	50	32	14	13	17	1.5	1.3	0.3	0.2	0.2	4.6
52 Static structures	6	8	5	12	16	0.2	0.3	0.1	0.1	0.2	0.2
588 Hazardous, toxic waste destruction, containment	0	3	1	10	16	0.0	0.1	0.0	0.1	0.2	2.1
504 Plant protecting, regulating compositions	11	4	20	32	16	0.3	0.2	0.4	0.4	0.2	1.1
585 Chemistry of hydrocarbon compounds	10	6	13	22	16	0.3	0.2	0.3	0.3	0.2	0.8
562 Organic compounds (class 532–570 series)	16	7	9	32	16	0.5	0.3	0.2	0.4	0.2	1.0
216 Etching a substrate: processes	3	1	14	25	16	0.1	0.0	0.3	0.3	0.2	1.8
568 Organic compounds (class 532–570 series)	42	14	15	31	15	1.2	0.6	0.3	0.4	0.2	1.0
60 Power plants	12	8	7	15	15	0.3	0.3	0.1	0.2	0.2	0.3
340 Communications: electrical	16	5	10	23	15	0.5	0.2	0.2	0.3	0.2	0.3
434 Education and demonstration	24	4	9	6	15	0.7	0.2	0.2	0.1	0.2	1.0
All others	1,032	534	806	1,214	814	30.0	21.6	17.1	14.9	10.5	0.3

[a]The University Activity Index is calculated by dividing the proportion of university patents in a given class by the proportion of all patents in that class. Index values greater than 1.0 indicate technology classes that receive relatively greater emphasis in university patenting than elsewhere.

SOURCES: U.S. Patent and Trademark Office, *Technology Assessment and Forecast Report, U.S. Universities and Colleges, 1969-98* (Washington, DC: 1999); and National Science Foundation, Division of Science Resources Studies (NSF/SRS), special tabulation.

See figure 6-44 in Volume 1.

Appendix table 7-1.
Real gross domestic product, for selected countries: 1960–95
(Billions of 1995 U.S. dollars)

	United States	Canada	Japan	South Korea	Austria	Belgium	Denmark	France	Germany[a]	Italy	Nether-lands	Norway	Sweden	United Kingdom
1960	2,433.07	170.88	415.98	36.12	55.01	76.32	43.97	378.74	544.64	345.35	100.42	29.26	70.36	507.23
1961	2,484.81	176.24	476.54	38.23	57.93	80.11	46.56	399.60	569.86	373.69	103.33	31.04	74.36	520.29
1962	2,634.66	188.73	510.18	39.05	59.32	84.29	49.12	426.26	596.43	396.87	107.77	31.88	77.53	527.20
1963	2,747.51	198.52	563.76	42.62	61.74	87.96	49.35	449.05	613.21	419.14	111.33	33.08	81.66	548.05
1964	2,907.69	211.76	638.25	46.74	65.47	94.08	53.76	478.32	654.06	430.86	120.90	34.74	87.23	577.85
1965	3,092.62	225.73	671.01	49.42	67.34	97.43	56.34	501.18	689.08	444.94	127.31	36.58	90.56	592.48
1966	3,292.07	241.05	742.11	55.44	71.14	100.51	57.67	527.31	708.30	471.57	130.87	37.96	92.46	603.68
1967	3,378.13	248.12	822.07	58.71	73.28	104.40	59.64	552.03	706.12	505.42	137.81	40.34	95.57	617.52
1968	3,537.77	261.40	927.04	65.36	76.56	108.79	62.01	575.54	744.63	538.50	147.04	41.25	99.05	642.68
1969	3,644.70	275.40	1,040.77	74.42	81.36	116.01	65.93	615.77	800.18	571.34	157.04	43.11	104.01	655.93
1970	3,644.92	282.55	1,142.86	80.94	87.16	123.39	67.26	651.06	840.49	601.68	166.07	43.97	110.74	670.90
1971	3,765.30	298.82	1,193.03	87.81	91.61	127.92	69.06	682.20	866.19	613.08	173.46	45.98	111.79	684.23
1972	3,969.91	315.94	1,293.40	92.04	97.30	134.68	72.70	712.43	903.01	631.02	178.85	48.36	114.34	708.19
1973	4,197.97	340.31	1,397.29	103.82	102.06	142.64	75.34	751.19	946.04	672.30	187.88	50.34	118.88	760.31
1974	4,182.80	355.29	1,380.17	112.20	106.08	148.47	74.64	774.55	947.89	703.83	195.49	52.96	122.68	747.39
1975	4,157.95	364.53	1,422.84	119.64	105.70	146.26	74.15	772.39	936.02	688.72	195.78	55.17	125.82	742.01
1976	4,390.32	386.99	1,479.40	133.72	110.53	154.41	78.95	805.17	985.85	733.47	205.11	58.92	127.15	762.61
1977	4,603.54	400.98	1,544.35	147.51	115.55	155.15	80.23	831.07	1,013.90	754.67	209.90	61.03	125.12	780.63
1978	4,834.18	419.32	1,625.77	161.36	115.62	159.39	81.41	858.92	1,044.29	782.80	214.85	63.80	127.31	807.61
1979	4,974.35	435.55	1,714.93	172.87	121.10	162.79	84.30	886.76	1,088.41	827.21	219.63	67.04	132.20	830.20
1980	4,961.34	442.02	1,763.25	168.23	124.64	169.82	83.92	901.16	1,099.08	856.42	222.28	69.86	134.40	812.25
1981	5,082.90	458.25	1,819.15	178.67	124.28	167.06	83.18	911.76	1,100.17	860.48	221.16	70.47	134.39	801.77
1982	4,973.92	443.51	1,874.76	192.23	125.61	169.83	85.69	934.97	1,089.82	864.42	218.58	70.70	135.73	815.63
1983	5,174.45	457.54	1,918.30	214.33	128.11	170.08	87.85	941.47	1,108.99	874.95	222.32	73.98	138.11	845.62
1984	5,527.51	486.40	1,993.44	232.93	129.85	173.81	91.70	953.84	1,140.20	897.42	229.63	78.23	143.70	865.27
1985	5,733.31	509.59	2,081.24	248.18	133.05	175.10	95.64	971.79	1,163.35	922.64	236.70	82.36	146.47	897.76
1986	5,905.86	526.49	2,141.50	276.86	134.62	177.96	99.12	996.26	1,190.63	948.84	243.22	85.80	149.83	936.21
1987	6,076.37	548.42	2,230.56	308.75	136.85	181.74	99.41	1,018.68	1,208.23	978.22	246.66	87.51	154.55	981.27
1988	6,307.12	575.73	2,368.74	343.55	142.41	190.69	100.57	1,064.50	1,253.21	1,016.06	253.11	87.07	158.03	1,030.37
1989	6,519.59	589.81	2,483.18	365.48	147.86	197.26	101.14	1,109.77	1,298.64	1,045.35	264.96	87.86	161.78	1,052.86
1990	6,603.82	588.43	2,609.42	400.23	154.14	204.52	102.58	1,137.60	1,372.71	1,067.96	275.84	89.50	163.99	1,057.04
1991	6,539.60	577.91	2,713.01	436.78	158.52	207.74	103.96	1,146.48	1,441.98	1,080.12	282.11	92.29	162.16	1,036.31
1992	6,717.53	582.33	2,741.60	458.91	161.75	211.25	104.20	1,159.81	1,467.42	1,086.22	287.82	95.31	159.85	1,030.82
1993	6,870.29	595.26	2,745.11	485.30	162.34	208.39	105.74	1,144.38	1,438.83	1,073.67	290.02	97.95	156.30	1,052.18
1994	7,109.43	619.49	2,758.25	526.93	167.29	213.27	110.38	1,176.72	1,470.80	1,096.49	299.85	102.88	161.52	1,092.55
1995	7,253.80	633.90	2,781.74	574.11	170.34	217.39	113.45	1,202.09	1,494.22	1,129.04	306.27	106.24	167.29	1,119.85

[a]German data are for the former West Germany only.

NOTE: Country gross domestic products were determined with 1993 purchasing power parities using the Elteto-Köves-Szulc (EKS) aggregation method, which is the method used by the Organisation for Economic Co-operation and Development (OECD) and EUROSTAT in their official statistics. For a discussion of the properties of this aggregation method, see OECD, *Purchasing Power Parities and Real Expenditures, 1993: Volume 1, EKS Results* (Paris, 1995), p. 4.

SOURCE: U.S. Bureau of Labor Statistics, Office of Productivity and Technology, *Comparative Real Gross Domestic Product Per Capita and Per Employed Person, Fourteen Countries, 1960-1995* (Washington, DC, April 1997).

See figure 7-1 in Volume 1.

Appendix table 7-2.
Real gross domestic product per capita, for selected countries: 1960–96
(1996 U.S. dollars)

	United States	Canada	Japan	South Korea	Austria	Belgium	Denmark	France	Germany[a]	Italy	Nether-lands	Norway	Sweden	United Kingdom
1960	13,797	9,738	4,508	1,458	7,890	8,568	9,690	8,380	9,928	7,128	8,839	8,356	9,508	9,791
1961	13,882	9,845	5,119	1,498	8,263	8,964	10,190	8,749	10,251	7,684	8,975	8,794	9,995	9,960
1962	14,500	10,348	5,429	1,487	8,410	9,393	10,671	9,167	10,604	8,094	9,231	8,958	10,363	10,000
1963	14,901	10,684	5,942	1,579	8,697	9,729	10,636	9,485	10,797	8,484	9,405	9,228	10,854	10,331
1964	15,553	11,183	6,658	1,687	9,160	10,309	11,498	10,000	11,401	8,634	10,078	9,617	11,508	10,819
1965	16,339	11,707	6,924	1,739	9,361	10,579	11,956	10,389	11,879	8,846	10,468	10,047	11,836	11,020
1966	17,206	12,271	7,588	1,902	9,820	10,840	12,136	10,841	12,101	9,305	10,621	10,342	11,969	11,168
1967	17,452	12,406	8,316	1,968	10,040	11,198	12,442	11,261	12,036	9,888	11,058	10,896	12,277	11,358
1968	18,084	12,870	9,271	2,141	10,435	11,622	12,862	11,654	12,646	10,459	11,679	11,046	12,650	11,766
1969	18,449	13,366	10,281	2,382	11,052	12,359	13,602	12,369	13,461	11,026	12,331	11,447	13,191	11,956
1970	18,258	13,523	11,137	2,535	11,798	13,139	13,777	12,961	14,003	11,524	12,880	11,596	13,917	12,191
1971	18,626	13,846	11,512	2,697	12,346	13,590	14,047	13,454	14,283	11,665	13,289	12,048	13,952	12,367
1972	19,438	14,470	12,312	2,774	13,036	14,254	14,702	13,928	14,796	11,922	13,561	12,574	14,229	12,762
1973	20,366	15,395	12,998	3,074	13,598	15,050	15,145	14,568	15,425	12,611	14,131	12,999	14,768	13,670
1974	20,050	15,852	12,664	3,266	14,110	15,619	14,936	14,923	15,436	13,080	14,590	13,590	15,195	13,435
1975	19,768	16,030	12,896	3,425	14,096	15,344	14,793	14,814	15,298	12,711	14,487	14,078	15,522	13,340
1976	20,634	16,794	13,260	3,767	14,767	16,173	15,710	15,382	16,190	13,462	15,053	14,967	15,630	13,713
1977	21,381	17,197	13,707	4,091	15,432	16,232	15,918	15,806	16,687	13,802	15,312	15,437	15,326	14,044
1978	22,292	17,804	14,299	4,408	15,454	16,662	16,102	16,265	17,207	14,270	15,579	16,077	15,549	14,532
1979	22,672	18,310	14,959	4,651	16,214	17,006	16,631	16,720	17,925	15,037	15,818	16,715	16,111	14,922
1980	22,335	18,343	15,259	4,456	16,687	17,721	16,538	16,905	18,040	15,553	15,880	17,487	16,347	14,576
1981	22,620	18,782	15,629	4,660	16,597	17,487	16,394	17,009	18,024	15,594	15,690	17,594	16,325	14,383
1982	21,928	17,961	15,998	4,936	16,758	17,731	16,899	17,342	17,867	15,603	15,437	17,560	16,479	14,640
1983	22,593	18,344	16,258	5,423	17,112	17,734	17,341	17,374	18,245	15,728	15,640	18,122	16,760	15,163
1984	23,964	19,314	16,788	5,822	17,337	18,174	18,110	17,521	18,834	16,099	16,092	19,132	17,423	15,479
1985	24,600	20,048	17,422	6,142	17,746	18,348	18,879	17,767	19,264	16,506	16,513	20,070	17,730	16,010
1986	25,129	20,506	17,817	6,784	17,933	18,613	19,540	18,128	19,702	16,951	16,876	20,715	18,094	16,647
1987	25,640	21,082	18,467	7,491	18,205	19,039	19,575	18,444	19,990	17,449	17,002	21,037	18,601	17,400
1988	26,378	21,847	19,527	8,255	18,901	19,833	19,791	19,173	20,609	18,093	17,333	20,900	18,933	18,223
1989	27,007	21,986	20,386	8,695	19,514	20,512	19,892	19,880	21,144	18,590	18,039	21,006	19,254	18,556
1990	27,057	21,609	21,350	9,428	20,157	21,073	20,144	20,267	21,930	18,959	18,653	21,346	19,366	18,564
1991	26,517	20,974	22,092	10,188	20,508	21,326	20,361	20,310	22,741	19,115	18,924	21,907	19,020	18,122
1992	26,943	20,823	22,249	10,594	20,659	21,559	20,340	20,433	22,860	19,199	19,162	22,493	18,640	17,964
1993	27,278	20,987	22,253	11,089	20,533	21,153	20,585	20,063	22,164	19,239	19,172	22,971	18,120	18,280
1994	27,947	21,611	22,345	11,920	21,264	21,575	21,410	20,220	22,788	19,815	19,757	23,006	18,472	18,601
1995	28,233	21,844	22,542	12,856	21,206	21,558	21,945	20,362	22,865	20,125	20,304	23,262	19,118	18,341
1996	28,752	21,905	23,289	13,635	21,375	21,829	22,401	20,583	23,059	20,227	20,881	24,364	19,293	18,715

[a]German data are for the former West Germany only.

NOTE: Country gross domestic products were determined with 1993 purchasing power parities using the Elteto-Köves-Szulc (EKS) aggregation method, which is the method used by the Organisation for Economic Co-operation and Development (OECD) and EUROSTAT in their official statistics. For a discussion of the properties of this aggregation method, see OECD, *Purchasing Power Parities and Real Expenditures, 1993: Volume 1, EKS Results* (Paris: 1995), p. 4.

SOURCE: U.S. Bureau of Labor Statistics, Office of Productivity and Technology, *Comparative Real Gross Domestic Product Per Capita and Per Employed Person, Fourteen Countries, 1960-1996* (Washington, DC: February 1998). BLS does not publish this data due to statistical limitations.

See figure 7-1 in Volume 1.

Appendix table 7-3.
Real gross domestic product per employed person, for selected countries: 1960–96
(1996 U.S. dollars)

	United States	Canada	Japan	South Korea	Austria	Belgium	Denmark	France	Germany[a]	Italy	Nether-lands	Norway	Sweden	United Kingdom
1960	36,520	NA	9,648	NA	17,405	22,600	21,870	19,397	21,117	NA	22,036	19,730	19,670	21,258
1961	37,335	NA	10,907	NA	18,184	23,548	22,823	20,467	21,791	NA	22,349	20,608	20,620	21,582
1962	38,912	NA	11,544	NA	18,771	24,399	23,717	21,837	22,728	NA	22,852	21,044	21,383	21,761
1963	40,012	NA	12,649	5,617	19,667	25,283	23,537	22,822	23,312	NA	23,288	21,744	22,410	22,567
1964	41,434	NA	14,110	6,052	20,885	26,661	25,124	24,045	24,843	NA	24,855	22,760	23,600	23,488
1965	43,021	NA	14,608	6,082	21,623	27,504	25,856	25,116	26,026	NA	25,951	23,766	24,333	23,843
1966	44,499	NA	15,815	6,647	23,071	28,273	26,021	26,230	26,834	NA	26,472	24,557	24,807	24,236
1967	44,574	NA	17,164	6,802	24,188	29,498	27,081	27,390	27,652	NA	27,961	25,914	25,919	25,080
1968	45,691	NA	18,995	7,210	25,602	30,771	27,845	28,641	29,136	NA	29,560	26,466	26,580	26,228
1969	45,944	NA	21,120	7,983	27,225	32,264	29,342	30,183	30,829	NA	31,054	27,418	27,396	26,769
1970	45,741	NA	22,929	8,387	29,052	34,289	29,725	31,486	31,977	NA	32,455	27,522	28,609	27,458
1971	47,072	NA	23,780	8,810	30,185	35,299	30,343	32,844	32,822	NA	33,698	28,522	28,936	28,417
1972	48,231	NA	25,725	8,803	31,833	37,243	31,288	34,097	34,082	NA	35,048	29,673	29,501	29,232
1973	49,391	NA	27,088	9,412	32,826	39,097	32,020	35,462	35,320	NA	36,802	30,691	30,557	30,780
1974	48,174	NA	26,854	9,780	33,834	40,097	31,827	36,249	35,824	NA	37,925	31,869	30,921	30,185
1975	48,503	NA	27,780	10,214	33,911	40,080	32,022	36,466	36,351	NA	38,277	32,567	31,097	30,124
1976	49,506	40,097	28,613	10,755	35,257	42,540	33,494	37,716	38,490	NA	39,869	33,663	31,318	31,211
1977	50,027	40,712	29,475	11,522	36,524	42,915	33,761	38,609	39,529	NA	39,954	33,997	30,756	31,909
1978	50,557	41,169	30,653	12,080	36,462	44,054	33,904	39,707	40,385	NA	40,515	34,916	31,178	32,748
1979	50,574	41,026	31,934	12,777	37,966	44,586	34,687	40,916	41,397	NA	40,659	35,914	31,911	33,237
1980	50,159	40,441	32,499	12,416	38,950	46,571	34,696	41,512	41,165	NA	39,906	36,779	32,087	32,857
1981	50,740	40,767	33,250	12,867	38,820	46,847	34,845	42,204	41,250	41,518	39,494	36,652	32,031	33,589
1982	50,068	40,742	33,923	13,501	39,741	48,142	35,737	43,160	41,355	41,847	39,242	36,712	32,414	34,527
1983	51,385	41,760	34,143	14,922	40,914	48,641	36,529	43,521	42,690	42,276	40,709	38,111	32,906	35,932
1984	52,834	43,253	35,281	16,303	41,489	49,945	37,484	44,484	43,821	43,192	41,521	40,055	33,955	36,054
1985	53,638	44,004	36,585	16,742	42,407	50,158	38,138	45,457	44,380	44,281	41,608	41,027	34,257	36,876
1986	54,078	44,144	37,333	18,032	42,727	50,568	38,517	46,418	44,800	45,317	42,095	41,156	34,828	38,177
1987	54,286	44,773	38,500	19,066	43,453	51,498	38,299	47,311	45,136	46,871	41,972	41,148	35,639	39,161
1988	55,159	45,559	40,206	20,567	44,951	53,152	38,977	49,002	46,454	48,565	43,142	41,281	35,948	39,801
1989	55,886	45,724	41,323	21,019	45,988	54,215	39,416	50,422	47,447	50,004	44,119	42,871	36,273	39,684
1990	55,911	45,348	42,575	22,349	47,031	55,054	40,383	51,155	48,707	50,492	44,116	44,076	36,431	39,517
1991	55,912	45,391	43,345	23,700	47,610	55,869	41,546	51,499	49,921	50,716	44,346	45,799	36,573	39,696
1992	57,133	46,007	43,313	24,442	48,363	56,961	41,906	52,479	50,339	51,445	43,813	47,431	37,731	40,358
1993	57,687	46,418	43,315	25,456	48,809	56,717	42,969	52,390	50,081	52,147	43,752	48,632	38,930	41,535
1994	58,391	47,306	43,560	26,826	50,718	58,617	44,933	53,063	52,372	54,715	45,154	48,372	40,380	42,102
1995	58,731	47,654	44,138	28,449	50,833	58,517	45,556	53,124	53,142	55,990	46,026	48,138	41,372	40,979
1996	59,534	47,771	45,488	29,908	51,625	59,308	46,278	53,912	54,397	56,173	46,909	49,427	42,037	41,514

NA = not available

[a]German data are for the former West Germany only.

NOTE: Country gross domestic products were determined with 1993 purchasing power parities using the Elteto-Köves-Szulc (EKS) aggregation method, which is the method used by the Organisation for Economic Co-operation and Development (OECD) and EUROSTAT in their official statistics. For a discussion of the properties of this aggregation method, see OECD, *Purchasing Power Parities and Real Expenditures, 1993: Volume 1, EKS Results* (Paris: 1995), p. 4.

SOURCE: U.S. Bureau of Labor Statistics (BLS), Office of Productivity and Technology, *Comparative Real Gross Domestic Product Per Capita and Per Employed Person, Fourteen Countries, 1960-1996* (Washington, DC: February 1998). BLS does not publish this data due to statistical limitations.

See figure 7-1 in Volume 1.

Appendix table 7-4.
Global industry and trade data, by selected countries and industries: 1980–97
(In millions of 1997 U.S. dollars)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
All manufacturing industries																		
Production																		
United States	2,627,845.76	2,715,475.67	2,542,569.64	2,634,378.28	2,839,178.30	2,828,920.41	2,842,883.60	3,061,542.32	3,195,092.45	3,174,911.40	3,161,790.37	3,083,576.00	3,237,132.08	3,324,797.54	3,491,728.01	3,617,805.24	3,777,389.79	3,997,801.31
Canada	193,565.74	209,494.66	192,622.47	204,151.50	230,327.67	251,360.24	260,082.88	267,572.07	279,207.43	274,908.74	259,737.78	245,278.94	251,809.49	275,060.32	305,250.89	319,979.21	327,499.27	344,408.58
Japan	1,633,760.64	1,744,538.83	1,835,420.93	1,892,267.48	2,016,382.86	2,124,310.99	2,029,555.99	2,030,456.51	2,195,097.62	2,345,592.41	2,524,046.65	2,648,493.14	2,544,959.08	2,409,522.79	2,401,671.63	2,475,955.96	2,527,304.31	2,600,179.87
Germany[a]	800,156.70	857,638.15	870,590.55	885,241.57	937,974.67	999,257.83	993,961.24	991,667.86	1,033,355.57	1,103,420.70	1,149,641.43	1,215,871.18	1,179,208.35	1,215,892.00	1,302,437.69	1,313,362.62	1,298,336.68	1,300,221.30
France	502,168.03	531,890.48	554,994.30	561,887.60	578,094.49	595,348.36	584,913.23	588,560.87	616,500.16	653,077.46	666,806.08	667,908.57	662,553.89	623,051.02	654,590.69	664,788.69	653,309.10	684,557.62
United Kingdom	495,959.91	484,415.17	497,497.30	519,048.92	554,926.29	577,703.97	576,946.99	604,464.88	625,599.14	635,646.71	619,989.23	574,119.09	605,817.54	635,620.20	686,083.99	694,430.96	698,792.88	706,900.44
Italy	356,890.87	366,666.27	359,349.35	378,121.38	409,565.78	409,830.70	400,445.81	409,225.30	429,446.68	441,677.97	427,884.14	422,089.04	442,741.39	441,453.74	500,755.55	525,803.78	513,376.17	519,294.21
China	177,830.82	162,579.40	174,898.13	195,113.57	207,362.33	239,311.70	260,311.07	295,627.65	348,453.07	386,955.33	362,432.52	401,307.75	479,894.43	619,625.23	737,053.90	741,470.66	808,551.11	899,543.79
South Korea	78,701.59	92,008.28	99,331.66	114,117.48	130,265.46	136,982.44	164,818.09	194,895.91	214,825.54	225,858.63	248,869.02	269,718.76	286,068.46	310,439.51	346,424.56	395,385.99	417,943.40	438,441.95
Taiwan	92,965.36	97,781.99	99,507.60	111,844.60	129,535.60	139,242.59	169,562.33	183,475.98	199,513.25	199,409.47	194,812.81	207,607.83	204,830.07	217,339.58	222,039.48	233,227.62	233,298.09	242,672.54
Singapore	22,885.18	26,159.59	25,853.62	25,835.84	29,653.65	29,316.28	32,283.57	39,417.54	46,877.81	42,575.19	45,495.56	47,452.81	49,511.03	52,768.27	58,993.60	65,441.44	69,646.82	73,427.35
Hong Kong	37,143.04	44,866.76	41,057.89	52,054.49	52,839.76	48,191.57	60,153.95	69,303.25	70,157.35	64,697.10	59,710.36	56,276.13	53,347.64	47,214.65	43,200.87	45,112.33	45,911.50	46,953.95
All countries[b]	9,456,480.88	9,841,695.05	9,786,141.78	10,126,075.47	10,916,585.49	11,322,032.42	11,433,810.41	11,928,549.87	12,561,987.95	13,062,219.92	13,201,905.81	13,275,823.35	13,320,393.91	13,368,581.50	14,117,457.65	14,610,629.59	14,990,548.10	15,675,731.23
Exports																		
United States	250,349.97	261,409.92	235,996.41	214,884.76	222,481.12	224,536.64	236,425.40	262,181.97	307,976.10	359,331.93	383,510.76	411,265.81	439,850.99	440,952.21	486,869.80	547,734.19	573,435.34	618,687.25
Canada	48,775.09	55,191.95	56,152.00	60,333.59	72,349.99	77,172.56	85,871.71	84,080.11	94,281.59	91,356.36	95,108.46	96,496.27	105,602.91	114,701.05	132,277.15	156,311.65	161,969.94	180,132.55
Japan	187,573.55	216,480.13	215,629.45	221,397.19	251,001.04	265,923.56	261,426.12	255,972.55	274,982.97	290,635.53	302,217.32	305,779.01	306,911.01	293,178.06	296,412.10	320,305.82	333,171.13	351,922.59
Germany[a]	247,726.12	290,678.45	303,321.60	296,674.17	321,926.05	350,903.21	343,601.35	348,625.26	396,873.31	423,282.89	415,430.15	434,629.56	439,326.14	441,857.36	479,457.95	505,209.95	533,472.66	567,457.11
France	117,603.99	132,829.55	131,561.48	132,247.00	142,121.70	149,059.01	145,371.22	149,869.89	173,013.42	185,048.09	189,965.97	204,685.07	214,264.19	227,400.95	239,092.62	253,587.52	269,129.41	292,635.71
United Kingdom	137,436.48	131,104.77	130,909.35	128,169.75	137,406.83	147,167.40	163,317.98	169,066.08	199,258.01	200,004.37	211,292.12	231,573.71	233,112.62	242,453.84	245,366.48	269,701.84	288,741.51	307,832.99
Italy	93,887.50	108,497.27	108,620.93	111,565.17	118,537.51	130,056.75	129,472.34	130,713.93	146,717.27	156,861.62	153,594.35	157,286.03	163,448.84	193,071.94	206,426.11	233,779.74	239,879.60	251,052.78
China	14,781.22	17,307.64	17,024.26	17,197.00	18,939.73	16,825.02	22,003.87	26,350.59	40,655.58	40,838.90	57,019.03	66,662.93	80,392.89	89,728.24	111,814.63	133,909.35	145,275.21	157,324.54
South Korea	23,808.51	31,695.35	34,851.90	37,987.55	45,903.92	48,085.24	53,640.84	65,562.70	80,165.05	84,125.59	81,294.14	89,756.03	93,169.66	100,019.04	112,923.10	137,636.52	147,510.92	161,508.79
Taiwan	25,974.14	28,751.94	28,309.18	30,651.76	36,271.19	37,375.39	52,350.22	70,903.72	83,151.58	91,543.84	90,684.02	99,964.65	111,536.32	116,503.81	122,798.61	135,149.96	142,020.20	145,061.34
Singapore	18,562.16	20,877.18	22,017.83	24,487.15	27,804.69	27,753.74	34,728.53	41,215.91	56,440.52	65,843.11	68,427.50	78,092.56	84,665.90	96,271.32	117,014.09	136,310.14	144,746.08	148,466.62
Hong Kong	35,475.94	42,513.44	42,933.83	46,248.55	55,228.72	59,077.55	69,222.67	90,070.47	116,021.52	127,333.95	138,500.05	157,302.20	189,392.46	201,077.60	218,439.97	241,041.11	252,899.57	270,055.88
All countries[b]	1,774,446.49	1,942,477.35	1,920,534.59	1,952,005.94	2,123,885.63	2,258,801.67	2,345,874.81	2,475,498.14	2,851,912.30	3,057,084.20	3,155,292.40	3,370,925.75	3,611,174.30	3,864,139.97	4,212,793.11	4,657,748.08	4,924,075.73	5,252,520.93
Imports																		
United States	207,294.09	243,568.86	249,358.30	295,770.62	382,917.79	422,658.04	436,543.48	431,230.47	450,718.53	473,035.33	460,017.36	447,120.53	500,290.89	560,604.94	615,868.85	655,130.42	686,140.52	741,224.91
Canada	55,390.96	63,009.09	53,372.20	60,779.69	72,155.19	76,119.49	77,826.00	82,823.29	95,833.24	104,977.08	105,023.84	105,584.58	105,972.49	113,647.93	129,154.79	138,630.78	144,504.02	154,886.59
Japan	53,863.00	58,065.32	57,304.46	59,846.75	66,843.90	69,417.46	82,471.12	102,386.46	131,592.84	147,389.99	155,440.87	160,488.97	161,676.11	176,387.57	199,096.80	234,679.42	239,898.66	232,643.62
Germany[a]	161,623.34	159,385.11	155,387.66	166,343.83	171,672.52	184,896.27	209,441.29	222,889.88	247,348.08	261,573.24	297,743.86	344,063.42	353,452.29	351,954.56	375,733.23	408,619.24	423,376.23	441,714.02
France	112,692.89	119,249.64	125,015.96	118,873.92	121,591.15	130,899.45	142,757.20	155,218.36	183,368.59	198,312.54	206,261.65	214,237.52	214,844.59	215,567.36	229,490.34	248,618.54	256,241.60	267,738.05
United Kingdom	132,432.11	136,593.98	138,092.02	147,617.79	156,982.12	166,936.33	169,260.31	181,814.44	229,328.30	232,190.91	227,604.97	219,487.38	228,171.71	242,779.90	257,485.61	278,959.37	300,040.20	332,821.60
Italy	75,983.61	74,629.80	74,103.72	73,160.83	80,947.12	89,835.66	96,154.32	109,089.67	124,603.75	135,641.83	141,447.73	146,511.48	151,458.09	137,781.88	148,536.11	166,351.20	170,931.66	182,946.84
China	15,141.88	15,334.65	14,321.01	18,025.81	28,479.21	47,484.84	43,251.08	41,403.80	56,042.25	56,734.26	54,477.56	66,472.78	85,771.48	122,258.75	132,782.60	147,024.73	160,030.55	176,378.61
South Korea	18,302.70	20,856.60	21,057.34	24,455.24	29,576.32	30,182.20	34,579.75	42,243.69	50,286.80	57,848.48	63,429.01	73,417.57	69,099.37	73,756.55	90,603.18	115,099.05	125,118.03	127,070.38
Taiwan	17,922.73	19,202.26	17,766.40	19,599.30	22,700.81	21,469.44	25,852.84	34,828.18	45,583.12	51,988.00	52,907.40	61,123.23	70,754.99	77,891.57	82,360.77	95,547.58	99,333.14	110,563.99
Singapore	31,202.87	34,391.44	36,710.60	38,143.90	39,341.27	37,039.90	38,336.33	45,244.30	56,988.40	66,198.11	75,589.35	85,275.52	93,451.57	109,222.52	126,325.24	151,588.41	166,007.93	179,281.47
Hong Kong	42,818.57	48,790.07	47,859.38	49,209.75	57,445.98	57,224.07	63,589.59	78,231.52	108,508.59	111,252.08	135,033.18	160,359.10	189,891.20	189,578.43	214,314.70	242,360.70	257,778.44	283,140.33
All countries[b]	1,674,279.93	1,808,565.25	1,782,077.70	1,820,911.74	2,000,703.76	2,122,993.90	2,231,134.43	2,366,217.54	2,742,567.87	2,951,512.36	3,068,448.05	3,264,928.28	3,496,175.19	3,735,528.71	4,101,998.00	4,545,874.04	4,807,885.70	5,123,507.72

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-4.
Global industry and trade data, by selected countries and industries: 1980–97
(In millions of 1997 U.S. dollars)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Apparent consumption																		
United States	2,614,220.87	2,804,088.29	2,664,480.54	2,803,049.90	3,103,945.39	3,090,388.20	3,126,926.83	3,317,046.79	3,429,450.22	3,401,154.37	3,369,991.82	3,274,809.59	3,475,895.56	3,606,554.38	3,846,335.36	3,975,800.50	4,085,051.28	4,346,811.01
Canada	215,703.93	235,295.24	206,766.56	222,440.19	252,879.57	268,709.85	274,093.60	288,611.97	304,911.34	311,752.20	294,374.57	279,778.11	280,211.68	302,722.74	321,996.25	323,893.34	332,797.42	343,918.23
Japan	1,544,395.68	1,636,195.68	1,709,253.54	1,755,035.06	1,870,370.32	1,949,038.66	1,899,309.25	1,934,847.01	2,118,661.66	2,277,504.26	2,454,742.74	2,606,562.09	2,513,053.41	2,380,361.83	2,435,381.31	2,604,413.67	2,733,511.84	2,733,961.26
Germany[a]	831,453.47	864,112.75	867,245.46	896,266.02	940,188.00	997,328.77	1,021,323.20	1,032,140.71	1,073,229.62	1,143,499.80	1,230,341.14	1,332,041.13	1,303,540.21	1,336,742.24	1,427,999.33	1,476,484.39	1,499,942.51	1,527,320.05
France	543,852.74	570,696.34	598,100.18	591,650.65	605,617.73	616,677.07	625,423.18	637,249.09	677,885.08	721,406.39	740,385.91	742,059.00	732,357.46	680,568.61	709,862.25	736,914.12	745,916.20	759,052.92
United Kingdom	542,135.51	535,952.26	545,776.54	574,898.01	620,220.31	641,243.14	631,824.11	672,073.24	721,719.63	739,559.10	723,110.15	652,012.06	698,814.01	704,744.35	747,108.39	780,394.44	811,540.02	861,226.85
Italy	376,681.98	377,518.08	367,419.65	381,344.49	418,456.49	415,183.00	416,507.67	437,675.14	463,755.52	480,713.48	476,101.27	472,809.42	466,736.93	425,717.35	439,411.43	462,892.61	464,523.86	473,221.79
China	286,057.72	262,498.33	255,879.99	273,063.79	276,143.13	301,853.44	293,366.62	314,594.90	389,266.23	437,769.15	348,905.77	373,027.13	460,966.20	639,450.29	717,194.95	810,838.54	922,537.68	1,125,092.55
South Korea	81,336.36	92,562.49	96,702.51	111,482.71	129,299.50	133,826.98	160,471.87	190,668.12	208,551.41	225,126.38	254,995.39	275,573.04	285,051.61	307,049.52	341,369.70	387,160.11	419,665.40	427,853.19
Taiwan	93,793.29	98,029.39	97,143.40	108,015.36	123,636.01	130,990.90	154,831.81	164,209.86	183,779.81	184,518.86	180,921.44	194,607.40	196,760.63	212,630.14	218,058.81	231,665.05	239,271.88	260,186.99
Singapore	39,548.94	44,205.21	44,943.26	44,680.89	46,410.17	42,804.34	41,619.93	50,580.83	57,917.69	55,214.47	64,427.88	69,231.05	73,123.09	83,433.12	88,209.36	105,215.26	118,428.92	132,326.99
Hong Kong	54,164.12	62,613.95	57,546.78	66,918.28	69,848.61	61,779.31	72,673.16	81,426.90	93,461.45	82,349.57	92,564.60	100,491.32	103,404.68	93,575.22	105,388.57	118,405.15	126,560.69	142,443.23
All countries[b]	10,200,329.03	10,690,736.16	10,544,964.50	10,820,807.49	11,652,308.72	11,889,216.04	12,089,944.91	12,663,174.91	13,481,010.01	14,042,974.79	14,274,409.72	14,422,300.34	14,583,814.42	14,641,813.91	15,477,541.06	16,303,004.80	16,970,566.41	17,836,716.49
High-tech industries[c]																		
Production																		
United States	251,591.88	267,735.78	277,022.14	290,922.29	329,064.36	337,347.78	347,269.84	324,899.63	344,417.52	346,069.29	362,044.22	373,706.79	394,967.36	388,454.50	400,612.58	448,286.54	503,399.64	586,777.54
Canada	8,565.68	9,307.83	8,411.22	8,196.92	9,823.09	11,084.50	11,857.52	13,419.49	14,550.33	15,275.65	15,889.28	16,878.10	18,015.88	17,984.65	20,263.92	23,673.10	25,767.18	28,167.22
Japan	134,288.46	156,212.83	167,245.91	183,288.40	217,712.30	221,481.57	216,243.19	222,044.23	253,129.99	273,102.26	291,615.26	312,366.34	289,453.51	283,247.92	300,857.28	342,259.64	376,948.95	409,180.88
Germany[a]	51,525.08	57,447.83	60,198.15	65,375.68	69,848.34	69,409.49	69,675.13	68,512.14	72,171.37	81,735.32	87,222.25	93,373.89	89,512.25	98,845.77	108,035.75	110,346.45	111,673.58	108,460.37
France	26,970.42	31,745.73	32,741.84	32,818.52	37,020.94	37,028.73	37,019.59	39,100.30	43,559.54	46,724.44	50,276.56	51,285.58	50,710.29	48,452.28	49,435.35	51,518.82	52,746.56	56,540.47
United Kingdom	45,232.73	45,282.74	46,435.78	48,795.45	53,973.18	56,148.93	59,705.97	63,347.94	66,532.62	69,426.00	69,526.52	66,578.37	69,638.05	66,922.61	73,140.05	76,365.93	80,011.27	82,681.76
Italy	16,809.85	15,851.34	15,117.79	15,400.63	15,362.03	14,788.47	15,740.55	16,864.84	17,512.76	18,707.02	18,591.22	17,767.25	16,953.68	15,112.30	15,493.12	17,201.11	17,949.03	15,850.04
China	12,136.54	10,572.92	10,536.50	13,439.61	15,838.04	25,278.14	24,566.06	29,412.07	39,721.44	44,849.19	33,241.70	36,603.68	48,888.78	67,753.40	80,251.55	93,851.94	114,290.92	133,550.06
South Korea	5,890.36	7,017.95	7,357.95	9,401.34	12,437.51	12,397.74	17,172.69	22,369.59	26,896.99	26,945.29	30,264.48	31,162.11	32,484.46	37,521.72	45,077.42	59,331.51	62,692.39	69,137.63
Taiwan	6,497.89	7,030.29	7,177.20	8,922.15	11,355.29	11,878.60	17,294.78	20,615.27	23,517.56	24,450.49	24,996.74	26,866.11	27,213.04	33,307.89	31,605.22	35,870.73	39,525.14	44,302.73
Singapore	4,504.35	4,887.76	4,595.40	6,071.83	8,449.53	8,374.48	10,718.28	15,277.97	19,287.71	13,317.38	14,719.95	15,500.63	17,451.70	19,894.14	24,197.00	29,340.93	33,478.28	36,655.88
Hong Kong	4,104.63	5,504.49	5,110.79	6,120.21	6,319.56	4,684.86	6,425.08	8,440.56	8,950.02	7,284.84	5,855.68	4,962.41	5,615.72	5,502.16	5,193.23	5,941.07	6,504.56	7,111.67
All countries[b]	666,945.54	720,089.34	741,951.15	789,957.82	900,904.85	932,422.55	967,621.51	987,975.53	1,082,885.71	1,138,371.31	1,174,833.37	1,220,950.35	1,238,550.83	1,268,773.68	1,361,887.36	1,527,456.42	1,680,589.13	1,863,384.88
Exports																		
United States	37,059.44	40,631.28	35,492.46	39,301.75	39,511.63	43,579.12	47,923.20	54,752.99	65,142.71	74,964.30	85,412.43	93,789.69	100,006.69	95,420.33	104,670.27	114,188.41	125,740.48	138,765.19
Canada	2,391.13	3,087.63	3,429.86	3,363.82	4,138.58	4,602.91	5,232.26	5,167.66	5,235.72	5,916.90	7,161.15	8,368.90	8,439.03	7,956.78	9,198.32	11,388.96	13,310.07	15,139.24
Japan	19,960.55	25,540.61	25,867.74	30,649.89	39,878.78	41,292.28	41,601.74	41,673.07	48,943.92	53,110.04	55,290.49	58,075.04	57,243.16	54,479.45	57,377.32	63,072.22	65,071.00	69,415.00
Germany[a]	15,124.47	22,646.56	25,880.95	23,782.05	26,698.24	26,250.41	22,042.82	23,081.21	29,082.80	33,744.11	32,204.18	38,123.53	37,506.14	38,526.48	43,341.98	44,242.30	47,012.30	51,594.46
France	7,319.79	9,419.48	13,074.17	10,796.27	12,938.97	12,628.02	11,646.97	13,255.44	16,764.17	20,148.49	19,795.19	25,623.98	26,619.55	29,113.83	30,602.93	35,486.40	38,527.53	43,431.04
United Kingdom	19,763.18	18,838.56	20,428.05	21,220.95	22,911.78	25,163.41	29,750.45	23,627.31	29,421.08	30,401.27	33,042.85	45,827.07	41,999.96	45,191.25	46,403.31	53,616.19	58,193.97	63,466.28
Italy	3,625.48	5,092.67	5,525.75	5,431.81	6,314.57	6,872.30	6,370.29	6,370.07	7,852.33	8,418.18	9,141.37	9,133.70	10,130.32	10,900.39	11,465.06	12,638.52	13,279.62	14,162.81
China	376.64	406.10	408.73	464.40	753.91	539.74	821.16	1,062.47	2,137.89	2,045.98	3,835.31	4,365.90	5,929.35	6,260.55	8,571.32	10,887.92	11,827.38	12,757.83
South Korea	2,200.30	2,713.36	2,637.25	3,613.16	5,044.54	5,231.82	7,770.62	10,561.49	14,137.91	16,081.12	16,183.02	18,831.70	19,993.32	20,906.11	26,314.30	34,679.12	36,363.07	41,059.88
Taiwan	3,077.24	3,398.35	3,048.37	3,555.47	4,230.72	3,577.91	5,273.30	8,233.78	10,621.75	11,897.02	11,771.79	13,009.80	15,031.88	17,034.13	19,750.34	24,951.94	27,177.21	28,515.18
Singapore	3,791.25	3,587.58	3,628.81	4,403.04	5,400.43	5,794.75	7,347.46	10,622.95	15,845.15	18,812.41	20,596.18	23,513.21	27,062.42	32,678.02	46,204.62	56,211.07	60,168.70	61,433.22
Hong Kong	3,696.98	4,353.04	4,123.14	5,153.29	6,899.26	6,737.64	7,532.24	10,609.12	15,793.24	17,307.49	19,685.10	21,716.68	25,079.82	29,766.34	36,546.42	44,380.63	46,621.81	49,848.43
All countries[b]	147,338.03	171,936.40	176,144.24	187,109.27	213,866.90	223,176.18	237,074.97	257,110.50	313,397.98	355,577.87	381,490.62	434,708.77	466,151.59	497,820.48	570,667.02	654,495.47	706,380.34	766,371.00

See explanatory notes, if any, and SOURCE at end of table.

Imports

Appendix table 7-4.
Global industry and trade data, by selected countries and industries: 1980–97
(In millions of 1997 U.S. dollars)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Imports																		
United States	17,053.65	22,960.34	24,099.23	31,251.13	44,471.29	46,824.65	47,887.75	47,816.39	53,988.22	61,366.18	60,630.82	63,908.10	75,194.77	81,139.78	91,960.08	104,769.89	109,461.77	119,700.43
Canada	4,386.78	5,206.93	4,395.31	5,162.18	6,296.57	6,258.96	6,990.80	7,518.77	10,769.03	10,217.25	10,955.48	12,418.38	12,858.16	12,176.63	14,010.09	16,388.83	17,757.54	19,542.17
Japan	5,016.44	5,965.19	5,544.52	6,529.57	6,543.65	7,257.04	8,601.73	9,822.24	12,252.33	13,928.82	16,749.59	17,096.03	18,527.92	20,540.22	25,206.90	32,443.17	34,170.08	32,779.62
Germany[a]	10,884.57	13,742.45	14,000.59	14,648.35	15,113.12	16,153.80	18,509.57	20,196.48	23,478.95	26,602.25	33,503.35	36,566.76	36,367.06	35,637.76	40,029.09	42,471.06	45,739.47	48,975.90
France	7,414.25	11,663.99	14,139.41	11,363.18	12,941.62	12,508.04	11,479.02	13,025.96	19,764.22	23,755.98	24,565.74	31,848.97	27,630.75	26,824.53	27,734.31	28,296.73	30,024.84	32,630.95
United Kingdom	12,491.52	12,667.25	12,588.88	14,405.74	15,714.81	17,025.21	16,504.65	18,046.10	24,104.68	27,207.68	28,527.00	27,290.39	28,098.46	30,760.13	33,753.45	37,348.11	40,799.07	46,286.84
Italy	4,832.54	5,648.05	5,795.29	5,669.80	6,734.80	7,425.62	8,104.94	9,243.56	11,693.98	12,580.16	14,509.35	15,513.82	15,072.82	13,471.31	14,811.93	15,459.48	16,267.25	17,904.58
China	731.05	764.23	637.89	1,163.75	2,375.16	5,342.65	3,452.96	4,126.68	5,581.03	5,631.66	5,609.02	7,100.70	10,512.51	14,613.45	17,826.30	17,220.55	19,196.58	21,293.59
South Korea	2,211.99	2,485.92	2,485.01	3,495.23	4,655.54	4,247.54	4,905.50	6,161.08	8,918.88	9,448.45	9,850.30	11,889.39	12,417.72	12,892.92	15,136.53	19,105.27	21,209.08	22,848.71
Taiwan	2,147.00	2,482.72	2,826.16	2,920.21	3,574.30	3,338.43	4,236.65	5,771.42	7,347.45	8,914.75	9,562.98	11,760.09	13,985.83	15,477.51	16,638.49	21,134.83	22,534.15	25,709.34
Singapore	4,823.69	4,664.35	4,992.01	6,829.84	7,728.43	7,683.80	7,896.76	9,819.41	12,786.00	16,380.23	18,817.33	22,112.10	24,508.17	30,160.43	39,171.45	48,997.38	54,148.72	60,147.60
Hong Kong	4,210.92	4,561.10	4,566.85	5,471.80	7,605.17	6,953.73	7,959.06	10,508.07	15,766.94	16,030.49	20,584.68	24,971.12	30,512.08	30,697.81	36,195.29	47,005.90	51,135.70	57,178.79
All countries[b]	129,744.11	154,353.81	155,305.70	166,648.79	194,710.60	203,340.42	218,715.73	237,834.10	298,601.61	339,746.16	368,734.17	413,328.16	444,971.81	473,161.92	544,710.71	625,740.88	675,506.63	734,102.13
Apparent consumption																		
United States	226,223.59	244,065.78	263,999.31	282,424.77	331,864.05	343,843.08	361,042.19	334,799.55	357,121.00	365,260.79	374,413.09	384,294.09	413,222.02	403,371.12	463,021.13	518,439.00	569,842.87	645,694.69
Canada	10,563.80	11,566.95	9,856.40	10,624.50	12,899.56	13,854.47	15,257.64	17,598.58	22,212.47	22,174.66	22,722.83	24,303.91	25,945.52	25,172.73	29,860.45	31,879.61	34,401.81	36,148.98
Japan	121,819.24	139,887.44	150,244.77	162,757.75	188,197.11	193,161.75	193,544.73	206,400.54	236,938.65	260,643.45	286,850.48	313,029.55	295,011.56	283,157.06	301,943.91	348,025.98	402,647.46	422,756.97
Germany[a]	55,010.66	59,743.00	61,598.95	68,359.92	72,131.94	72,501.18	77,312.94	77,375.77	81,272.43	91,556.91	105,197.13	111,983.85	108,251.38	116,490.24	127,725.13	136,586.23	143,874.82	150,417.13
France	30,633.38	38,373.42	41,896.48	38,622.15	43,566.38	42,525.69	41,317.99	43,961.42	53,498.70	59,973.26	63,010.05	70,222.54	63,174.01	58,622.86	60,479.42	60,717.69	62,395.11	64,783.02
United Kingdom	41,134.31	42,068.50	42,168.80	46,156.05	51,658.26	54,904.72	55,209.65	66,033.96	72,467.26	79,524.88	80,721.30	67,162.76	74,889.74	72,197.22	81,207.27	84,090.42	88,994.25	96,604.31
Italy	19,624.32	18,687.36	17,748.47	18,131.42	18,742.29	18,126.81	20,151.69	22,576.85	25,088.69	26,706.12	28,241.42	28,305.54	26,438.12	22,209.02	23,571.42	24,969.78	25,832.90	26,998.39
China	12,602.92	11,039.63	10,885.29	14,283.46	17,753.68	30,379.38	27,487.32	32,847.13	43,671.21	48,928.59	35,704.98	40,156.42	54,539.17	77,299.88	91,057.53	102,007.82	123,649.87	150,174.29
South Korea	6,169.59	7,187.00	7,428.64	9,754.25	12,847.27	12,544.66	16,089.67	20,195.47	24,679.32	23,939.92	27,875.14	28,620.83	29,674.73	33,937.06	37,908.01	44,890.36	55,868.49	60,142.89
Taiwan	6,197.75	6,813.96	7,592.92	9,031.78	11,564.02	12,347.94	17,310.38	19,560.28	21,829.54	22,979.19	23,984.53	26,661.90	27,007.70	32,842.46	29,713.27	33,451.81	36,314.86	42,261.19
Singapore	6,040.74	6,417.29	6,503.74	9,083.80	11,382.47	10,984.56	12,341.56	16,259.28	18,996.94	14,024.00	16,067.37	17,893.14	18,909.64	22,846.05	24,092.46	30,874.61	37,304.13	46,027.86
Hong Kong	5,549.44	6,802.65	6,622.01	7,670.50	8,707.97	6,589.22	8,769.52	11,152.34	13,082.80	10,551.92	11,754.89	13,599.14	17,153.76	13,686.05	14,411.30	20,077.74	23,049.37	27,737.17
All Countries[b]	675,436.63	734,957.26	765,329.19	815,264.64	931,575.24	970,993.04	1,026,073.18	1,060,545.32	1,186,120.36	1,268,407.25	1,324,980.30	1,387,951.94	1,421,611.75	1,432,802.24	1,584,056.76	1,767,583.33	1,963,090.56	2,159,342.30
Aerospace																		
Production																		
United States	108,659.15	115,068.86	114,288.52	117,949.99	128,435.03	136,567.37	143,733.69	148,582.28	151,112.33	146,613.14	153,666.07	155,247.53	150,418.36	128,959.83	112,219.52	106,315.22	123,043.64	146,331.85
Canada	3,147.53	3,384.57	2,523.53	2,221.97	2,795.34	3,206.26	3,617.12	3,896.33	4,393.16	4,749.71	5,175.40	4,729.98	4,376.93	4,043.64	4,522.10	5,880.39	5,955.98	6,325.88
Japan	4,308.64	4,975.59	5,154.90	5,296.78	5,713.60	6,359.39	5,845.76	6,942.31	7,354.08	7,058.87	7,073.33	6,942.16	7,373.36	7,438.86	7,017.24	6,860.44	7,408.87	7,792.83
Germany[a]	6,165.26	6,945.46	6,825.65	6,700.99	6,782.73	7,891.18	7,574.96	8,801.98	9,109.79	12,233.11	12,906.40	12,900.02	10,910.48	10,258.18	10,481.84	10,388.79	10,777.72	10,856.44
France	8,239.34	10,387.42	10,704.85	10,985.02	12,598.21	11,824.48	11,098.50	11,375.47	12,822.50	13,849.33	14,773.98	14,555.45	14,456.88	13,329.51	13,109.41	12,943.39	13,449.82	14,909.92
United Kingdom	18,082.44	18,068.93	17,394.43	17,930.99	17,953.21	19,390.16	22,278.41	23,705.92	23,614.61	25,106.31	25,296.17	24,046.04	25,232.96	23,321.54	23,839.34	24,125.03	25,571.51	27,054.83
Italy	4,430.32	4,296.46	4,275.40	3,938.49	4,017.68	4,095.13	4,391.29	4,387.84	5,445.19	5,629.44	4,686.20	4,260.74	3,921.12	3,493.54	3,603.72	3,627.59	3,742.01	3,906.57
China	4,836.12	3,721.17	3,729.51	4,732.21	4,752.25	6,999.71	6,450.14	7,594.56	7,990.68	9,921.99	5,969.39	6,924.17	14,024.50	21,825.54	27,399.86	30,422.89	37,643.08	45,130.97
South Korea	1.96	2.68	3.25	3.85	4.70	5.21	5.64	7.04	7.70	8.61	11.14	658.62	476.94	420.93	455.03	532.66	606.67	685.53
Taiwan	291.83	305.34	301.84	266.16	282.07	322.38	418.50	415.04	402.69	465.05	451.38	519.97	479.92	544.61	510.43	578.94	573.79	634.86
Singapore	210.42	226.48	289.96	384.13	446.01	611.29	633.07	674.26	732.72	560.00	654.34	660.60	913.12	932.76	941.35	1,033.70	1,100.52	1,146.07
Hong Kong	0.55	0.78	0.77	1.42	1.35	1.39	2.24	3.06	5.23	4.52	4.95	312.44	358.06	329.16	313.08	375.47	417.60	462.56
All countries[b]	168,515.25	178,913.18	176,959.57	181,654.72	197,261.77	211,571.02	220,520.86	230,621.55	240,346.59	246,248.06	249,838.81	250,312.80	252,849.04	233,541.51	223,228.63	223,009.77	251,729.36	288,471.61

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-4.
Global industry and trade data, by selected countries and industries: 1980–97
(In millions of 1997 U.S. dollars)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Exports																		
United States	22,594.51	25,138.51	19,709.16	20,015.92	17,607.27	22,658.25	24,443.59	28,277.95	31,631.03	38,331.25	43,852.73	48,320.59	49,214.45	39,554.93	37,052.13	30,823.65	36,864.70	43,001.63
Canada	1,132.88	1,403.45	1,682.58	1,363.37	1,395.99	1,753.27	2,458.90	2,189.95	2,262.56	2,514.21	3,339.52	3,932.79	2,950.44	2,477.17	2,642.56	3,383.32	4,046.01	4,564.36
Japan	153.18	229.28	326.40	285.08	260.23	228.12	225.46	324.55	459.39	624.32	599.40	697.30	746.87	600.30	592.11	522.49	830.08	916.18
Germany[a]	3,686.22	9,450.06	12,260.77	9,982.26	11,173.41	9,353.67	4,731.68	5,113.92	8,029.93	11,438.71	9,995.66	13,321.63	12,873.80	11,441.43	10,780.03	9,864.54	10,017.75	11,542.72
France	2,285.40	3,685.42	4,654.55	4,203.19	5,799.63	4,709.92	3,595.38	4,328.92	6,786.98	9,419.42	8,175.81	12,440.86	12,795.02	12,980.69	13,158.98	14,530.22	15,834.84	18,242.11
United Kingdom	13,463.58	11,831.73	12,862.35	13,516.56	14,072.91	15,148.31	18,730.36	11,687.26	14,432.83	13,028.26	14,322.86	25,418.99	20,698.75	18,049.43	15,368.17	15,565.27	16,636.72	18,585.13
Italy	659.73	1,895.26	2,034.83	1,804.89	2,123.74	2,066.59	1,634.28	1,591.99	2,239.28	2,625.42	3,401.36	3,134.24	3,266.37	2,482.28	2,447.03	1,999.00	2,199.30	2,447.52
China	1.11	2.42	2.48	6.47	59.15	29.54	44.01	7.53	18.11	17.81	29.58	46.02	411.39	202.82	221.11	181.96	202.45	231.24
South Korea	221.34	284.30	105.04	155.72	272.44	458.64	562.62	130.04	199.57	325.48	303.08	380.13	406.51	419.70	406.46	480.82	589.53	668.40
Taiwan	0.99	0.93	0.48	0.25	1.23	2.38	1.41	3.34	5.72	19.36	24.10	70.40	38.56	54.61	49.57	65.39	70.11	76.31
Singapore	281.27	251.59	176.64	413.36	346.87	798.95	287.57	327.30	376.55	1,016.12	682.90	518.89	509.97	352.47	380.23	645.44	727.68	799.16
Hong Kong	85.96	37.38	51.02	92.69	66.88	85.49	132.57	97.04	134.48	106.38	137.18	113.25	155.60	130.21	120.22	157.71	177.60	196.99
All countries[b]	48,039.93	58,724.83	58,290.57	56,282.90	58,457.98	62,251.37	62,926.28	60,229.81	73,808.03	89,910.31	95,392.28	119,555.96	116,789.97	102,291.35	96,915.31	92,528.12	104,459.71	119,737.13
Imports																		
United States	4,146.18	5,909.33	5,482.09	5,272.28	7,099.59	9,368.03	9,820.15	8,085.11	10,211.74	10,838.34	12,339.23	12,565.28	13,168.42	12,302.01	11,710.48	12,069.63	13,922.30	15,322.70
Canada	1,790.66	2,136.50	1,332.83	1,514.20	1,634.80	2,067.57	2,207.57	2,250.35	4,482.91	3,252.64	2,762.95	2,942.59	2,895.30	1,918.07	1,665.07	2,126.19	2,365.32	2,628.51
Japan	1,858.03	2,342.77	1,724.92	2,452.63	1,869.30	2,667.27	2,972.89	2,996.89	3,233.48	3,205.17	4,882.19	4,738.05	5,401.42	4,146.27	4,306.48	3,199.77	3,363.00	3,904.62
Germany[a]	1,932.98	4,535.82	4,172.12	4,469.57	3,945.75	4,122.38	4,659.10	4,454.49	5,637.53	7,111.75	9,475.44	9,452.79	9,732.13	7,860.83	7,076.99	5,125.83	5,687.65	6,695.76
France	2,677.30	6,322.70	8,630.13	6,099.81	7,048.29	6,277.89	4,150.93	4,642.86	8,923.91	12,273.65	11,486.71	18,029.02	13,845.44	11,626.49	10,441.61	8,334.66	9,038.73	10,563.28
United Kingdom	6,795.00	5,142.57	3,740.33	4,823.71	5,414.96	6,079.33	4,946.28	4,343.98	6,887.35	7,626.63	9,168.94	7,711.49	7,210.87	6,796.00	7,259.47	5,970.48	7,089.51	8,497.17
Italy	997.48	1,641.55	1,319.30	1,480.92	1,756.34	1,711.88	1,506.49	1,366.52	1,719.84	1,811.16	2,418.84	2,741.77	2,301.98	1,713.82	1,936.65	1,866.21	1,891.00	2,215.69
China	245.14	22.85	58.60	375.07	193.77	1,066.35	844.13	881.17	615.41	996.36	1,096.40	1,479.82	3,324.33	3,646.51	4,313.17	2,355.68	2,832.59	3,241.29
South Korea	648.64	783.13	494.98	564.68	1,145.20	986.35	896.05	926.70	2,128.16	2,195.50	1,818.47	2,791.87	2,888.77	2,893.00	2,871.85	3,234.68	3,135.16	3,642.78
Taiwan	450.18	539.32	978.82	609.25	528.90	665.53	349.28	269.27	278.58	834.51	869.62	1,963.63	2,104.06	2,788.83	2,377.23	2,782.25	2,146.83	2,457.02
Singapore	1,510.90	972.77	883.65	1,629.00	1,791.95	2,026.91	1,285.06	1,187.34	1,080.73	2,653.40	2,000.13	2,780.04	2,796.45	3,241.06	2,867.89	2,940.97	3,033.07	3,364.74
Hong Kong	573.84	317.73	575.88	494.19	547.74	564.02	1,264.93	897.16	538.19	899.27	1,324.11	1,462.39	1,455.92	1,756.11	1,133.22	3,378.56	4,040.22	4,612.79
All countries[b]	37,148.87	47,801.98	44,485.71	42,725.09	45,290.12	49,193.17	50,649.96	48,144.89	66,034.97	82,168.84	89,779.32	104,288.07	102,762.36	90,478.17	86,246.36	81,146.91	90,310.91	103,742.08
Apparent consumption																		
United States	90,268.85	96,325.10	102,508.71	104,749.13	118,146.29	127,370.87	139,127.10	137,912.82	144,853.38	140,936.01	146,287.57	144,853.38	139,395.38	118,723.48	137,897.84	138,179.86	133,987.40	142,696.52
Canada	3,807.83	4,166.51	2,436.54	2,571.06	3,212.62	3,815.56	3,989.58	4,502.76	7,341.39	6,415.85	5,704.93	4,935.09	5,221.78	4,097.99	5,088.53	5,345.55	5,413.39	5,764.66
Japan	5,842.19	6,906.89	6,391.19	7,282.74	7,112.64	8,546.35	8,588.72	9,626.67	10,496.72	10,294.32	11,914.28	11,553.39	12,590.42	11,174.33	10,918.06	9,703.41	10,198.69	11,061.31
Germany[a]	6,104.33	6,367.91	4,854.69	5,764.43	4,669.62	6,936.35	9,665.68	10,481.45	10,387.83	13,131.86	16,946.04	15,081.81	13,617.62	11,885.09	11,681.33	10,135.56	11,004.01	11,671.05
France	10,967.32	16,194.87	19,509.64	15,512.47	17,454.21	15,525.15	12,437.27	12,900.10	17,453.18	20,661.48	19,781.99	25,637.29	18,807.37	14,675.11	13,596.56	10,618.32	10,983.16	11,804.75
United Kingdom	14,534.59	14,043.44	11,251.72	12,171.23	12,488.02	14,590.40	13,760.76	19,639.91	20,849.76	25,086.18	26,196.82	15,231.75	19,302.51	18,746.96	21,684.62	20,556.65	22,447.97	24,196.63
Italy	5,013.28	4,747.28	4,316.49	4,285.49	4,438.85	4,506.91	4,868.80	4,751.09	5,752.10	5,782.58	4,955.69	5,021.31	4,158.02	3,638.51	3,993.33	4,229.02	4,240.93	4,542.95
China	5,080.25	3,741.82	3,785.87	5,101.48	4,893.34	8,039.93	7,255.57	8,469.15	8,590.38	10,902.97	7,040.39	8,364.67	16,999.40	25,300.73	31,527.20	32,626.31	40,306.99	48,179.81
South Korea	648.84	783.40	495.31	565.06	1,145.67	986.87	896.62	927.40	2,128.93	2,196.36	1,819.58	3,149.21	3,043.68	2,981.58	3,004.87	3,386.22	3,274.45	3,843.29
Taiwan	741.21	843.91	1,280.27	875.21	809.99	986.00	766.65	681.63	676.68	1,283.98	1,301.61	2,426.93	2,552.92	3,289.42	2,847.68	3,304.54	2,706.45	3,108.70
Singapore	1,473.15	973.55	1,011.99	1,649.07	1,924.66	1,955.94	1,685.12	1,591.51	1,541.90	2,427.43	2,127.04	3,048.15	3,314.14	3,909.49	3,558.06	3,506.35	3,599.87	3,880.26
Hong Kong	511.78	291.24	539.44	427.95	500.20	502.94	1,170.09	828.95	444.48	825.49	1,228.04	1,691.34	1,699.08	1,988.97	1,357.38	3,637.31	4,326.38	4,914.82
All countries[b]	166,163.85	180,875.30	181,823.63	181,886.70	199,092.31	216,050.64	230,229.09	238,138.99	263,324.42	281,639.27	287,683.57	288,282.64	288,169.88	261,192.55	287,468.64	285,868.07	297,926.48	326,133.84

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-4.
Global industry and trade data, by selected countries and industries: 1980–97
(In millions of 1997 U.S. dollars)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Office and computing machinery																		
Production																		
United States	2,877.29	3,200.87	4,066.40	5,416.09	8,529.31	10,010.80	10,993.50	13,663.29	16,435.86	17,081.09	18,640.23	19,206.28	25,564.77	30,575.35	39,512.99	53,237.77	78,005.12	109,101.18
Canada	71.11	91.21	106.08	128.06	209.19	278.43	306.38	386.68	547.06	601.54	692.63	799.02	1,036.80	1,240.04	2,130.14	2,185.66	2,979.58	3,413.62
Japan	4,737.75	5,359.23	5,876.68	6,238.43	7,201.58	8,096.99	9,174.64	11,829.72	14,361.53	18,307.73	23,517.52	28,262.77	31,381.17	33,893.16	31,763.49	41,855.80	59,169.01	69,303.71
Germany[a]	1,303.28	1,532.74	1,754.88	2,191.73	2,822.80	2,539.59	2,228.58	2,018.81	2,156.02	2,227.43	2,328.67	3,206.53	2,824.51	3,209.61	3,580.08	3,656.96	3,710.68	3,863.43
France	955.70	1,037.71	1,032.64	1,212.77	1,404.98	1,476.53	1,539.44	1,676.87	1,710.20	1,806.18	1,762.44	1,917.50	2,001.60	2,071.83	2,167.10	2,341.24	2,373.33	2,556.05
United Kingdom	253.76	239.78	326.75	526.99	957.74	1,456.52	1,575.08	2,217.00	3,023.79	3,674.53	4,134.49	4,496.35	5,484.75	5,613.12	6,472.25	6,633.89	6,704.67	6,718.99
Italy	533.65	559.02	530.83	743.01	864.03	577.72	571.79	593.48	1,092.98	1,203.52	1,254.50	1,039.22	976.11	999.82	999.54	1,213.60	1,252.42	1,257.48
China	76.24	65.34	69.39	83.32	102.55	96.67	105.26	117.11	144.15	141.16	106.99	118.81	152.72	203.62	243.17	286.41	330.82	371.64
South Korea	4.42	5.60	5.50	22.07	56.99	90.49	179.08	209.73	313.30	352.48	426.81	506.24	602.03	1,369.42	1,800.88	2,909.26	4,800.30	5,309.62
Taiwan	53.38	64.16	71.03	120.61	212.35	242.98	495.81	732.13	811.07	855.33	930.23	1,001.55	1,034.62	1,174.26	1,191.18	1,399.45	1,558.10	1,836.36
Singapore	24.94	28.07	51.33	135.12	237.61	286.96	497.42	776.00	1,277.28	1,609.07	2,179.27	2,450.21	3,320.49	5,389.44	7,280.34	9,513.27	11,472.70	13,067.70
Hong Kong	17.66	24.94	29.67	92.23	163.68	114.35	151.76	225.33	410.01	565.13	1,085.26	1,268.33	1,322.50	1,288.10	1,211.64	1,567.02	1,863.77	2,233.49
All countries[b]	12,440.53	13,841.07	15,620.71	18,809.95	25,459.53	28,454.41	31,531.29	38,343.04	46,503.79	53,800.13	62,721.63	70,336.93	82,350.49	94,272.18	106,642.47	136,742.52	184,880.81	230,758.61
Exports																		
United States	2,091.02	2,361.67	2,491.39	2,856.82	3,597.60	3,790.65	4,017.05	4,753.89	5,827.80	6,043.17	6,483.78	6,821.52	7,264.58	7,241.16	8,258.39	9,874.60	10,753.24	11,405.34
Canada	142.44	174.73	190.24	221.03	281.21	291.07	306.14	398.60	507.54	473.69	531.65	620.31	713.04	742.61	993.02	1,275.13	1,102.01	1,251.07
Japan	546.07	646.41	857.42	1,390.10	2,050.78	2,214.48	2,721.61	3,171.68	3,946.74	4,290.92	4,646.40	4,732.76	5,109.58	5,107.69	5,113.85	5,331.78	5,613.29	6,083.67
Germany[a]	637.57	799.28	872.20	1,035.40	1,228.25	1,577.26	1,589.97	1,564.17	1,673.98	1,866.41	1,839.53	1,966.34	1,826.87	1,962.57	2,192.77	2,452.59	2,544.61	2,717.10
France	328.94	414.01	413.75	525.59	645.78	725.38	809.51	943.86	995.40	1,083.79	1,031.89	1,165.74	1,235.89	1,293.30	1,403.62	1,694.94	1,847.55	2,048.66
United Kingdom	559.99	554.65	658.81	818.16	1,204.22	1,465.26	1,471.85	1,796.89	2,290.84	2,626.94	2,631.25	2,734.92	2,709.17	3,276.98	3,639.49	4,490.87	4,828.29	5,181.82
Italy	352.19	284.92	328.47	354.05	418.71	626.46	592.37	579.78	737.58	881.35	797.00	800.62	759.19	981.91	988.83	1,119.97	1,123.61	1,177.45
China	1.33	0.77	0.98	2.22	3.58	2.05	8.93	15.47	42.59	36.99	75.98	103.31	218.36	313.23	467.98	827.91	946.49	1,040.52
South Korea	19.34	22.83	31.77	62.20	120.16	163.65	273.41	408.79	647.17	729.36	672.35	722.06	756.19	864.05	867.13	1,163.22	1,294.92	1,337.86
Taiwan	45.91	59.20	68.02	114.94	222.78	283.95	520.18	981.48	1,417.50	1,814.84	2,200.85	2,685.71	3,364.84	3,610.24	4,085.74	5,204.23	5,824.68	6,230.77
Singapore	37.75	42.50	77.70	204.56	359.71	434.41	753.03	1,174.76	1,933.64	2,441.34	3,091.16	3,459.83	4,447.89	5,747.84	7,412.55	9,224.70	10,415.66	10,985.32
Hong Kong	179.71	224.93	204.01	369.36	609.24	522.40	503.99	673.88	984.86	1,081.88	1,254.34	1,531.83	1,928.66	2,082.03	2,398.15	3,345.52	3,529.35	3,789.33
All countries[b]	5,819.33	6,663.46	7,405.85	9,477.04	12,721.28	14,491.41	16,062.93	19,321.86	24,359.78	27,503.62	29,656.82	32,279.15	35,936.47	40,250.75	46,339.82	56,817.64	62,192.37	66,853.48
Imports																		
United States	621.20	812.48	1,048.36	1,748.45	2,625.20	2,902.82	3,405.64	4,160.16	5,177.58	6,017.74	6,272.59	6,792.15	8,086.35	9,385.84	10,698.20	12,228.41	13,235.21	14,390.13
Canada	277.98	369.93	392.64	447.91	646.61	635.68	644.84	805.34	919.91	982.83	1,124.86	1,283.29	1,398.68	1,458.74	1,633.94	1,862.97	2,036.30	2,225.45
Japan	201.39	224.83	241.58	262.41	315.81	381.69	438.61	527.55	721.02	888.22	1,004.65	1,102.36	1,171.42	1,395.17	1,787.71	2,994.50	3,287.44	3,333.51
Germany[a]	677.64	733.31	758.87	956.50	1,167.98	1,422.47	1,636.51	1,929.57	2,238.53	2,639.40	3,040.62	3,440.14	3,587.92	3,617.11	3,973.29	4,787.79	5,206.67	5,540.13
France	517.11	573.43	664.61	777.58	893.54	1,027.32	1,191.66	1,326.52	1,626.99	1,689.72	1,699.23	1,684.77	1,795.34	1,931.46	2,234.84	2,635.44	2,780.78	2,907.91
United Kingdom	760.36	858.85	995.92	1,276.03	1,611.11	1,713.20	1,795.89	2,246.79	2,859.13	3,266.76	3,306.44	3,313.78	3,541.61	4,016.99	4,154.19	4,827.08	5,246.99	6,021.55
Italy	306.97	342.71	333.41	367.46	518.19	634.33	691.19	857.86	1,030.57	1,002.83	1,055.93	1,127.11	1,152.40	1,077.06	1,087.25	1,285.11	1,375.06	1,508.42
China	24.00	24.76	31.65	40.03	166.36	200.66	142.92	196.15	184.65	169.44	168.97	231.76	324.59	447.14	547.39	767.30	834.29	922.51
South Korea	39.15	43.08	67.02	102.57	105.43	145.62	224.98	225.88	334.81	374.32	430.68	457.22	399.67	452.28	598.39	798.20	917.94	897.24
Taiwan	34.46	44.95	55.28	71.88	98.82	109.52	165.51	227.16	332.61	384.03	426.51	474.51	544.70	544.42	630.98	794.80	872.17	984.42
Singapore	70.39	89.15	133.53	218.70	276.78	313.76	361.21	565.16	863.98	1,016.08	1,399.47	1,551.04	1,836.39	2,335.24	2,885.23	3,571.13	3,987.79	4,383.59
Hong Kong	179.68	170.20	169.38	246.01	395.94	359.58	302.45	419.28	642.50	641.52	787.08	972.21	1,413.02	1,344.66	1,693.92	2,372.63	2,602.66	2,892.09
All countries[b]	5,773.98	6,626.37	7,374.54	9,462.31	12,621.27	14,400.92	15,852.12	19,007.19	23,826.70	26,729.85	28,819.72	31,326.30	34,754.13	38,602.25	44,296.29	53,872.84	58,911.92	63,709.23

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-4.
Global industry and trade data, by selected countries and industries: 1980–97
(In millions of 1997 U.S. dollars)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Apparent consumption																		
United States	1,407.47	1,651.68	2,623.37	4,307.72	7,556.92	9,122.97	10,382.09	13,069.57	15,785.64	17,055.66	18,429.04	19,176.90	26,386.55	32,720.03	41,952.80	55,591.58	80,487.09	112,085.96
Canada	371.97	515.55	555.27	638.91	1,034.24	1,121.49	1,161.15	1,428.16	1,726.97	1,999.22	2,314.53	2,631.60	3,100.39	3,521.09	4,987.90	4,992.29	7,044.96	7,898.41
Japan	7,907.53	8,887.79	9,469.53	9,199.33	9,839.89	11,275.56	12,404.97	16,534.06	20,044.46	26,829.05	35,776.38	44,338.25	49,397.41	54,325.15	51,187.24	71,133.35	102,317.69	119,796.38
Germany[a]	2,418.02	2,640.17	2,954.78	3,803.09	4,972.55	4,292.63	4,095.22	4,291.56	4,897.04	5,400.74	6,353.58	8,424.60	8,254.00	8,755.47	9,649.07	10,785.89	11,470.94	12,035.63
France	2,058.97	2,154.82	2,310.30	2,636.58	2,974.93	3,201.24	3,458.87	3,707.15	4,215.22	4,341.79	4,373.61	4,385.74	4,609.89	4,877.97	5,396.99	5,907.12	5,951.81	6,147.54
United Kingdom	817.41	979.17	1,194.95	1,772.74	2,456.33	3,068.03	3,418.43	4,800.42	6,465.74	7,765.83	8,657.42	9,135.37	11,370.95	11,435.64	12,576.52	12,546.20	12,822.06	13,605.69
Italy	879.17	1,110.27	964.39	1,361.57	1,734.32	1,054.04	1,207.10	1,568.82	2,494.76	2,385.00	2,724.18	2,458.28	2,464.78	1,970.95	1,976.32	2,481.73	2,706.97	2,859.21
China	178.02	160.80	180.11	218.03	477.59	531.52	430.65	536.02	515.18	492.50	359.96	445.07	466.12	607.55	580.64	406.44	393.52	456.53
South Korea	43.63	46.54	73.35	112.39	76.07	130.42	235.16	48.26	1.70	-4.60	333.25	434.53	441.93	1,723.78	2,757.84	4,579.63	7,961.96	8,764.19
Taiwan	75.48	89.84	104.92	139.59	159.09	123.39	254.05	-39.95	-492.89	-1,035.86	-1,519.40	-2,177.37	-3,213.93	-3,404.80	-4,074.44	-5,417.97	-6,109.93	-6,137.99
Singapore	103.64	134.51	192.88	268.69	278.44	299.35	190.09	299.53	373.71	330.86	877.66	974.55	1,276.18	3,558.31	4,955.44	6,947.45	9,080.71	11,638.75
Hong Kong	88.14	68.89	85.86	145.84	196.82	126.15	105.90	147.06	300.08	343.65	683.88	692.68	758.65	505.59	647.35	846.70	1,141.70	1,534.65
All countries[b]	21,268.00	23,689.43	26,100.85	30,655.69	39,969.70	44,046.83	48,368.78	58,279.23	70,381.45	82,056.45	96,358.45	109,115.36	124,450.48	140,170.67	154,582.50	196,293.28	262,120.61	319,340.71
Communications equipment																		
Production																		
United States	100,215.50	106,031.37	114,051.66	122,871.69	146,666.19	144,256.71	143,456.26	108,668.52	119,404.26	121,632.82	125,789.35	129,834.77	145,080.34	153,907.02	168,910.43	205,552.20	211,515.36	237,206.19
Canada	3,464.06	3,561.76	3,536.39	3,656.01	4,429.70	4,754.91	5,002.36	5,719.16	6,113.01	6,565.37	6,402.18	7,703.33	8,778.63	8,616.57	9,406.14	11,071.01	12,038.60	13,417.37
Japan	98,339.52	116,439.09	124,276.33	137,711.61	170,180.20	171,299.81	164,902.01	163,537.45	190,014.07	204,427.90	217,278.30	233,260.95	206,744.40	197,285.20	215,512.64	243,422.06	260,698.42	282,160.20
Germany[a]	31,348.58	33,554.73	35,162.39	38,925.32	40,778.92	39,784.34	42,085.13	41,406.81	44,323.30	49,250.13	54,416.91	59,213.85	58,422.57	67,669.81	74,496.89	76,606.82	76,402.19	71,288.00
France	11,959.86	13,131.05	13,778.87	13,604.26	15,878.77	16,391.71	16,887.46	18,496.26	20,877.13	22,551.56	24,872.74	25,808.08	24,779.34	23,382.57	24,358.34	25,948.72	26,096.92	27,407.93
United Kingdom	16,605.65	16,482.58	17,556.40	19,814.73	23,819.20	23,801.13	23,740.45	24,436.34	26,128.47	26,594.96	25,990.63	23,543.85	23,232.80	22,216.53	26,000.40	27,584.86	28,556.25	29,705.18
Italy	6,165.74	6,038.85	6,280.59	6,870.28	6,504.79	6,411.27	7,062.24	7,975.57	8,297.87	9,389.22	9,530.79	9,588.28	9,142.70	8,412.91	8,670.91	9,944.55	10,370.99	7,909.05
China	6,435.34	5,694.88	5,375.45	6,627.31	8,995.43	16,510.08	15,708.86	18,496.40	26,523.75	30,115.02	23,112.48	25,093.95	30,339.89	41,485.67	47,785.84	57,721.09	70,218.43	81,326.26
South Korea	4,078.33	5,113.54	5,200.39	7,194.73	9,901.92	9,765.48	14,234.79	19,283.89	22,723.35	23,378.53	25,925.14	26,328.57	27,529.61	31,665.93	38,447.09	51,500.39	52,851.41	58,504.36
Taiwan	5,844.47	6,316.20	6,366.97	8,093.72	10,359.06	10,750.14	15,684.00	18,910.65	21,678.32	22,598.75	23,069.90	24,786.13	25,098.95	30,963.27	29,278.27	33,235.25	36,700.88	41,087.59
Singapore	3,963.09	4,289.17	3,910.37	5,161.52	7,246.56	6,989.43	8,921.40	13,062.39	16,521.20	10,344.47	11,062.43	11,290.22	12,195.73	12,564.33	15,064.20	17,814.82	19,879.81	21,387.23
Hong Kong	3,947.28	5,302.88	4,925.57	5,926.25	6,008.75	4,446.34	6,125.84	8,061.18	8,375.42	6,560.52	4,628.96	3,225.08	3,773.05	3,697.65	3,472.02	3,790.87	4,005.25	4,188.48
All countries[b]	334,972.79	364,123.08	382,851.42	421,179.99	500,649.43	511,175.13	527,933.97	518,672.08	584,237.62	621,283.45	637,351.29	666,024.96	662,432.27	695,070.47	769,025.08	892,328.61	952,775.17	1,038,979.77
Exports																		
United States	8,149.27	8,634.03	8,697.65	11,807.17	13,657.49	12,663.89	14,202.47	16,638.12	21,767.91	25,425.53	29,719.99	33,033.95	37,247.87	42,262.61	52,689.45	66,365.55	70,265.61	76,179.48
Canada	936.93	1,249.42	1,307.19	1,507.93	2,225.88	2,329.75	2,204.43	2,286.93	2,216.02	2,710.76	3,020.88	3,538.34	4,389.02	4,330.20	5,044.76	6,104.84	7,472.45	8,588.48
Japan	18,649.41	24,001.05	24,030.31	28,280.54	36,892.67	38,128.61	37,854.12	37,362.10	43,648.68	47,266.98	49,021.94	51,530.86	50,128.36	47,576.80	50,510.84	55,872.05	57,123.71	60,789.28
Germany[a]	6,500.53	7,382.37	7,747.73	7,863.82	9,139.74	9,910.97	10,155.04	10,812.38	12,843.62	13,958.58	13,872.24	15,566.03	15,324.04	16,594.97	20,840.53	22,016.71	23,778.95	25,971.56
France	2,267.81	2,538.89	2,716.22	3,168.51	3,607.64	4,168.11	4,106.43	4,859.34	5,578.03	5,957.94	6,840.17	7,951.27	8,006.79	9,357.30	10,532.63	12,935.76	14,104.56	15,833.23
United Kingdom	2,664.46	2,984.31	3,287.17	3,467.07	4,144.85	4,829.27	5,256.51	5,941.41	8,039.00	9,803.47	11,055.32	12,250.22	12,630.13	16,873.62	20,416.73	25,104.76	27,219.71	29,552.57
Italy	1,378.34	1,481.35	1,712.45	1,826.73	2,227.03	2,466.97	2,495.94	2,637.86	3,155.15	3,354.80	3,440.05	3,628.89	3,859.74	4,677.03	5,136.37	5,947.38	6,129.86	6,478.24
China	61.14	81.18	94.45	139.47	351.66	102.93	281.90	525.81	1,449.26	1,298.16	2,961.71	3,348.78	4,332.23	4,793.37	6,717.88	8,356.78	8,990.75	9,657.67
South Korea	1,921.07	2,352.10	2,444.69	3,339.67	4,589.14	4,533.75	6,819.08	9,905.17	13,173.51	14,888.71	15,062.36	17,555.40	18,624.92	19,412.67	24,798.29	32,759.88	34,171.03	38,722.25
Taiwan	2,982.80	3,269.73	2,919.17	3,383.98	3,955.98	3,245.63	4,693.40	7,178.46	9,114.35	9,961.68	9,452.65	10,144.64	11,511.00	13,276.17	15,515.58	19,580.45	21,176.28	22,103.08
Singapore	3,177.94	3,006.33	3,054.37	3,485.18	4,456.55	4,302.83	6,006.55	8,827.94	13,181.33	15,011.90	16,474.12	19,183.88	21,709.07	26,019.95	37,727.30	45,538.35	48,166.38	48,745.33
Hong Kong	3,050.10	3,635.20	3,421.18	4,247.00	5,815.01	5,683.95	6,334.80	9,112.58	13,784.35	15,279.05	17,401.51	18,947.58	21,721.16	26,412.79	32,789.19	39,430.33	41,326.50	44,135.57
All countries[b]	65,840.76	75,320.19	76,531.89	90,122.78	111,105.86	113,447.00	122,114.99	141,111.14	173,331.40	196,547.70	213,322.48	235,446.56	260,563.50	293,978.51	361,551.76	431,937.30	459,421.07	493,778.09

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-4.
Global industry and trade data, by selected countries and industries: 1980–97
(In millions of 1997 U.S. dollars)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Imports																		
United States	11,172.12	14,788.94	15,860.41	22,392.37	32,638.97	32,307.01	32,308.66	33,173.02	35,940.28	41,739.56	39,179.12	41,291.15	50,040.00	54,780.53	64,463.66	74,610.70	74,697.73	81,869.82
Canada	1,769.67	2,098.47	2,004.32	2,508.73	3,321.63	2,947.83	3,441.28	3,754.39	4,535.29	5,179.71	6,156.28	7,181.36	7,329.76	7,386.52	9,210.86	10,782.17	11,578.84	12,815.63
Japan	1,163.12	1,295.43	1,289.35	1,723.60	2,222.31	2,058.06	2,598.82	3,498.98	4,936.18	6,682.03	7,937.42	8,241.10	8,655.04	11,240.64	15,146.51	22,126.54	23,373.09	21,452.17
Germany[a]	5,864.32	6,035.69	5,991.08	6,713.73	7,384.22	7,753.16	8,928.00	10,458.66	11,876.54	13,314.74	17,142.22	18,969.59	18,156.41	19,070.38	23,049.09	26,135.35	27,845.96	29,200.64
France	2,917.48	3,242.74	3,344.76	2,990.43	3,523.33	3,669.41	4,452.27	5,279.46	6,971.50	7,227.03	8,503.33	8,980.51	8,359.12	9,084.00	10,487.39	12,119.54	12,699.48	13,317.06
United Kingdom	3,746.36	5,159.06	5,916.30	6,506.01	6,785.62	7,243.12	7,622.19	9,227.94	11,624.62	13,570.93	13,300.91	13,142.44	13,729.32	15,515.43	17,690.72	21,307.27	22,513.23	25,268.86
Italy	2,393.42	2,322.34	2,490.49	2,324.37	2,860.10	3,299.99	3,803.94	4,845.87	6,194.59	6,990.83	7,978.76	8,474.21	7,955.38	6,855.01	8,301.87	8,533.53	8,896.30	9,677.82
China	436.58	671.72	478.38	677.49	1,908.78	3,932.65	2,258.78	2,712.22	4,282.66	4,101.19	3,872.48	4,763.39	6,234.61	9,854.30	12,241.74	13,249.44	14,569.22	16,046.54
South Korea	1,386.89	1,503.42	1,721.97	2,605.05	3,151.51	2,881.40	3,544.64	4,751.61	6,119.48	6,542.35	7,228.55	8,185.55	8,649.63	8,977.85	11,028.95	14,313.26	16,315.66	17,457.48
Taiwan	1,461.00	1,656.59	1,518.74	1,973.54	2,648.61	2,263.22	3,391.12	4,922.43	6,371.96	7,346.36	7,904.77	8,925.66	10,850.82	11,593.05	13,022.99	16,887.04	18,770.48	21,446.24
Singapore	2,981.58	3,326.53	3,680.76	4,716.41	5,390.36	5,066.24	5,952.22	7,750.67	10,500.76	12,348.09	15,079.36	17,443.62	19,492.54	24,008.27	32,782.11	41,655.49	46,226.23	51,451.91
Hong Kong	2,891.67	3,425.88	3,190.38	4,137.03	6,056.45	5,364.34	5,631.00	8,259.86	13,547.51	13,502.72	17,370.42	21,155.28	26,161.72	26,174.65	31,759.67	39,394.01	42,485.09	47,546.83
All countries[b]	62,537.01	72,566.65	72,920.83	86,644.67	108,195.12	110,013.67	119,278.51	136,733.33	169,684.40	191,682.55	208,910.97	232,182.01	256,927.86	285,149.83	350,501.10	420,260.51	448,713.79	484,002.99
Apparent consumption																		
United States	103,381.08	111,798.88	121,860.78	133,040.67	164,344.36	163,226.37	163,226.37	130,804.70	140,866.59	148,692.52	148,692.52	154,282.46	176,642.24	179,996.20	205,709.95	242,603.58	264,963.36	294,617.44
Canada	4,415.66	4,604.26	4,465.38	4,887.97	5,880.17	5,738.00	6,649.80	7,760.53	9,035.46	9,852.18	10,527.23	12,500.99	13,089.73	12,655.00	14,665.68	16,022.99	16,025.03	16,370.46
Japan	81,107.30	94,445.36	102,164.92	112,280.98	136,643.83	137,703.09	134,525.32	138,762.34	163,125.19	179,014.01	194,902.83	212,910.16	188,547.30	172,658.48	192,784.32	217,147.17	237,273.01	236,612.45
Germany[a]	33,696.70	35,595.87	36,961.28	41,380.22	43,207.04	42,157.79	45,500.93	45,998.21	49,226.98	54,983.17	64,015.19	69,687.45	68,216.94	77,698.33	86,183.27	94,386.98	98,697.30	102,835.57
France	13,241.27	14,542.87	15,164.64	14,310.79	16,802.56	17,058.11	18,381.25	20,275.25	23,827.66	25,481.12	28,442.35	29,056.07	27,367.89	25,730.36	27,260.94	28,751.81	29,286.52	29,531.17
United Kingdom	18,361.50	19,423.75	20,942.37	23,129.63	26,705.12	26,770.62	26,861.37	29,394.85	32,172.17	33,744.70	32,858.19	29,476.30	29,578.55	27,220.92	30,898.62	33,702.59	35,094.26	39,285.90
Italy	7,693.15	7,430.51	7,695.38	8,047.00	7,964.78	8,159.29	9,294.66	11,159.08	12,501.63	14,261.41	15,335.74	15,768.60	14,657.86	12,311.96	13,725.52	14,238.21	14,520.71	14,918.06
China	6,816.13	6,292.85	5,768.55	7,179.69	10,591.05	20,351.69	17,719.77	20,749.41	29,549.21	33,095.65	24,440.49	26,995.75	32,894.69	47,290.97	54,381.59	63,978.25	77,296.49	92,975.00
South Korea	3,888.72	4,687.76	4,890.88	6,891.41	9,095.53	8,797.51	12,054.02	16,187.42	18,497.31	18,390.74	21,700.87	21,243.82	22,209.48	25,041.13	27,751.38	32,136.33	39,593.77	42,370.44
Taiwan	4,909.69	5,348.73	5,545.70	7,354.92	9,835.84	10,412.12	15,309.26	18,065.24	20,723.64	21,931.22	23,370.77	25,545.37	26,677.54	31,855.92	29,787.61	34,319.77	38,370.96	43,851.76
Singapore	4,198.03	4,992.24	4,979.21	6,791.64	8,627.56	8,205.63	9,751.69	13,528.42	16,279.80	10,393.97	12,231.36	12,765.32	13,302.68	14,316.24	14,539.55	19,215.52	23,345.60	29,181.42
Hong Kong	4,548.01	5,984.09	5,561.09	6,732.74	7,566.56	5,501.02	6,996.77	9,626.54	11,795.24	8,862.86	9,266.51	10,515.78	14,003.97	10,479.35	11,592.82	14,675.36	16,614.18	20,283.13
All countries[b]	343,989.42	374,439.13	393,548.85	432,100.84	512,915.13	525,926.50	549,749.35	553,577.00	628,946.76	677,087.05	704,426.21	745,650.65	755,285.15	771,309.04	863,618.57	990,044.40	1,086,585.99	1,176,858.10

Drugs and medicines

Production																		
United States	39,839.94	43,434.68	44,615.56	44,684.52	45,433.82	46,512.90	49,086.38	53,985.55	57,465.07	60,742.25	63,948.57	69,418.21	73,903.89	75,012.30	79,969.64	83,181.34	90,835.53	94,138.32
Canada	1,882.98	2,270.29	2,245.22	2,190.88	2,388.86	2,844.89	2,931.66	3,417.32	3,497.10	3,359.03	3,619.08	3,645.77	3,823.53	4,084.41	4,205.55	4,536.04	4,793.02	5,010.35
Japan	26,902.55	29,438.92	31,938.00	34,041.58	34,616.92	35,725.38	36,320.79	39,734.75	41,400.31	43,307.76	43,746.12	43,900.46	43,954.58	44,630.69	46,563.91	50,121.33	49,672.65	49,924.15
Germany[a]	12,707.96	15,414.90	16,455.23	17,557.63	19,463.89	19,194.38	17,786.46	16,284.55	16,582.26	18,024.65	17,570.28	18,053.48	17,354.69	17,708.17	19,476.95	19,693.89	20,782.99	22,452.50
France	5,815.52	7,189.56	7,225.49	7,016.47	7,138.98	7,336.02	7,494.18	7,551.71	8,149.71	8,517.38	8,867.40	9,004.56	9,472.47	9,668.37	9,800.50	10,285.47	10,826.50	11,666.57
United Kingdom	10,290.89	10,491.45	11,158.21	10,522.74	11,243.02	11,501.12	12,112.02	12,988.67	13,765.76	14,050.20	14,105.22	14,492.14	15,687.54	15,771.42	16,828.05	18,022.14	19,178.84	19,202.76
Italy	5,680.14	4,957.00	4,030.97	3,848.85	3,975.53	3,704.35	3,715.25	3,907.95	2,676.71	2,484.83	3,119.73	2,879.01	2,913.75	2,206.03	2,218.96	2,415.37	2,583.60	2,776.94
China	788.85	1,091.54	1,362.15	1,996.77	1,987.80	1,671.67	2,301.80	3,204.00	5,062.85	4,671.02	4,052.83	4,466.75	4,371.66	4,238.57	4,822.68	5,421.55	6,098.59	6,721.19
South Korea	1,805.63	1,896.13	2,148.81	2,180.70	2,473.90	2,536.56	2,753.18	2,868.93	3,852.64	3,205.66	3,901.39	3,668.68	3,875.88	4,065.44	4,374.42	4,389.20	4,434.02	4,638.11
Taiwan	308.21	344.59	437.36	441.65	501.80	563.09	696.47	557.45	625.48	531.36	545.23	558.45	599.55	625.74	625.34	657.09	692.37	743.93
Singapore	305.90	344.04	343.74	391.06	519.35	486.81	666.38	765.32	756.50	803.84	823.91	1,099.61	1,022.36	1,007.62	911.11	979.14	1,025.25	1,054.87
Hong Kong	139.15	175.90	154.78	100.31	145.78	122.79	145.24	151.00	159.35	154.67	136.52	156.57	162.11	187.25	196.49	207.71	217.94	227.14
All countries[b]	151,016.98	163,212.01	166,519.46	168,313.16	177,534.12	181,221.99	187,635.38	200,338.86	211,797.71	217,039.67	224,921.64	234,275.66	240,919.03	245,889.52	262,991.18	275,375.52	291,203.78	305,174.90

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-4.
Global industry and trade data, by selected countries and industries: 1980–97
(In millions of 1997 U.S. dollars)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Exports																		
United States	4,224.63	4,497.08	4,594.26	4,621.83	4,649.28	4,466.33	5,260.10	5,083.03	5,915.97	5,164.35	5,355.94	5,613.64	6,279.80	6,361.62	6,670.30	7,124.60	7,856.93	8,178.75
Canada	178.89	260.03	249.84	271.50	235.49	228.83	262.80	292.18	249.60	218.23	269.11	277.46	386.54	406.80	517.99	625.67	689.60	735.33
Japan	611.89	663.87	653.61	694.17	675.10	721.08	800.56	814.73	889.11	927.82	1,022.76	1,114.11	1,258.35	1,194.66	1,160.52	1,345.90	1,503.92	1,625.87
Germany[a]	4,300.15	5,014.85	5,000.24	4,900.56	5,156.84	5,408.52	5,566.13	5,590.74	6,535.27	6,480.41	6,496.75	7,269.53	7,481.43	8,527.52	9,528.65	9,908.45	10,670.99	11,363.08
France	2,437.65	2,781.16	5,289.65	2,898.98	2,885.92	3,024.61	3,135.66	3,123.33	3,403.75	3,687.35	3,747.32	4,066.10	4,581.84	5,482.54	5,507.70	6,325.48	6,740.58	7,307.03
United Kingdom	3,075.15	3,467.86	3,619.73	3,419.16	3,489.80	3,720.56	4,291.73	4,201.76	4,658.42	4,942.61	5,033.41	5,422.93	5,961.91	6,991.22	6,978.92	8,455.29	9,509.24	10,146.77
Italy	1,235.22	1,431.14	1,450.00	1,446.14	1,545.09	1,712.28	1,647.70	1,560.45	1,720.33	1,556.62	1,502.96	1,569.96	2,245.02	2,759.17	2,892.84	3,572.17	3,826.86	4,059.60
China	313.06	321.73	310.83	316.24	339.52	405.22	486.32	513.66	627.93	693.03	768.04	867.79	967.37	951.13	1,164.36	1,521.26	1,687.69	1,828.40
South Korea	38.56	54.13	55.75	55.58	62.80	75.78	115.51	117.49	117.67	137.56	145.23	174.12	205.70	209.70	242.41	275.20	307.59	331.36
Taiwan	47.55	68.50	60.70	56.30	50.74	45.93	58.31	70.50	84.18	101.13	94.19	109.06	117.49	93.12	99.46	101.87	106.15	105.01
Singapore	294.29	287.17	320.09	299.95	237.29	258.57	300.31	292.95	353.62	343.06	348.00	350.61	395.49	557.76	684.54	802.58	858.98	903.42
Hong Kong	381.20	455.53	446.94	444.24	408.13	445.80	560.88	725.62	889.55	840.18	892.07	1,124.02	1,274.40	1,141.31	1,238.86	1,447.06	1,588.36	1,726.54
All countries[b]	27,638.00	31,227.93	33,915.92	31,226.54	31,581.79	32,986.38	35,970.76	36,447.69	41,898.77	41,616.25	43,119.03	47,427.10	52,861.65	61,299.86	65,860.13	73,212.41	80,307.20	86,002.30
Imports																		
United States	1,114.15	1,449.59	1,708.37	1,838.04	2,107.53	2,246.79	2,353.29	2,398.10	2,658.63	2,770.54	2,839.87	3,259.53	3,899.99	4,671.40	5,087.73	5,861.15	7,606.53	8,117.78
Canada	548.48	602.02	665.52	691.34	693.53	607.87	697.12	708.69	830.92	802.06	911.38	1,011.13	1,234.42	1,413.30	1,500.23	1,617.50	1,777.08	1,872.58
Japan	1,793.89	2,102.16	2,288.67	2,090.93	2,136.23	2,150.02	2,591.41	2,798.83	3,361.66	3,153.40	2,925.33	3,014.52	3,300.04	3,758.14	3,966.20	4,122.36	4,146.54	4,089.33
Germany[a]	2,409.64	2,437.64	3,078.52	2,508.55	2,615.17	2,855.80	3,285.97	3,353.76	3,726.35	3,536.37	3,845.08	4,704.24	4,890.60	5,089.45	5,929.72	6,422.09	6,999.19	7,539.37
France	1,302.36	1,525.12	1,499.91	1,495.36	1,476.46	1,533.41	1,684.16	1,777.12	2,241.81	2,565.58	2,876.47	3,154.66	3,630.85	4,182.58	4,570.46	5,207.09	5,505.85	5,842.70
United Kingdom	1,189.80	1,506.76	1,936.34	1,799.98	1,903.12	1,989.55	2,140.29	2,227.40	2,733.58	2,743.36	2,750.71	3,122.68	3,616.66	4,431.72	4,649.06	5,243.28	5,949.34	6,499.26
Italy	1,134.67	1,341.44	1,652.09	1,497.05	1,600.17	1,779.42	2,103.32	2,173.31	2,748.97	2,775.33	3,055.82	3,170.75	3,663.06	3,825.42	3,486.16	3,774.63	4,104.89	4,502.65
China	25.34	44.90	69.26	71.16	106.25	143.00	207.13	337.14	498.30	364.67	471.16	625.73	628.99	665.49	723.99	848.13	960.48	1,083.25
South Korea	137.32	156.30	201.04	222.93	253.41	234.17	239.83	256.90	336.44	336.28	372.60	454.74	479.64	569.78	637.35	759.13	840.33	851.22
Taiwan	201.35	241.86	273.32	265.53	297.98	300.15	330.74	352.56	364.30	349.85	362.09	396.30	486.25	551.22	607.28	670.73	744.66	821.67
Singapore	260.82	275.89	294.08	265.72	269.33	276.90	298.27	316.25	340.53	362.66	338.37	337.41	382.79	575.86	636.22	829.79	901.64	947.36
Hong Kong	565.73	647.30	631.20	594.56	605.04	665.79	760.68	931.78	1,038.73	986.98	1,103.07	1,381.23	1,481.43	1,422.39	1,608.48	1,860.70	2,007.73	2,127.08
All countries[b]	24,284.24	27,358.80	30,524.62	27,816.72	28,604.09	29,732.65	32,935.15	33,948.68	39,055.54	39,164.91	41,224.16	45,531.78	50,527.47	58,931.67	63,666.95	70,460.62	77,570.01	82,647.83
Apparent consumption																		
United States	31,166.19	34,290.12	37,006.45	40,327.25	41,816.49	44,122.87	48,306.64	53,012.47	55,615.39	58,576.61	61,003.96	65,981.34	70,797.85	71,931.41	77,460.54	82,063.98	90,405.03	96,294.77
Canada	1,968.34	2,280.64	2,399.21	2,526.56	2,772.53	3,179.42	3,457.12	3,907.12	4,108.65	3,907.42	4,176.15	4,236.24	4,533.63	4,898.64	5,118.35	5,518.78	5,918.43	6,115.45
Japan	26,962.21	29,647.42	32,219.13	33,994.70	34,600.75	35,636.75	38,025.73	41,477.48	43,272.27	44,506.07	44,256.99	44,227.75	44,476.43	44,999.09	47,054.30	50,042.06	52,858.08	55,286.84
Germany[a]	12,791.60	15,139.04	16,828.20	17,412.18	19,282.73	19,114.41	18,051.11	16,604.54	16,760.57	18,041.14	17,882.32	18,789.99	18,162.82	18,151.35	20,211.45	21,277.81	22,702.57	23,874.87
France	4,365.82	5,480.85	4,911.91	6,162.31	6,334.68	6,741.19	7,040.59	7,078.92	8,002.64	9,488.86	10,412.09	11,143.44	12,388.86	13,339.42	14,224.92	15,440.44	16,173.63	17,299.56
United Kingdom	7,420.80	7,622.14	8,779.77	9,082.45	10,008.78	10,475.67	11,169.09	12,198.79	12,979.58	12,928.17	13,008.87	13,319.34	14,637.73	14,793.70	16,047.51	17,284.98	18,629.95	19,516.10
Italy	6,038.71	5,399.30	4,772.22	4,437.36	4,604.33	4,406.57	4,781.13	5,097.87	4,340.20	4,277.12	5,225.81	5,057.35	5,157.46	4,287.60	3,876.25	4,020.82	4,364.29	4,678.17
China	528.52	844.16	1,150.75	1,784.26	1,791.69	1,456.25	2,081.33	3,092.54	5,016.44	4,437.47	3,864.16	4,350.93	4,178.96	4,100.64	4,568.09	4,996.81	5,652.88	8,562.94
South Korea	1,588.41	1,669.31	1,969.10	2,185.38	2,530.00	2,629.85	2,903.88	3,032.37	4,051.38	3,357.42	4,021.45	3,793.27	3,979.64	4,190.57	4,393.92	4,788.17	5,038.31	5,164.97
Taiwan	471.37	531.48	662.02	662.06	759.10	826.43	980.42	853.36	922.11	799.86	831.55	866.96	991.17	1,101.91	1,152.41	1,245.48	1,347.37	1,438.72
Singapore	265.93	316.99	319.67	374.41	551.82	523.64	714.66	839.82	801.52	871.73	831.32	1,105.12	1,016.64	1,062.01	1,039.41	1,205.29	1,277.96	1,327.44
Hong Kong	401.51	458.43	435.63	363.97	444.40	459.10	496.77	549.79	542.99	519.92	576.46	699.34	692.06	712.14	813.75	918.37	967.11	1,004.56
All countries[b]	142,925.72	154,534.86	162,252.57	168,100.52	178,334.11	183,907.82	196,464.71	209,225.69	221,612.00	225,878.44	233,888.55	243,118.45	252,048.26	258,109.55	276,353.88	293,376.84	314,396.12	334,896.56

[a]German data are for the former West Germany only.

[b]A total of 68 countries are included.

[c]High-technology industries cover aerospace, office and computing machinery, communication equipment, and drugs and medicines.

NOTE: Historical data were from UNIDO, UN SNA, Statistics Canada, OECD, and country sources.

SOURCE: WEFA Global Industry Service.

See figures 7-2 and 7-4 through 7-11 in Volume I.

Appendix table 7-5.
Global industry and trade data for selected countries and service industries
(in millions of 1997 U.S. dollars)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Total for 5 knowledge-based service industries[c]																		
Production																		
United States	963,492.5	1,018,413.3	1,047,628.2	1,117,227.7	1,237,230.1	1,289,386.9	1,361,915.2	1,512,172.7	1,565,215.3	1,626,707.5	1,650,925.1	1,634,975.0	1,683,749.7	1,752,554.3	1,816,294.9	1,861,669.6	1,948,620.4	2,062,145.4
Canada	67,160.9	72,335.7	73,802.6	75,503.6	79,860.8	84,900.5	91,048.9	97,140.1	103,471.3	109,177.7	112,978.6	115,619.0	117,504.5	120,572.7	126,989.5	129,566.7	136,505.3	144,591.4
Japan	651,733.2	682,795.0	715,392.2	762,563.2	814,887.6	866,256.3	918,244.6	980,336.8	1,043,670.3	1,127,628.3	1,190,940.6	1,221,658.3	1,243,710.3	1,237,778.4	1,258,118.0	1,296,937.3	1,338,804.7	1,353,567.8
Germany[a]	244,408.1	254,723.7	261,741.1	272,775.6	287,923.8	304,044.4	320,564.6	331,431.4	352,970.7	367,756.6	396,978.5	461,969.5	495,572.2	506,034.0	531,006.4	542,758.4	552,887.1	535,159.2
France	204,209.8	210,043.7	216,626.8	217,509.1	226,818.0	241,664.7	269,916.1	296,980.4	318,446.1	349,620.6	374,855.4	392,388.7	413,821.5	470,539.1	490,031.8	499,213.3	517,488.0	533,405.5
United Kingdom	157,796.7	157,442.7	161,902.6	175,241.8	181,056.5	196,933.8	222,466.9	236,008.2	257,644.2	276,632.7	294,773.0	293,411.6	304,223.7	330,023.7	348,632.2	355,983.4	371,318.4	382,681.1
Italy	163,274.2	170,123.6	174,814.9	179,478.2	189,509.1	201,661.2	212,258.7	220,233.3	228,594.5	239,263.4	249,398.1	254,948.1	263,113.9	274,154.9	285,340.8	294,200.6	301,722.3	308,364.2
China	9,166.3	9,591.3	10,437.4	11,584.7	14,644.8	19,223.6	21,202.0	23,985.6	27,950.3	31,756.8	31,895.1	35,958.8	40,643.3	44,866.6	49,636.3	55,970.0	62,545.9	68,125.5
South Korea	15,441.4	15,986.5	16,855.0	19,480.0	22,812.8	26,748.5	30,498.6	35,784.1	41,918.2	47,992.8	56,728.8	64,452.7	72,926.3	78,498.0	86,380.0	95,109.2	103,848.9	110,898.9
Taiwan	15,864.2	16,401.3	17,169.7	19,655.7	21,639.9	22,870.0	27,396.5	33,354.9	37,751.6	44,745.5	47,660.5	51,191.9	57,348.4	63,365.4	72,074.7	77,602.6	83,825.0	91,662.3
Singapore	6,515.3	7,361.5	8,071.4	8,852.7	9,781.0	10,614.7	10,499.5	11,480.4	12,163.6	13,378.5	14,878.2	16,048.3	17,015.3	19,079.7	20,854.9	23,084.7	24,859.4	25,969.6
Hong Kong	13,267.0	16,445.6	17,899.2	19,276.3	19,823.4	20,416.2	23,113.9	26,329.6	28,368.3	28,843.0	31,298.2	36,018.3	38,925.9	41,463.9	44,137.5	47,277.7	51,389.6	55,353.8
All countries[b]	3,413,435.0	3,555,462.5	3,669,901.6	3,853,666.6	4,112,393.6	4,322,737.1	4,595,859.2	4,975,234.0	5,237,142.6	5,576,571.0	5,788,533.1	5,974,049.9	6,155,047.5	6,389,585.7	6,632,455.2	6,850,236.5	7,135,027.0	7,414,059.2
Communication services																		
Production																		
United States	143,547.0	152,380.7	154,589.1	161,214.3	176,673.3	179,985.9	187,715.3	195,444.8	205,382.7	204,278.5	204,278.5	206,486.9	210,903.7	215,320.5	219,737.4	233,096.1	258,739.9	285,310.0
Canada	8,384.5	9,212.6	9,286.8	9,565.4	10,116.4	10,745.9	11,398.2	12,206.8	13,294.0	14,638.8	15,693.6	15,939.4	16,308.1	16,829.5	17,631.9	18,067.9	18,834.1	19,683.2
Japan	68,954.3	74,010.4	77,038.7	82,428.2	88,709.5	94,014.3	95,914.5	100,460.8	107,811.1	114,091.3	119,324.9	123,511.7	124,558.4	127,698.6	129,792.0	130,838.7	133,978.8	138,074.5
Germany[a]	27,801.4	29,380.4	30,084.9	30,516.9	32,509.8	33,963.4	36,096.7	38,114.2	40,752.2	43,378.4	46,378.6	50,290.8	55,180.4	56,146.0	58,855.4	60,235.2	61,789.8	60,655.3
France	18,650.1	20,472.2	21,898.3	23,395.0	24,498.9	25,940.3	27,445.9	28,718.0	31,660.0	34,899.8	37,823.5	41,341.6	43,844.1	45,235.4	46,962.1	48,074.7	50,061.4	51,768.7
United Kingdom	14,761.0	16,594.5	18,057.7	19,326.0	21,655.1	22,930.2	25,610.1	27,499.4	30,125.9	31,195.2	32,334.2	32,514.2	33,132.0	34,261.1	36,077.6	37,190.2	38,650.5	39,943.8
Italy	9,588.3	10,144.1	10,566.0	11,286.9	12,539.4	14,406.7	15,030.2	16,344.0	17,009.7	18,084.7	19,214.0	20,892.1	23,660.7	26,678.9	27,749.4	28,704.3	29,831.0	30,627.1
China	948.1	989.0	1,065.9	1,168.6	1,368.1	1,550.6	1,722.5	1,865.1	2,008.4	2,187.9	2,924.8	3,156.7	3,560.5	3,865.0	4,178.2	4,709.0	5,185.7	5,592.1
South Korea	2,225.1	2,564.5	2,402.5	2,921.2	3,613.4	4,046.4	4,788.4	5,807.3	6,877.2	7,907.7	9,443.0	11,463.5	13,031.3	13,967.5	15,213.9	16,731.8	18,143.1	19,408.2
Taiwan	1,206.3	1,338.1	1,451.8	1,642.5	1,934.0	2,138.6	2,355.5	2,694.9	3,022.9	3,312.8	3,521.3	3,878.1	4,286.1	4,715.3	5,230.8	5,655.1	6,142.1	6,688.1
Singapore	837.8	954.9	1,074.3	1,159.9	1,277.2	1,316.0	1,432.8	1,555.8	1,718.2	1,882.7	2,051.5	2,214.9	2,415.1	2,643.2	2,873.7	3,173.0	3,423.2	3,606.9
Hong Kong	1,442.8	1,602.6	1,800.1	1,977.6	2,080.1	2,009.9	2,351.6	2,655.4	2,994.2	3,225.0	3,607.7	4,086.1	4,483.5	4,767.3	5,060.2	5,332.1	5,755.4	6,224.5
All countries[b]	367,633.3	391,901.4	403,401.1	423,812.9	458,070.4	478,014.3	500,369.5	526,574.5	560,546.7	582,408.1	604,260.3	627,677.0	650,896.9	671,541.1	692,141.4	719,747.0	764,540.7	810,071.3
Financial institutions																		
Production																		
United States	228,928.0	236,876.8	248,005.3	273,441.7	338,622.6	354,520.4	378,367.0	456,266.1	451,496.8	462,625.2	461,035.5	451,496.8	472,163.9	511,908.3	521,447.0	511,385.9	529,970.4	548,191.2
Canada	10,939.5	11,556.3	11,874.0	11,098.5	11,434.3	12,134.9	13,072.1	13,507.5	14,164.8	14,669.7	15,212.9	15,422.7	15,751.9	16,252.8	16,988.5	17,289.8	18,247.7	19,547.5
Japan	96,118.6	98,110.8	99,673.5	104,804.0	111,473.2	117,951.9	125,299.0	135,787.8	143,070.9	155,803.2	158,858.1	157,330.7	160,385.6	157,330.7	158,858.1	163,440.6	172,605.5	169,438.7
Germany[a]	71,823.2	71,487.2	74,281.9	76,421.6	79,140.3	84,808.4	90,256.8	91,747.0	95,466.8	99,205.2	107,916.9	126,197.8	134,965.9	135,766.8	141,292.8	143,624.2	144,827.3	138,559.0
France	55,565.1	56,059.9	57,443.3	56,142.9	57,935.9	61,770.2	72,951.4	81,513.4	79,867.3	79,881.1	85,193.8	88,269.6	93,660.7	110,747.4	114,735.5	115,818.3	118,740.7	121,315.3
United Kingdom	47,407.8	46,037.3	47,718.1	52,134.7	52,816.4	56,505.1	62,831.7	66,704.9	71,166.9	77,047.9	80,133.0	76,695.9	78,216.5	81,247.5	85,160.4	86,419.2	90,394.1	92,919.3
Italy	41,011.9	40,927.1	40,879.1	41,018.9	42,476.3	44,333.8	46,144.6	47,214.4	48,559.8	50,337.1	51,965.2	52,435.5	53,254.5	54,645.5	56,459.5	57,788.2	58,492.7	59,524.6
China	2,341.9	2,444.0	2,659.0	2,955.0	3,771.7	5,024.6	5,532.6	6,284.2	7,374.8	8,388.4	8,197.3	9,274.4	10,506.3	11,644.2	12,930.1	15,331.2	18,011.6	20,330.9
South Korea	5,465.8	5,002.8	5,100.0	5,670.5	6,886.1	8,649.0	10,056.6	12,601.4	15,559.7	18,231.9	22,016.4	25,154.2	29,898.9	32,012.4	35,093.7	38,729.4	42,572.5	45,361.7
Taiwan	5,274.1	6,022.8	6,163.1	6,368.3	7,133.6	7,717.4	8,139.9	9,597.1	11,487.6	14,470.8	15,757.3	16,553.4	18,492.7	20,313.3	23,348.5	25,107.5	27,084.7	29,715.4
Singapore	2,420.6	2,775.5	3,034.6	3,349.7	3,736.3	4,168.7	4,035.4	4,427.9	4,626.5	5,065.1	5,635.5	6,029.3	6,342.2	7,145.9	7,787.3	8,644.9	9,346.0	9,766.9
Hong Kong	6,276.2	7,804.8	8,236.3	8,391.9	8,449.8	8,173.1	9,784.3	11,723.0	11,942.8	12,413.7	13,725.9	17,764.1	19,488.0	20,733.9	21,995.9	23,847.1	26,124.2	27,984.5
All countries[b]	827,771.3	847,490.1	873,443.8	916,910.6	1,010,574.6	1,062,331.5	1,138,187.8	1,287,144.3	1,320,954.2	1,405,766.4	1,438,448.8	1,466,228.4	1,520,544.2	1,604,040.5	1,656,301.0	1,690,738.7	1,765,138.8	1,824,571.2

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-5.
Global industry and trade data for selected countries and industries
(In millions of 1997 U.S. dollars)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Business services																		
Production																		
United States	422,856.6	447,224.6	455,825.1	490,227.0	530,362.5	561,897.6	596,299.5	647,902.3	688,037.9	743,940.9	761,141.9	745,374.3	756,841.6	781,209.6	822,778.6	863,422.9	902,407.9	961,343.1
Canada	35,420.8	38,794.1	39,898.4	41,431.1	44,152.3	47,413.3	51,399.2	55,685.2	59,596.1	62,716.5	64,422.8	65,793.3	66,779.1	68,680.3	72,626.0	74,144.5	78,437.5	83,399.4
Japan	182,643.5	194,910.6	203,088.7	218,081.8	235,801.0	253,520.1	272,602.3	299,862.5	320,307.7	351,656.9	362,561.0	363,924.0	372,102.1	366,650.1	373,465.1	387,095.2	403,451.4	409,995.9
Germany[a]	97,672.6	107,438.0	114,362.2	122,647.2	131,127.6	139,223.9	149,311.4	157,925.5	169,411.0	180,896.5	196,689.1	232,581.2	249,809.5	256,987.9	271,344.8	278,523.2	285,701.7	278,088.4
France	93,892.0	94,884.5	96,128.1	94,550.9	97,890.4	103,850.6	115,668.6	130,813.8	146,908.8	170,033.4	182,275.8	189,077.1	199,959.3	236,686.5	247,568.6	253,009.7	263,891.8	273,518.3
United Kingdom	49,625.9	52,022.6	56,817.5	64,760.7	67,794.4	74,770.6	85,706.5	93,359.0	102,128.6	112,778.3	119,253.8	115,660.0	119,395.6	125,968.4	134,248.1	137,234.1	143,246.7	147,766.5
Italy	47,956.3	51,706.7	54,269.8	56,486.0	60,358.0	64,784.9	69,157.1	72,355.3	76,008.4	80,263.9	84,309.7	86,342.4	88,890.2	92,240.0	96,677.9	100,143.4	103,722.2	106,661.4
China	735.7	773.3	851.0	958.5	1,247.6	1,692.7	1,886.6	2,173.7	2,585.8	2,956.5	2,909.1	3,332.4	3,846.5	4,338.4	4,902.8	5,654.0	6,460.1	7,304.3
South Korea	3,525.5	3,958.8	4,424.9	5,106.0	5,667.6	6,418.8	7,115.4	8,125.2	9,322.9	10,446.2	12,680.0	13,738.1	14,663.2	16,031.8	18,014.9	20,104.8	22,226.4	24,116.0
Taiwan	3,912.6	4,677.3	4,956.2	5,301.0	6,143.7	6,835.3	7,432.0	9,049.2	11,143.0	14,437.9	16,132.3	17,372.5	19,882.4	22,349.9	26,280.1	28,575.9	31,230.8	34,478.5
Singapore	2,169.3	2,534.7	2,816.4	3,156.9	3,566.3	3,988.0	3,873.1	4,298.8	4,553.5	5,064.2	5,711.7	6,183.0	6,577.9	7,513.6	8,299.3	9,251.9	9,992.2	10,488.1
Hong Kong	1,915.6	2,564.4	2,736.9	3,162.9	3,273.8	3,791.0	4,526.0	5,565.9	6,703.8	6,560.2	7,200.7	7,612.7	8,115.2	8,768.0	9,458.1	10,141.1	11,105.7	12,229.7
All countries[b]	1,154,328.2	1,220,398.8	1,261,393.1	1,337,619.1	1,429,734.7	1,517,526.9	1,628,000.6	1,777,244.6	1,900,949.9	2,075,189.0	2,156,663.1	2,197,300.5	2,259,402.1	2,348,382.9	2,461,495.4	2,562,432.3	2,675,134.6	2,791,438.3
Educational services																		
Production																		
United States	23,356.6	24,351.6	25,325.9	25,310.3	24,537.4	24,372.9	24,620.0	25,039.7	26,475.1	26,767.4	27,494.8	28,339.3	29,532.2	29,807.5	31,720.4	32,017.6	32,777.0	34,382.1
Canada	1,130.9	1,168.2	1,274.9	1,304.4	1,412.7	1,452.5	1,476.8	1,519.8	1,598.3	1,663.1	1,703.0	1,749.5	1,797.1	1,792.4	1,850.8	1,878.2	1,969.0	2,065.4
Japan	54,724.9	54,529.3	56,444.2	58,696.1	60,944.9	63,404.9	66,165.2	68,048.7	70,926.7	74,667.6	79,975.3	82,786.5	83,602.1	83,037.1	83,984.2	85,631.0	88,387.9	88,574.9
Germany[a]	18,292.3	17,187.5	16,012.6	15,748.7	15,887.4	15,900.6	15,683.7	15,487.1	16,207.2	15,691.3	16,167.3	17,941.1	18,605.1	18,806.5	19,307.5	19,308.6	19,291.2	18,517.2
France	4,315.4	4,916.7	5,649.6	5,832.0	6,050.4	6,569.3	6,650.4	6,759.1	7,343.2	7,466.1	7,476.8	7,722.1	7,993.1	8,137.8	8,324.5	8,474.3	8,699.2	9,039.3
United Kingdom	12,668.7	11,141.7	9,822.1	9,406.2	9,086.7	9,735.3	10,703.1	10,459.5	11,413.9	11,484.9	12,828.5	13,807.6	14,644.8	17,373.9	17,944.2	18,211.2	18,715.8	18,904.1
Italy	16,261.0	15,894.0	15,647.5	15,496.4	15,775.0	16,185.1	16,548.4	16,641.0	16,777.1	17,114.8	17,422.1	17,404.7	17,529.5	17,932.0	18,330.2	19,029.5	19,159.0	19,463.7
China	2,711.9	2,834.6	3,071.4	3,388.0	4,265.8	5,615.2	6,148.1	6,917.4	8,036.7	9,142.4	8,936.6	10,044.6	11,201.5	12,221.4	13,377.6	14,441.0	15,409.2	16,172.9
South Korea	1,707.6	1,766.3	1,915.5	2,197.7	2,477.6	2,795.3	3,059.5	3,242.5	3,483.5	3,844.0	4,154.6	4,557.4	4,879.6	5,162.2	5,540.3	5,840.8	6,096.9	6,317.2
Taiwan	1,989.1	1,524.3	1,557.0	2,080.6	2,040.6	1,909.3	2,836.0	3,480.1	3,403.1	3,420.4	3,257.0	3,462.6	3,698.3	3,921.1	4,113.1	4,262.3	4,373.9	4,543.2
Singapore	332.5	312.3	308.5	303.2	293.0	270.3	265.6	263.5	266.5	275.9	286.9	303.0	303.0	307.6	315.2	328.5	330.5	322.5
Hong Kong	1,119.3	1,290.5	1,411.2	1,517.8	1,522.5	1,579.2	1,522.4	1,443.5	1,466.6	1,409.4	1,387.2	1,311.8	1,326.9	1,354.7	1,395.9	1,441.0	1,471.6	1,509.0
All countries[b]	264,974.9	263,976.2	267,999.3	273,291.7	279,255.0	288,355.0	299,274.2	306,550.6	318,715.0	329,727.6	339,066.7	349,119.3	354,132.1	363,301.1	374,297.4	384,579.0	396,289.9	407,622.5
Health services																		
Production																		
United States	144,804.4	157,579.6	163,882.8	167,034.4	167,034.4	168,610.2	174,913.4	187,519.7	193,822.9	189,095.5	196,974.5	203,277.7	214,308.3	214,308.3	220,611.4	221,747.2	224,725.2	232,919.0
Canada	11,285.2	11,604.5	11,468.4	12,104.2	12,745.1	13,153.9	13,702.7	14,220.7	14,818.0	15,489.6	15,946.3	16,714.1	16,868.3	17,017.7	17,892.4	18,186.2	19,017.1	19,895.9
Japan	249,291.9	261,234.0	279,147.2	298,553.1	317,959.1	337,365.0	358,263.7	376,176.9	401,554.0	431,409.3	470,221.2	494,105.4	503,062.0	503,062.0	512,018.6	529,931.8	540,381.2	547,483.8
Germany[a]	28,818.7	29,230.6	26,999.6	27,441.3	29,258.8	30,148.2	29,216.0	28,157.5	31,133.5	28,585.2	29,826.6	34,958.5	37,011.4	38,326.8	40,205.9	41,067.2	41,277.1	39,339.3
France	31,787.2	33,710.4	35,507.5	37,588.3	40,442.5	43,534.3	47,199.9	49,176.0	52,666.6	57,340.3	62,085.5	65,978.2	68,364.4	69,732.0	72,441.1	73,836.3	76,094.9	77,763.9
United Kingdom	33,333.3	31,646.6	29,487.3	29,614.2	29,703.8	32,992.6	37,615.5	37,985.4	42,808.9	44,126.5	50,223.5	54,733.9	58,834.8	71,172.7	75,201.8	76,928.8	80,311.2	83,147.5
Italy	48,456.8	51,451.7	53,452.4	55,190.0	58,360.3	61,950.6	65,378.4	67,678.7	70,239.5	73,462.9	76,487.1	77,873.4	79,779.0	82,658.5	86,123.8	88,535.2	90,517.3	92,087.5
China	2,428.8	2,550.3	2,790.1	3,114.7	3,991.5	5,340.5	5,912.1	6,745.1	7,944.6	9,081.6	8,927.3	10,150.7	11,528.4	12,797.6	14,247.7	15,834.8	17,479.3	18,725.3
South Korea	2,517.3	2,694.1	3,012.0	3,584.6	4,168.1	4,839.1	5,478.6	6,007.7	6,674.9	7,563.0	8,434.9	9,539.4	10,453.3	11,324.1	12,517.3	13,702.3	14,809.9	15,695.9
Taiwan	3,482.1	2,838.8	3,041.5	4,263.3	4,387.9	4,269.4	6,633.1	8,533.7	8,695.0	9,103.6	8,992.7	9,925.3	10,989.0	12,065.9	13,102.1	14,001.8	14,993.5	16,237.0
Singapore	755.2	784.2	837.7	883.0	908.2	871.8	892.7	934.3	999.0	1,090.8	1,192.7	1,318.1	1,377.1	1,469.5	1,579.3	1,686.4	1,767.5	1,785.2
Hong Kong	2,512.9	3,183.3	3,714.8	4,226.0	4,497.2	4,863.0	4,929.5	4,941.8	5,260.8	5,234.7	5,376.8	5,243.6	5,512.4	5,840.0	6,227.4	6,516.3	6,932.8	7,406.2
All countries[b]	798,727.2	831,696.0	863,664.2	902,032.4	934,759.0	976,509.4	1,030,027.2	1,077,720.0	1,135,976.7	1,183,480.0	1,250,094.2	1,333,724.7	1,370,072.2	1,402,320.2	1,448,220.1	1,492,739.4	1,533,923.0	1,580,355.8

[a]German data are for the former West Germany only.

[b]A total of 68 countries are included.

[c]High-technology services include communication services, financial institutions, business services, educational services, and health services.

SOURCE: WEFA Global Industry Service. Historical data were from UNIDO, UN SNA, Statistics Canada, OECD, and country sources.

See figure 7-3 in Volume 1.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Balance								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
All technologies									
Total, all countries	35,346.4	38,389.4	35,219.8	27,123.6	22,626.8	13,629.5	24,547.6	32,032.1	29,879.3
NAFTA partners, total	5,617.3	5,534.7	6,639.8	7,150.0	8,081.4	7,962.2	8,206.2	8,718.5	8,157.5
Canada	4,510.9	4,093.0	4,807.6	5,291.4	5,831.5	7,299.4	7,239.3	7,280.2	6,127.8
Mexico	1,106.4	1,441.7	1,832.2	1,858.5	2,249.9	662.8	966.9	1,438.4	2,029.6
Europe Four, total	15,169.4	14,873.9	12,168.8	10,201.9	11,562.2	11,212.5	10,617.2	11,695.0	11,238.2
France	2,332.4	2,610.6	1,511.4	840.1	1,099.8	1,221.9	1,034.3	791.2	296.8
Germany, Federal Republic of	5,119.8	5,754.5	4,682.3	3,604.8	3,442.8	3,769.3	3,913.6	2,753.3	2,685.2
Italy	1,507.1	1,752.1	1,880.9	955.0	1,340.7	1,302.8	1,195.4	1,137.9	872.0
United Kingdom	6,210.2	4,756.6	4,094.3	4,802.0	5,678.8	4,918.5	4,473.8	7,012.5	7,384.2
Other Western Europe, total	7,882.9	8,234.8	6,800.9	5,596.6	7,628.8	7,762.4	8,364.3	8,395.3	7,419.2
Belgium	1,177.3	1,337.7	982.2	834.7	989.8	728.9	868.1	842.9	1,393.5
Greece	87.0	309.7	152.3	206.5	138.0	665.3	171.3	251.6	667.1
Ireland	764.3	600.8	606.2	246.1	902.1	349.8	84.4	-739.2	-1,899.7
Netherlands	3,389.0	2,862.7	2,463.6	2,705.9	3,442.7	4,219.1	4,288.9	6,212.2	5,797.6
Portugal	217.6	157.2	332.4	107.7	428.5	162.9	166.8	189.5	179.8
Spain	1,500.1	1,334.7	1,277.9	847.6	987.2	1,049.1	1,046.0	855.5	680.3
Switzerland	747.6	1,632.0	986.4	648.0	740.5	587.4	1,738.8	782.9	600.6
Nordic Countries, total	2,343.8	2,491.7	1,746.8	1,308.6	1,235.0	1,450.5	2,767.0	1,752.9	2,485.0
Denmark	450.2	582.9	487.7	233.2	270.1	422.8	508.6	374.4	559.5
Finland	381.1	303.8	163.9	225.4	241.8	268.5	1,331.5	431.8	683.6
Iceland	147.2	55.6	22.3	7.0	13.4	41.7	85.7	19.6	83.5
Norway	454.3	563.9	426.6	358.8	296.9	220.6	354.1	399.3	363.2
Sweden	911.0	985.5	646.2	484.2	412.9	497.0	487.1	527.8	795.2
Central/Eastern Europe, total	364.1	531.6	1,063.4	1,094.5	997.7	743.6	398.1	819.6	863.4
Austria	220.8	297.1	367.4	279.5	177.8	269.8	142.0	300.9	263.0
Czech Republic	0.0	0.0	0.0	93.7	88.5	94.0	78.0	231.1	187.3
Czechoslovakia	17.7	37.1	243.0	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	18.6	124.3	130.0	237.1	91.1	36.6	-75.7	-308.9	-715.4
Poland	107.0	72.9	199.2	249.1	177.6	182.8	142.8	381.3	134.3
Russia	0.0	0.0	115.3	203.1	437.3	141.2	64.6	161.5	905.1
Slovakia	0.0	0.0	0.0	8.7	14.0	13.0	22.6	34.5	59.4
Slovenia	0.0	0.0	8.5	23.3	11.4	6.2	23.9	19.1	29.8
Asia, total	-7,256.7	-5,198.1	-7,403.0	-12,190.7	-20,241.5	-29,411.7	-22,593.7	-21,228.3	-25,351.5
China	1,079.2	1,351.4	2,254.8	2,293.9	759.0	-985.6	-661.5	-1,129.7	-69.4
Hong Kong	701.0	1,156.9	1,372.0	1,436.6	1,833.1	2,559.2	2,930.9	3,026.1	2,950.3
India	267.7	199.6	194.9	676.6	446.0	458.9	758.5	539.5	824.1
Indonesia	509.8	157.6	378.4	565.7	71.1	-179.2	104.3	267.3	-438.4
Japan	-7,235.1	-7,434.1	-8,854.7	-12,808.5	-14,312.9	-15,533.2	-10,350.8	-10,461.6	-9,566.2
South Korea	-172.7	714.9	524.2	-26.4	-452.9	-2,720.0	-51.4	28.1	-1,894.9
Malaysia	468.4	260.9	-483.1	-865.6	-2,381.7	-4,150.4	-4,703.1	-3,516.3	-5,047.0
Philippines	264.7	-3.0	-132.0	100.3	-41.0	-220.9	-487.3	-1,033.5	-2,248.6
Singapore	-2,464.0	-2,175.7	-3,234.7	-3,236.3	-4,527.5	-6,066.2	-7,109.4	-6,245.6	-5,745.2
Taiwan	-833.0	82.8	244.0	113.9	-966.2	-2,323.6	-3,053.0	-2,609.4	-3,231.8
Thailand	157.4	490.7	333.1	-440.9	-668.5	-250.8	29.1	-93.0	-884.3
South America, total	1,817.8	2,594.2	2,880.7	2,677.7	3,082.2	3,879.4	4,795.7	6,269.1	6,236.8
Argentina	288.8	403.6	760.4	840.0	1,028.1	807.2	839.1	1,214.6	1,342.1
Brazil	1,169.1	1,821.8	1,615.4	1,445.8	1,583.3	2,359.8	3,027.7	3,937.0	3,528.5
Chile	292.9	306.6	433.0	306.9	344.2	507.1	728.6	780.6	1,032.6
Peru	66.9	62.2	71.9	85.0	126.7	205.3	200.4	336.9	333.5
Africa, total	489.7	716.9	583.8	684.5	470.4	565.9	566.4	715.7	1,319.7
Kenya	11.1	12.3	9.9	13.4	16.9	12.9	16.4	99.2	56.8
Nigeria	76.0	49.2	50.7	55.3	33.3	27.8	26.3	26.2	38.4
South Africa, Republic of	402.5	655.4	523.2	615.8	420.2	525.2	523.6	590.3	1,224.5
All other countries	8,918.2	8,609.7	10,738.5	10,600.5	9,810.6	9,464.6	11,426.3	14,894.2	17,510.9

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Balance								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Biotechnology									
Total, all countries	629.1	657.3	697.0	833.5	956.0	610.7	648.6	653.7	721.1
NAFTA partners, total	68.3	83.0	97.9	125.0	143.0	110.2	123.1	150.5	171.6
Canada	70.0	84.0	97.4	119.1	133.2	100.2	104.2	115.1	149.9
Mexico	-1.7	-1.0	0.5	6.0	9.8	10.0	19.0	35.4	21.7
Europe Four, total	133.9	123.1	142.8	188.6	186.5	136.6	183.5	184.0	64.0
France	15.3	12.4	12.9	16.9	22.9	-8.0	-7.3	-37.3	-55.6
Germany, Federal Republic of	84.8	63.8	69.5	86.5	104.6	128.0	148.3	162.7	83.9
Italy	15.7	26.6	21.7	27.5	19.2	8.6	0.1	1.3	10.4
United Kingdom	18.1	20.3	38.7	57.8	39.8	8.1	42.4	57.2	25.3
Other Western Europe, total	141.5	167.3	165.1	229.3	267.1	52.7	33.5	-98.8	81.2
Belgium	27.3	32.4	43.1	89.9	118.2	-25.1	24.9	-7.0	126.8
Greece	1.0	1.7	1.6	2.7	3.0	2.6	2.8	6.3	1.0
Ireland	48.2	78.3	57.4	78.1	93.8	79.0	30.1	49.5	-45.2
Netherlands	27.5	27.3	38.6	41.3	25.8	10.5	9.7	3.7	37.0
Portugal	0.3	0.2	0.3	0.3	0.9	0.5	0.6	0.2	0.2
Spain	20.9	21.9	23.9	29.4	33.9	10.0	18.9	26.0	45.6
Switzerland	16.2	5.5	0.1	-12.4	-8.6	-24.8	-53.6	-177.5	-84.2
Nordic Countries, total	33.9	32.5	34.4	41.0	30.0	23.3	14.0	12.2	10.7
Denmark	3.3	4.2	4.5	2.1	1.6	3.4	7.5	1.5	0.8
Finland	17.5	16.8	16.2	25.1	20.1	13.6	2.3	0.9	0.5
Iceland	0.1	0.2	0.3	0.2	0.0	0.0	0.2	0.2	0.1
Norway	0.7	2.0	3.3	5.3	4.2	3.1	1.3	6.8	6.4
Sweden	12.3	9.3	10.0	8.4	4.1	3.1	2.6	2.9	2.8
Central/Eastern Europe, total	3.0	3.7	8.6	9.2	-4.9	-7.9	0.9	6.2	1.1
Austria	2.8	2.7	4.6	7.8	4.2	10.5	14.2	9.4	8.0
Czech Republic	0.0	0.0	0.0	0.0	0.9	0.4	0.6	5.1	1.5
Czechoslovakia	0.0	0.8	1.7	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.0	-0.5	0.0	0.3	-0.6	-2.9	-7.2	-4.9	-6.9
Poland	0.2	0.7	1.8	0.6	5.7	9.1	9.9	2.5	2.2
Russia	0.0	0.0	0.6	0.3	1.5	0.8	0.9	0.5	1.0
Slovakia	0.0	0.0	0.0	0.0	0.0	-0.2	-0.1	0.3	0.6
Slovenia	0.0	0.0	0.0	0.1	-16.7	-25.7	-17.3	-6.7	-5.2
Asia, total	205.7	202.0	190.3	171.3	238.0	209.0	181.8	261.9	251.9
China	0.5	1.4	2.3	1.5	1.3	0.6	-7.9	-8.6	-5.6
Hong Kong	3.8	4.1	4.4	4.1	9.6	6.6	7.8	17.0	9.3
India	0.6	0.6	1.2	0.7	1.5	1.8	1.5	2.9	4.6
Indonesia	1.5	2.4	2.1	2.6	3.4	4.1	4.2	4.5	0.7
Japan	177.2	174.7	152.3	138.3	188.6	151.5	128.0	190.2	194.3
South Korea	3.4	2.5	3.7	3.4	5.3	11.9	12.8	12.1	12.6
Malaysia	1.2	1.1	1.9	2.5	2.7	3.0	2.6	4.2	3.1
Philippines	1.4	1.5	1.7	1.9	2.8	2.8	3.6	4.4	4.0
Singapore	1.6	2.0	2.0	1.9	3.2	3.6	3.6	3.4	4.1
Taiwan	6.7	7.6	14.0	9.9	14.1	17.0	19.1	23.7	17.9
Thailand	7.8	4.0	4.8	4.6	5.5	6.1	6.5	8.1	6.9
South America, total	6.9	9.0	14.5	19.2	36.0	25.4	35.2	42.3	42.9
Argentina	2.3	4.8	8.8	10.1	14.5	7.0	8.5	8.1	13.2
Brazil	1.7	1.4	2.5	4.5	15.7	12.9	22.2	25.2	19.9
Chile	1.3	1.1	1.3	2.5	2.8	2.0	1.6	5.4	6.2
Peru	1.7	1.7	1.8	2.1	2.9	3.6	2.9	3.6	3.5
Africa, total	3.3	3.1	2.6	3.5	3.7	4.2	4.9	5.0	4.2
Kenya	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.2	0.0
Nigeria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
South Africa, Republic of	3.3	3.0	2.6	3.4	3.6	4.1	4.8	4.7	4.0
All other countries	32.7	33.5	40.8	46.3	56.6	57.1	71.7	90.4	93.4

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Balance								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Life science technologies									
Total, all countries	1,631.5	1,038.5	959.7	1,414.1	1,976.9	1,961.1	1,357.6	153.5	-2,252.5
NAFTA partners, total	540.7	410.9	341.6	513.3	589.5	456.1	391.0	137.1	170.5
Canada	501.7	407.5	391.0	401.2	487.6	556.3	536.5	320.1	378.2
Mexico	39.0	3.4	-49.4	112.1	101.8	-100.1	-145.5	-183.0	-207.6
Europe Four, total	162.3	-251.2	-252.3	-231.3	-66.9	-195.0	-661.1	-1,357.8	-2,807.5
France	67.2	37.0	126.7	80.9	62.3	170.3	40.3	61.1	103.6
Germany, Federal Republic of	-140.0	-362.6	-407.8	-211.6	-48.7	-219.7	-228.5	-1,065.5	-2,293.4
Italy	176.5	169.1	180.1	107.6	94.0	142.8	96.0	92.3	27.6
United Kingdom	58.7	-94.6	-151.3	-208.1	-174.5	-288.4	-569.0	-445.7	-645.3
Other Western Europe, total	261.9	255.7	229.5	111.4	231.5	50.6	-365.4	-974.6	-1,394.6
Belgium	81.4	124.0	138.1	166.2	202.7	140.5	71.0	2.9	176.5
Greece	11.0	18.8	19.1	21.5	16.6	29.5	23.4	28.6	31.7
Ireland	-15.5	-48.5	-59.5	-102.4	-71.9	-215.7	-480.4	-1,173.2	-2,046.1
Netherlands	82.4	91.4	77.2	16.4	85.4	186.9	195.4	359.4	559.6
Portugal	9.3	12.5	15.5	13.0	15.1	35.4	32.7	28.6	39.3
Spain	70.8	75.5	75.0	63.0	67.1	94.7	111.4	107.6	135.4
Switzerland	22.5	-18.1	-35.9	-66.1	-83.6	-220.7	-318.8	-328.4	-290.9
Nordic Countries, total	62.2	54.9	61.5	37.3	36.6	-31.5	-15.5	-18.1	-11.4
Denmark	0.2	-1.5	-2.4	-4.0	-12.3	-3.9	-22.3	-60.9	-59.5
Finland	3.4	-13.8	-21.2	-14.3	-26.6	-43.1	-36.6	-47.9	-55.1
Iceland	0.8	1.6	-0.2	0.2	0.4	1.0	0.6	0.6	-3.3
Norway	22.3	19.0	16.7	19.0	14.7	15.5	19.2	12.3	11.9
Sweden	35.5	49.6	68.7	36.3	60.5	-0.8	23.8	77.8	94.6
Central/Eastern Europe, total	41.5	38.5	56.4	22.9	-58.7	-177.2	-94.7	-28.9	55.7
Austria	27.6	21.0	35.7	29.3	29.5	8.9	3.0	-16.6	-7.9
Czech Republic	0.0	0.0	0.0	6.9	9.8	11.2	10.8	9.0	7.7
Czechoslovakia	5.6	4.4	7.6	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	1.1	5.3	2.3	-0.6	3.2	0.9	2.6	2.5	-5.3
Poland	7.2	7.7	11.2	10.3	16.5	19.0	20.5	19.8	22.7
Russia	0.0	0.0	-0.5	-26.9	-117.9	-217.2	-136.5	-49.3	34.9
Slovakia	0.0	0.0	0.0	0.6	1.1	1.1	3.0	3.1	1.4
Slovenia	0.0	0.0	0.2	3.3	-0.8	-1.1	1.8	2.5	2.2
Asia, total	467.5	304.2	377.1	573.0	751.1	1,276.9	1,434.6	1,691.2	954.6
China	73.7	78.6	85.4	94.2	24.1	42.2	16.1	-3.6	-33.9
Hong Kong	31.0	51.9	67.3	97.2	105.3	130.9	153.7	194.6	208.6
India	61.0	38.1	40.7	47.3	49.8	63.6	64.5	97.6	64.1
Indonesia	9.4	12.3	8.9	15.3	7.4	13.8	12.7	20.5	8.8
Japan	5.1	-159.1	-121.8	-41.1	108.7	455.2	543.8	719.9	350.8
South Korea	159.8	191.5	177.5	223.0	307.4	341.9	395.5	365.0	180.4
Malaysia	9.7	13.4	15.2	21.9	23.6	33.4	28.8	57.4	42.9
Philippines	9.3	8.7	9.5	12.9	13.9	17.0	20.9	31.6	16.1
Singapore	-0.1	-29.6	-44.7	-35.5	-6.3	6.4	-9.7	-5.4	-64.5
Taiwan	88.7	73.6	104.5	98.3	75.1	108.7	133.3	150.9	155.9
Thailand	20.0	24.9	34.7	39.6	42.1	63.8	74.9	62.7	25.2
South America, total	135.3	173.5	204.7	238.9	287.2	358.4	407.2	439.9	441.8
Argentina	21.3	38.9	51.7	56.9	99.3	75.5	81.0	88.3	43.7
Brazil	91.9	108.8	112.7	131.5	140.5	227.8	263.9	285.4	336.4
Chile	15.1	21.4	33.4	41.2	36.3	37.2	44.2	44.2	45.0
Peru	7.0	4.4	6.9	9.3	11.2	18.0	18.1	22.1	16.7
Africa, total	42.8	45.2	45.4	38.9	34.3	52.3	59.2	58.3	59.4
Kenya	0.5	0.5	1.3	0.5	0.5	0.6	1.4	0.9	1.2
Nigeria	12.2	10.5	11.2	3.6	2.1	1.0	4.1	2.1	4.0
South Africa, Republic of	30.2	34.3	32.9	34.8	31.7	50.7	53.7	55.3	54.2
All other countries	-82.7	6.8	-104.3	109.6	172.3	170.5	202.3	206.2	279.1

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Balance								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Opto-electronics								
Total, all countries	-589.4	-1,382.8	-1,930.7	-1,810.4	-1,597.6	-1,615.0	-1,724.7	-1,810.2	-2,007.8
NAFTA partners, total	-5.9	1.2	-110.1	19.4	95.4	54.8	-4.5	-125.3	-183.7
Canada	31.0	28.7	49.4	61.8	84.3	90.0	112.5	185.6	192.1
Mexico	-36.9	-27.5	-159.5	-42.4	11.0	-35.2	-117.0	-310.9	-375.8
Europe Four, total	146.5	106.2	129.9	136.0	196.6	217.5	206.6	268.4	387.6
France	30.0	28.8	26.3	20.9	27.7	35.9	39.5	58.2	58.1
Germany, Federal Republic of	44.1	33.4	68.5	69.0	110.5	133.9	117.9	109.1	119.3
Italy	23.6	21.6	18.2	6.4	12.0	8.2	16.3	22.2	38.3
United Kingdom	48.8	22.4	17.0	39.7	46.3	39.5	32.9	78.9	171.8
Other Western Europe, total	15.2	26.1	29.7	11.9	-13.0	34.1	26.9	45.8	31.3
Belgium	-3.5	0.6	5.3	0.8	1.2	8.0	5.1	5.6	8.0
Greece	0.4	0.6	1.1	0.4	0.4	0.9	1.3	0.9	1.7
Ireland	0.2	4.7	-1.1	1.7	-8.6	-2.9	6.3	13.1	8.0
Netherlands	15.4	15.1	14.2	17.8	5.0	25.5	16.8	31.4	42.9
Portugal	0.5	1.6	0.8	1.5	1.3	1.6	1.5	2.3	0.7
Spain	7.0	6.6	19.0	5.5	6.2	14.2	17.1	16.3	4.2
Switzerland	-4.9	-3.2	-9.6	-15.9	-18.5	-13.2	-21.2	-23.8	-34.2
Nordic Countries, total	12.0	4.1	9.5	8.2	15.8	9.8	14.9	6.4	29.1
Denmark	2.0	-1.0	0.3	0.1	0.4	-0.5	0.8	-1.0	-0.1
Finland	5.2	2.7	2.7	2.6	2.0	2.3	2.6	3.2	6.3
Iceland	0.0	0.1	0.0	0.9	0.1	0.1	0.1	0.1	0.5
Norway	2.4	1.6	2.1	4.2	6.8	5.7	4.3	1.5	3.6
Sweden	2.4	0.7	4.3	0.3	6.4	2.2	7.0	2.6	18.8
Central/Eastern Europe, total	-9.9	-1.9	-5.1	-6.8	3.0	1.9	3.7	9.1	11.0
Austria	-10.4	-3.0	-5.4	-2.2	0.2	-2.0	1.4	5.4	4.2
Czech Republic	0.0	0.0	0.0	0.1	0.4	0.9	0.5	0.7	1.0
Czechoslovakia	0.2	-0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.2	0.6	0.2	-1.7	-0.3	0.4	0.2	0.3	0.9
Poland	0.1	0.6	0.0	0.1	0.2	0.9	0.5	0.9	2.6
Russia	0.0	0.0	0.1	-3.2	1.8	1.2	0.1	1.0	0.9
Slovakia	0.0	0.0	0.0	0.1	0.0	0.1	0.4	0.1	0.2
Slovenia	0.0	0.0	-0.1	0.1	0.6	0.6	0.7	0.8	1.2
Asia, total	-806.3	-1,588.0	-2,054.1	-2,063.1	-1,969.5	-2,005.7	-2,018.7	-2,093.2	-2,342.7
China	-5.3	-13.4	-24.7	-49.3	-173.3	-331.0	-375.6	-455.5	-632.0
Hong Kong	4.6	2.2	-0.2	8.9	8.4	-12.2	5.6	16.3	26.2
India	1.8	0.9	2.0	2.7	6.5	11.1	2.7	1.1	2.2
Indonesia	0.4	0.4	1.5	0.8	0.8	0.3	-66.4	-65.0	-99.9
Japan	-686.5	-1,460.9	-1,881.5	-1,747.3	-1,295.7	-993.9	-680.5	-766.2	-859.4
South Korea	-22.0	-13.8	-21.7	-11.4	18.7	8.1	21.1	47.2	-1.1
Malaysia	-16.2	-23.9	-46.0	-135.4	-368.1	-489.1	-464.5	-343.4	-320.3
Philippines	2.2	-1.1	-2.5	-4.9	-12.1	-46.3	-85.7	-79.8	-45.2
Singapore	-51.9	-35.3	-42.5	-46.1	-38.8	-7.6	-159.9	-106.1	-93.4
Taiwan	-34.3	-45.3	-39.7	-73.8	-99.3	-119.9	-175.3	-277.3	-274.6
Thailand	1.0	2.2	1.2	-7.3	-16.7	-25.3	-40.3	-64.6	-45.2
South America, total	8.2	6.7	9.2	14.9	20.4	29.6	34.9	49.5	40.6
Argentina	1.2	2.3	4.3	6.0	6.7	6.5	6.2	8.2	6.7
Brazil	5.6	3.0	3.2	6.0	9.6	18.1	22.0	33.2	28.3
Chile	0.8	1.3	1.3	2.4	3.3	4.2	3.9	4.5	3.8
Peru	0.6	0.2	0.5	0.4	0.8	0.8	2.8	3.5	1.9
Africa, total	3.1	6.0	4.1	4.1	6.9	6.6	5.5	8.8	14.5
Kenya	0.4	0.2	0.2	0.2	0.1	0.2	0.1	0.7	0.3
Nigeria	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.2
South Africa, Republic of	2.7	5.8	3.8	3.9	6.7	6.3	5.3	8.1	14.1
All other countries	47.7	56.6	56.2	65.0	46.9	36.4	6.1	20.4	4.5

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Balance								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Computers and telecommunications									
Total, all countries	1,264.5	1,572.9	-1,279.3	-5,591.4	-9,580.7	-10,975.1	-8,566.0	-8,537.2	-15,928.2
NAFTA partners, total	2,666.1	2,428.1	2,811.7	2,988.7	2,285.9	1,210.2	2,156.4	2,470.8	2,025.5
Canada	2,167.4	1,766.4	2,078.1	2,125.7	1,726.0	1,476.4	2,671.5	3,158.2	2,643.7
Mexico	498.7	661.7	733.6	863.0	559.9	-266.2	-515.1	-687.5	-618.2
Europe Four, total	7,092.7	6,033.7	5,603.4	5,264.5	5,790.0	6,735.1	7,102.2	7,293.9	7,331.1
France	1,214.2	1,061.7	1,054.1	943.6	1,095.0	1,599.5	1,579.9	1,503.1	1,202.7
Germany, Federal Republic of	2,483.4	2,147.0	2,018.2	1,829.6	1,899.9	2,459.8	2,905.3	2,449.0	2,465.7
Italy	608.3	701.1	588.6	363.9	296.5	179.3	346.4	351.2	268.2
United Kingdom	2,786.8	2,123.9	1,942.5	2,127.3	2,498.7	2,496.5	2,270.7	2,990.7	3,394.4
Other Western Europe, total	3,382.4	3,101.9	3,158.1	2,936.0	3,511.1	4,114.5	3,962.1	4,968.3	4,683.5
Belgium	424.1	391.4	380.2	294.1	279.3	290.8	307.2	324.2	447.3
Greece	24.2	36.5	41.6	49.4	32.4	47.4	41.2	39.6	73.4
Ireland	377.8	145.4	119.3	-80.0	528.2	671.0	312.8	-9.7	-459.7
Netherlands	1,802.0	1,714.3	1,756.2	1,921.1	1,829.1	2,004.8	2,258.4	3,836.7	3,929.3
Portugal	45.9	50.1	56.3	47.2	71.6	69.5	61.1	91.9	66.1
Spain	311.6	377.9	414.8	327.6	373.9	545.6	514.0	294.6	197.6
Switzerland	396.9	386.3	389.8	376.6	396.5	485.5	467.4	391.1	429.4
Nordic Countries, total	497.2	434.5	457.8	403.9	375.0	506.4	516.2	441.1	397.2
Denmark	116.2	114.3	120.9	119.0	110.2	164.1	182.6	162.7	115.9
Finland	98.5	81.2	60.8	53.4	52.7	102.1	128.3	18.2	94.9
Iceland	3.1	13.9	15.9	5.3	7.4	36.4	23.1	13.9	14.1
Norway	105.0	79.9	93.9	79.0	64.1	60.9	79.3	112.8	16.3
Sweden	174.4	145.1	166.3	147.2	140.6	142.9	102.8	133.5	156.0
Central/Eastern Europe, total	140.8	235.2	343.2	507.5	435.4	508.2	358.6	176.5	46.4
Austria	107.9	144.4	98.7	119.1	102.3	142.1	126.8	114.3	109.1
Czech Republic	0.0	0.0	0.0	64.1	52.3	75.5	71.0	52.9	72.8
Czechoslovakia	8.4	23.0	70.0	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	11.3	17.0	29.0	66.4	41.9	29.1	-81.6	-307.6	-698.5
Poland	13.3	50.8	53.2	63.1	56.2	55.3	44.8	74.4	96.7
Russia	0.0	0.0	85.9	176.3	158.3	180.0	166.8	213.9	393.3
Slovakia	0.0	0.0	0.0	4.0	8.2	9.0	13.0	14.8	52.1
Slovenia	0.0	0.0	6.4	14.5	16.2	17.2	17.9	13.8	20.9
Asia, total	-16,262.8	-14,618.3	-17,747.5	-22,622.2	-27,874.2	-30,934.6	-29,842.9	-33,560.4	-39,478.7
China	118.4	-63.8	-68.5	-213.3	-1,214.9	-1,889.1	-2,116.1	-2,916.4	-3,034.5
Hong Kong	-437.5	-211.6	-30.2	21.3	366.2	1,104.2	1,043.9	1,807.1	1,455.9
India	86.7	77.2	71.4	61.8	97.1	145.8	150.0	41.2	190.1
Indonesia	83.8	27.2	-73.6	-230.4	-386.7	-269.1	-67.3	-113.6	-499.4
Japan	-8,823.4	-7,378.3	-8,320.2	-10,378.2	-11,560.5	-10,824.7	-8,466.2	-8,966.7	-9,556.9
South Korea	-1,049.5	-542.8	-709.7	-1,049.2	-1,015.3	-1,982.3	-792.8	-1,251.2	-2,465.6
Malaysia	-164.6	-538.2	-1,106.9	-1,791.2	-2,705.5	-3,375.9	-3,224.8	-3,710.8	-5,801.8
Philippines	-11.5	-23.0	-100.4	-115.3	-45.0	-230.2	-633.2	-1,317.2	-2,093.2
Singapore	-3,412.9	-3,534.3	-4,479.0	-5,476.3	-6,844.4	-8,100.2	-9,319.4	-9,214.8	-8,958.1
Taiwan	-2,075.9	-1,873.8	-2,085.6	-2,540.2	-3,367.0	-4,373.7	-5,334.0	-6,357.8	-6,810.7
Thailand	-576.4	-556.8	-845.0	-911.1	-1,198.2	-1,139.6	-1,083.0	-1,560.1	-1,904.6
South America, total	592.4	723.9	1,032.5	1,326.3	2,017.8	2,180.0	2,781.0	3,778.0	3,636.7
Argentina	145.4	252.1	354.6	467.1	717.9	493.7	615.8	880.4	899.3
Brazil	326.4	322.7	475.3	626.2	991.8	1,311.3	1,736.4	2,242.0	2,024.6
Chile	89.9	117.0	155.7	177.8	213.6	251.6	283.6	397.6	464.3
Peru	30.7	32.1	46.9	55.2	94.5	123.3	145.2	258.0	248.5
Africa, total	158.2	168.6	178.0	223.0	189.9	229.2	213.8	264.2	344.9
Kenya	4.5	4.7	1.4	3.4	5.4	4.6	2.8	3.9	7.5
Nigeria	15.1	16.5	25.1	40.7	11.9	16.4	13.4	16.3	20.0
South Africa, Republic of	138.6	147.4	151.5	178.9	172.6	208.2	197.5	244.0	317.5
All other countries	2,997.5	3,065.4	2,883.5	3,381.1	3,688.4	4,475.9	4,186.6	5,630.5	5,085.2

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Balance								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Electronics									
Total, all countries	-3,563.0	-3,682.4	-4,452.3	-6,009.8	-9,408.7	-7,009.3	-1,550.1	1,068.7	4,233.1
NAFTA partners, total	383.3	545.7	591.6	1,049.0	2,148.2	4,257.8	4,406.5	4,782.7	4,929.0
Canada	420.2	586.8	576.5	1,044.6	1,853.8	3,788.4	3,129.8	2,886.0	2,903.0
Mexico	-36.9	-41.1	15.1	4.4	294.5	469.4	1,276.8	1,896.8	2,026.1
Europe Four, total	1,108.0	1,270.6	1,330.1	1,701.2	1,440.2	1,710.4	1,200.7	1,506.1	1,362.4
France	283.7	271.4	200.1	205.8	-85.1	-241.4	-392.2	-92.3	-176.0
Germany, Federal Republic of	187.6	201.9	140.6	226.7	140.8	173.2	93.7	17.4	173.7
Italy	139.9	192.4	147.1	101.8	1.6	114.2	212.7	363.4	358.9
United Kingdom	496.8	604.9	842.3	1,166.9	1,383.0	1,664.5	1,286.5	1,217.6	1,005.8
Other Western Europe, total	209.0	221.2	201.0	245.4	333.8	-87.4	653.2	1,066.7	715.3
Belgium	34.3	30.7	27.7	39.4	50.1	52.2	6.8	28.4	20.4
Greece	0.2	1.3	5.4	1.3	1.0	2.1	2.5	1.2	2.7
Ireland	26.7	18.2	15.1	52.7	65.8	-464.0	-30.4	78.8	177.2
Netherlands	118.6	133.9	88.1	114.4	175.7	225.2	605.3	858.4	451.9
Portugal	2.6	5.7	-0.9	-28.3	-2.2	-12.4	-10.5	-6.5	-14.8
Spain	-11.0	-10.8	12.7	27.1	-7.8	36.1	31.8	40.2	51.5
Switzerland	37.6	42.2	52.9	38.8	51.1	73.4	47.6	66.2	26.5
Nordic Countries, total	54.8	72.4	104.3	133.8	198.7	244.1	250.0	300.6	280.5
Denmark	11.1	12.5	12.6	17.7	31.7	43.9	40.6	43.5	36.5
Finland	12.6	13.2	18.5	28.3	44.0	44.2	34.1	41.7	78.2
Iceland	0.1	0.2	0.2	-6.1	0.5	0.8	0.7	1.4	0.9
Norway	10.6	15.1	19.4	21.7	31.1	32.5	30.4	27.9	37.5
Sweden	20.4	31.4	53.6	72.1	91.4	122.7	144.3	186.0	127.4
Central/Eastern Europe, total	2.3	12.6	16.3	11.7	13.3	12.2	-7.5	-16.2	-45.6
Austria	1.5	9.1	8.9	1.1	-3.6	-8.1	-23.3	-28.1	-56.4
Czech Republic	0.0	0.0	0.0	2.1	4.0	8.1	4.7	2.6	8.0
Czechoslovakia	0.2	0.9	3.6	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.4	1.0	0.3	1.9	0.2	-2.7	-1.4	-7.4	-15.2
Poland	0.3	1.6	1.4	2.1	3.8	3.4	3.4	3.3	5.9
Russia	0.0	0.0	1.9	3.6	7.3	10.1	4.0	10.6	11.4
Slovakia	0.0	0.0	0.0	0.1	0.3	0.1	0.1	0.8	0.3
Slovenia	0.0	0.0	0.3	0.7	1.4	1.3	5.0	2.0	0.5
Asia, total	-5,613.3	-6,077.4	-6,960.2	-9,522.1	-13,921.3	-13,785.9	-8,800.2	-7,141.4	-3,580.4
China	19.7	14.9	14.7	3.3	-61.5	-97.3	-72.2	-146.1	-43.4
Hong Kong	157.6	181.7	293.3	234.5	225.3	400.4	715.9	478.8	539.6
India	42.0	26.6	26.2	23.4	30.9	64.8	43.0	21.7	31.9
Indonesia	-12.3	-19.7	-41.1	-43.2	-50.6	-101.9	-33.4	-104.7	-145.2
Japan	-1,827.9	-2,265.8	-2,753.8	-3,782.3	-5,404.9	-6,669.9	-4,058.7	-3,474.7	-2,388.1
South Korea	-1,393.2	-1,494.3	-1,658.8	-2,030.7	-3,391.9	-4,972.2	-3,610.6	-2,899.2	-1,800.0
Malaysia	-1,174.4	-1,226.0	-1,549.8	-2,358.1	-2,970.8	-1,238.2	-1,686.5	-1,414.8	-406.3
Philippines	-473.7	-547.1	-712.8	-931.9	-1,234.1	-467.9	-305.9	-246.9	-383.8
Singapore	-498.8	-523.6	-406.2	-25.7	-119.5	118.7	467.6	780.4	1,034.5
Taiwan	-110.2	111.8	87.5	-205.7	-377.9	-590.2	-145.5	-196.6	-207.0
Thailand	-342.0	-335.9	-259.4	-405.6	-566.3	-232.1	-113.9	60.7	187.5
South America, total	121.4	121.7	105.2	113.3	156.6	229.6	286.7	364.2	378.7
Argentina	10.0	14.1	26.6	17.9	22.6	14.5	11.3	28.8	22.4
Brazil	106.9	103.3	72.5	87.6	122.1	197.3	258.6	315.7	339.4
Chile	4.0	3.7	5.3	6.8	9.6	14.3	12.7	11.8	12.8
Peru	0.5	0.6	0.8	1.1	2.4	3.5	4.2	7.9	4.1
Africa, total	16.0	21.1	13.0	21.3	19.9	27.6	14.5	18.2	18.4
Kenya	-0.4	-0.1	-1.9	-0.6	0.4	-0.4	-0.2	1.7	0.1
Nigeria	0.8	0.6	0.3	1.8	0.8	0.8	0.2	0.4	0.1
South Africa, Republic of	15.5	20.6	14.7	20.1	18.7	27.2	14.5	16.0	18.1
All other countries	155.4	129.8	146.4	236.6	201.9	382.3	445.9	187.6	174.7

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Balance								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Computer-integrated manufacturing									
Total, all countries	1,419.1	1,461.7	1,728.1	1,816.8	2,291.3	2,522.1	2,842.9	2,328.5	719.6
NAFTA partners, total	514.1	514.7	582.3	560.0	713.1	482.2	474.6	814.7	833.6
Canada	383.4	356.7	346.9	354.3	500.0	505.8	386.0	581.5	544.3
Mexico	130.8	158.1	235.4	205.7	213.1	-23.6	88.6	233.2	289.3
Europe Four, total	405.6	402.6	425.0	466.5	543.4	546.7	359.6	47.0	-168.1
France	120.3	152.4	165.1	204.2	251.4	255.6	315.6	255.7	139.9
Germany, Federal Republic of	93.6	69.1	28.7	16.4	32.2	82.7	-106.6	-317.2	-348.2
Italy	81.5	71.7	93.7	76.8	83.2	114.1	44.8	17.4	14.2
United Kingdom	110.2	109.4	137.5	169.1	176.6	94.3	105.7	91.0	26.0
Other Western Europe, total	124.7	110.2	135.9	194.8	177.3	26.6	-32.6	-144.8	4.1
Belgium	29.6	25.7	33.5	14.3	27.7	29.4	34.0	36.3	33.0
Greece	2.3	2.5	4.2	3.7	1.3	2.8	4.0	3.1	3.3
Ireland	12.7	14.3	27.5	95.2	81.8	73.8	47.5	104.7	205.7
Netherlands	65.0	34.1	57.4	70.4	91.4	-31.6	-88.5	-220.5	-122.2
Portugal	4.3	5.6	6.5	5.6	7.3	5.3	6.9	0.6	2.4
Spain	25.1	32.1	32.2	26.1	22.6	25.3	27.8	31.7	-6.1
Switzerland	-14.2	-4.0	-25.5	-20.4	-54.8	-78.5	-64.3	-100.8	-112.1
Nordic Countries, total	-17.5	12.6	1.4	-36.2	-47.2	-83.5	-83.5	-50.2	-69.8
Denmark	7.4	7.5	6.1	6.0	6.1	7.1	13.4	5.4	-0.5
Finland	1.5	-0.9	2.4	-6.9	-4.6	1.9	-2.5	-7.3	-23.6
Iceland	0.3	0.6	0.6	0.9	0.7	0.5	0.9	1.0	0.4
Norway	5.7	7.1	9.9	13.5	5.0	-2.7	-3.8	9.1	8.7
Sweden	-32.4	-1.6	-17.6	-49.7	-54.3	-90.4	-91.5	-58.4	-54.8
Central/Eastern Europe, total	-0.7	8.0	13.1	23.3	50.4	10.8	-4.1	-14.2	-16.6
Austria	-4.4	5.4	8.9	7.3	10.9	0.9	-12.5	-7.3	-17.3
Czech Republic	0.0	0.0	0.0	-8.4	-9.4	-15.0	-22.3	-34.8	-30.5
Czechoslovakia	2.2	0.3	-1.2	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	-0.3	0.7	0.4	0.2	2.4	4.3	1.5	1.0	4.4
Poland	1.8	1.6	2.3	1.4	1.8	0.3	1.2	2.8	2.8
Russia	0.0	0.0	2.3	20.2	37.9	13.3	22.3	21.6	22.4
Slovakia	0.0	0.0	0.0	1.9	2.3	0.4	0.3	-0.1	1.2
Slovenia	0.0	0.0	0.4	0.7	4.5	6.6	5.4	2.6	0.4
Asia, total	113.4	155.6	261.4	256.6	505.8	1,119.5	1,699.1	1,142.3	-392.0
China	59.7	87.9	105.8	153.3	170.8	133.0	179.0	136.2	150.4
Hong Kong	33.2	41.8	59.0	86.1	106.8	101.0	127.2	138.4	92.2
India	35.3	17.6	17.3	29.8	38.1	31.9	57.7	27.8	27.0
Indonesia	4.3	5.4	11.7	9.7	8.1	14.9	16.2	15.0	7.6
Japan	-510.5	-585.7	-628.3	-956.9	-1,148.8	-1,501.2	-1,508.1	-2,434.1	-2,553.9
South Korea	198.5	277.9	284.9	365.5	668.5	1,202.3	1,396.6	992.6	290.6
Malaysia	56.7	54.0	74.9	113.1	116.2	184.2	186.6	294.1	213.6
Philippines	40.9	37.3	30.3	54.1	47.6	101.2	88.6	159.9	195.1
Singapore	90.4	83.5	115.0	161.4	159.2	287.6	366.9	453.5	304.8
Taiwan	84.1	118.2	167.4	216.9	304.2	526.8	733.0	1,309.7	852.0
Thailand	20.7	17.5	23.3	23.6	34.9	37.9	55.4	49.3	28.5
South America, total	46.0	44.6	41.8	65.4	69.8	92.4	103.5	189.9	173.6
Argentina	4.6	8.6	11.1	17.0	27.4	19.9	21.7	25.9	25.7
Brazil	32.5	26.9	22.1	33.6	26.1	51.5	57.1	134.1	116.2
Chile	7.5	6.8	7.3	12.0	12.7	15.7	17.6	22.5	24.0
Peru	1.4	2.3	1.4	2.9	3.6	5.4	7.2	7.4	7.7
Africa, total	13.2	18.7	14.5	13.4	14.3	16.2	26.9	27.2	21.9
Kenya	0.2	0.8	0.5	0.2	0.8	0.5	0.7	0.6	0.2
Nigeria	0.7	1.6	1.9	1.1	2.3	2.2	2.8	1.2	1.4
South Africa, Republic of	12.2	16.4	12.2	12.1	11.2	13.5	23.4	25.4	20.3
All other countries	220.2	194.7	252.7	273.2	264.6	311.2	299.4	316.4	332.9

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Balance								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Material design								
Total, all countries	5,357.5	5,174.6	5,605.3	6,351.3	9,314.4	2,991.9	1,666.2	1,920.6	153.0
NAFTA partners, total	913.2	901.0	1,131.1	1,092.4	1,245.5	599.9	353.5	389.6	88.5
Canada	757.6	718.7	895.3	855.2	893.4	159.4	200.8	258.2	57.4
Mexico	155.6	182.3	235.8	237.1	352.1	440.5	152.6	131.4	31.0
Europe Four, total	76.8	149.2	79.3	-156.2	237.1	66.5	110.1	92.4	-32.5
France	-46.8	18.5	-17.2	-84.1	90.8	1.1	45.5	55.8	17.2
Germany, Federal Republic of	11.1	0.9	-11.5	-60.7	-32.9	-79.1	-78.7	-78.4	-80.3
Italy	44.9	52.5	67.9	16.2	39.4	19.9	11.7	-1.8	8.5
United Kingdom	67.5	77.4	40.1	-27.6	139.9	124.6	131.6	116.8	22.1
Other Western Europe, total	72.6	60.2	59.0	48.7	100.8	75.1	81.3	66.5	23.1
Belgium	2.0	1.4	2.0	2.6	3.8	2.4	5.1	4.3	0.3
Greece	0.2	0.5	0.1	0.2	0.2	0.3	1.4	1.6	0.1
Ireland	38.5	35.8	24.4	40.9	45.4	32.7	38.5	41.9	15.0
Netherlands	8.6	14.5	16.6	7.5	7.9	4.8	11.4	-3.7	-4.6
Portugal	18.2	19.6	21.6	19.9	16.8	12.7	2.3	0.8	0.5
Spain	4.7	-11.7	-6.9	-21.9	24.0	21.7	22.8	20.7	17.0
Switzerland	0.4	0.1	1.2	-0.4	2.7	0.4	-0.1	0.9	-5.1
Nordic Countries, total	1.3	-5.9	2.9	-1.8	5.3	11.8	23.9	5.3	-48.2
Denmark	-3.0	-6.9	0.4	-7.8	-7.5	-4.1	-4.2	-12.1	-44.2
Finland	1.5	1.7	3.2	1.8	1.0	0.7	-1.6	-6.7	-13.7
Iceland	1.2	1.8	0.7	1.2	0.4	0.7	0.3	0.1	0.1
Norway	0.5	1.8	6.2	6.6	6.1	5.3	13.0	7.0	6.1
Sweden	1.0	-4.1	-7.6	-3.6	5.3	9.3	16.4	17.1	3.6
Central/Eastern Europe, total	0.1	0.4	9.2	17.7	8.7	6.7	23.8	18.0	10.7
Austria	0.3	0.7	4.8	5.7	-1.1	2.5	5.7	5.0	6.3
Czech Republic	0.0	0.0	0.0	0.6	1.0	-2.0	0.1	0.3	-2.9
Czechoslovakia	0.0	0.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.0	0.0	0.1	0.2	1.4	0.6	2.1	0.3	0.1
Poland	-0.2	-0.4	3.4	8.8	5.7	3.2	5.8	5.1	2.8
Russia	0.0	0.0	0.0	0.2	1.1	2.4	5.3	4.2	2.9
Slovakia	0.0	0.0	0.0	1.8	0.6	0.1	4.6	3.0	1.4
Slovenia	0.0	0.0	0.1	0.4	0.1	0.0	0.2	0.1	0.1
Asia, total	4,324.0	4,147.5	4,383.8	5,322.4	7,606.5	2,128.2	913.8	1,144.8	-6.3
China	7.8	3.6	20.0	19.3	39.1	54.6	69.4	117.2	16.3
Hong Kong	328.5	299.3	294.0	375.8	553.3	294.9	95.5	85.6	98.6
India	-0.9	-0.8	1.3	1.3	2.9	1.5	10.2	0.2	-1.7
Indonesia	11.9	6.5	14.1	29.1	37.3	53.9	5.3	3.9	0.0
Japan	-48.2	36.7	-99.8	-110.5	282.3	-46.4	-100.6	-171.1	-124.8
South Korea	730.4	595.7	739.6	811.7	1,107.4	241.5	54.5	98.4	-6.8
Malaysia	1,310.0	1,311.7	1,302.0	1,758.3	2,526.3	438.3	174.3	199.2	-62.3
Philippines	494.0	479.3	579.0	686.4	1,136.4	221.1	144.1	301.3	2.1
Singapore	635.6	646.5	765.3	872.2	713.4	372.7	193.2	148.5	47.3
Taiwan	374.1	320.5	408.5	373.9	521.3	138.1	115.7	160.6	28.2
Thailand	481.0	448.6	359.8	505.1	686.8	358.0	152.1	201.0	-3.1
South America, total	13.4	8.3	23.6	39.3	35.8	28.4	55.5	95.2	53.0
Argentina	2.0	1.9	6.6	17.2	8.3	5.4	6.3	8.2	7.1
Brazil	10.9	5.8	12.0	16.7	21.4	18.9	42.7	81.1	42.1
Chile	0.3	0.5	4.7	5.4	4.9	3.2	5.2	5.1	3.3
Peru	0.2	0.2	0.3	0.1	1.1	0.9	1.2	0.8	0.5
Africa, total	1.2	1.3	1.8	2.2	3.1	3.5	4.7	3.1	11.1
Kenya	-0.1	0.0	0.0	0.0	0.0	-0.1	0.1	0.0	0.0
Nigeria	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0
South Africa, Republic of	1.2	1.3	1.8	2.2	3.1	3.6	4.5	3.1	11.1
All other countries	-45.1	-87.5	-85.5	-13.3	71.6	71.8	99.6	105.7	53.5

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Balance								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Aerospace									
Total, all countries	25,441.2	29,114.4	29,123.3	25,183.1	23,364.5	19,977.0	24,940.8	30,571.1	39,285.1
NAFTA partners, total	-9.2	-53.4	485.9	-35.1	-178.3	-150.5	-428.3	-841.2	-1,060.5
Canada	-341.2	-524.8	-277.0	-441.2	-765.8	-252.5	-545.4	-1,040.7	-1,716.6
Mexico	332.0	471.4	762.9	406.1	587.5	102.0	117.1	199.5	656.1
Europe Four, total	5,130.2	5,890.9	3,462.2	1,831.3	2,184.3	1,036.5	1,393.9	2,885.1	4,411.3
France	529.6	906.9	-232.6	-682.9	-524.9	-752.0	-699.5	-1,121.8	-1,055.5
Germany, Federal Republic of	1,902.4	2,937.0	2,078.8	1,144.8	779.0	742.9	854.7	1,283.7	2,363.2
Italy	344.9	446.0	688.8	180.4	716.2	642.0	391.0	197.5	64.8
United Kingdom	2,353.2	1,600.9	927.2	1,189.0	1,214.0	403.6	847.7	2,525.7	3,038.8
Other Western Europe, total	3,424.7	3,968.6	2,414.8	1,455.9	2,662.1	3,151.4	3,625.7	3,108.6	2,931.6
Belgium	545.9	694.2	301.7	149.9	220.8	169.8	362.6	392.8	556.9
Greece	44.5	242.1	72.6	118.6	72.3	557.7	90.5	161.2	522.7
Ireland	270.7	345.7	416.3	159.1	166.4	147.9	138.6	131.3	215.5
Netherlands	1,201.7	735.2	285.9	385.2	1,126.4	1,747.1	1,170.0	1,230.7	790.7
Portugal	132.8	49.5	213.7	40.8	310.4	39.9	49.6	59.9	75.3
Spain	1,014.1	777.1	586.4	328.7	380.1	194.0	207.4	234.7	153.8
Switzerland	215.0	1,124.8	538.3	273.5	385.7	295.0	1,607.1	897.9	616.5
Nordic Countries, total	1,578.3	1,751.1	958.1	589.8	470.5	604.0	1,919.0	923.9	1,712.4
Denmark	302.1	431.5	324.3	77.1	109.1	192.7	269.7	213.0	482.1
Finland	230.7	192.9	71.4	126.4	142.4	136.6	1,208.3	420.4	583.7
Iceland	141.3	39.4	4.5	3.5	3.3	1.7	59.2	1.6	69.0
Norway	283.7	366.6	235.5	150.4	116.7	42.9	160.0	163.9	168.3
Sweden	620.6	720.5	322.5	232.3	99.0	230.2	221.8	124.9	409.4
Central/Eastern Europe, total	171.3	204.4	571.3	452.0	490.9	322.7	74.7	594.5	1,174.6
Austria	84.8	99.7	191.2	93.9	17.0	102.3	15.5	165.3	198.3
Czech Republic	0.0	0.0	0.0	21.0	15.7	8.5	3.3	173.3	122.1
Czechoslovakia	0.5	3.3	153.0	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	3.1	95.2	87.1	160.4	35.0	3.7	6.8	3.8	3.9
Poland	82.9	6.2	117.9	153.8	75.8	83.3	50.0	264.5	7.1
Russia	0.0	0.0	21.2	21.5	344.0	121.7	-4.4	-25.1	839.2
Slovakia	0.0	0.0	0.0	0.1	0.0	0.1	0.5	11.7	0.2
Slovenia	0.0	0.0	0.9	1.4	3.4	3.1	2.9	1.0	3.8
Asia, total	8,800.0	10,585.2	12,366.4	13,653.2	12,351.0	10,622.2	11,664.5	14,856.3	17,293.2
China	781.2	1,207.9	2,085.7	2,240.0	1,928.9	1,041.6	1,619.5	2,126.3	3,492.1
Hong Kong	559.4	751.9	648.7	558.3	400.4	434.9	708.8	188.8	468.3
India	26.2	27.5	21.4	498.3	204.0	101.2	392.5	312.9	458.7
Indonesia	406.6	115.5	444.7	772.1	446.6	98.3	222.9	501.0	285.4
Japan	3,499.2	2,962.8	3,598.6	2,633.0	3,118.3	2,580.6	2,308.0	2,945.0	3,928.4
South Korea	1,017.5	1,521.4	1,541.3	1,453.1	1,657.9	2,242.6	2,163.5	2,314.4	1,663.8
Malaysia	438.9	660.8	817.4	1,507.6	977.1	273.2	309.6	1,413.3	1,358.7
Philippines	197.4	39.8	60.6	393.5	46.0	178.0	269.1	103.1	54.2
Singapore	718.8	1,158.3	806.8	1,256.7	1,581.8	1,258.2	1,288.5	1,606.6	1,906.8
Taiwan	613.5	1,265.2	1,333.4	2,038.6	1,662.0	1,766.6	1,426.1	2,215.2	2,864.2
Thailand	541.3	874.0	1,007.9	302.0	328.0	647.1	956.0	1,129.8	812.8
South America, total	862.6	1,451.6	1,381.1	754.2	320.2	778.1	939.3	1,116.0	1,229.5
Argentina	98.1	57.3	273.9	208.7	98.1	164.2	61.7	133.6	278.4
Brazil	570.6	1,227.9	881.8	486.2	168.4	414.4	526.5	689.6	465.0
Chile	168.3	146.5	213.1	47.7	47.3	157.6	342.0	270.2	448.0
Peru	25.6	19.9	12.2	11.6	6.4	41.8	9.0	22.5	38.1
Africa, total	230.1	423.5	291.2	336.5	139.2	167.6	181.5	291.3	809.4
Kenya	5.7	6.0	7.9	9.0	9.1	6.8	10.9	90.9	47.0
Nigeria	38.9	10.8	5.0	5.2	13.9	4.8	3.1	2.5	5.0
South Africa, Republic of	185.5	406.7	278.2	322.4	116.1	156.0	167.4	197.9	757.5
All other countries	5,253.3	4,892.6	7,192.3	6,145.3	4,924.6	3,445.1	5,570.6	7,636.7	10,783.6

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Balance								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Weapons								
Total, all countries	1,494.3	1,856.0	1,734.9	1,583.1	1,423.5	1,693.0	1,926.7	2,050.8	1,889.6
NAFTA partners, total	117.7	215.9	145.6	183.2	174.5	154.5	170.2	192.8	116.4
Canada	109.6	211.9	142.3	176.1	163.8	143.9	154.9	154.0	105.4
Mexico	8.2	3.9	3.4	7.0	10.8	10.6	15.4	38.9	11.0
Europe Four, total	513.3	682.1	674.2	342.7	354.6	397.3	320.6	318.2	324.4
France	47.1	39.4	82.3	29.6	30.7	48.0	41.3	37.7	52.0
Germany, Federal Republic of	319.9	495.2	458.0	213.4	186.2	148.4	90.3	65.3	40.6
Italy	27.3	31.5	27.6	29.0	23.3	17.0	18.4	32.7	30.1
United Kingdom	119.0	115.9	106.3	70.7	114.4	183.8	170.6	182.5	201.7
Other Western Europe, total	136.4	156.8	196.5	156.9	123.1	123.5	196.1	141.4	138.9
Belgium	19.1	12.8	16.2	26.1	27.9	14.4	8.4	4.3	3.9
Greece	1.5	2.6	1.7	2.9	3.9	15.0	2.9	6.4	26.3
Ireland	1.2	0.9	0.8	0.8	1.2	0.8	0.8	3.4	1.7
Netherlands	31.8	41.9	67.8	70.4	36.5	35.4	78.4	73.6	70.7
Portugal	0.5	6.7	11.8	1.1	1.8	4.4	17.4	1.4	4.5
Spain	29.4	14.0	56.1	10.7	19.5	18.3	37.5	17.0	13.8
Switzerland	52.8	78.0	42.1	45.0	32.4	35.1	50.7	35.3	18.0
Nordic Countries, total	39.3	59.1	32.8	57.3	62.6	67.2	75.8	77.1	141.4
Denmark	4.1	1.7	2.1	2.9	10.2	5.5	8.9	9.5	15.5
Finland	2.8	2.9	2.0	1.2	1.4	4.1	3.1	4.3	5.8
Iceland	0.0	-2.6	0.1	0.4	0.1	0.2	0.2	0.1	0.2
Norway	13.7	61.3	29.8	45.5	32.9	45.9	42.4	49.1	92.7
Sweden	18.7	-4.1	-1.2	7.3	18.0	11.5	21.1	14.0	27.2
Central/Eastern Europe, total	2.6	6.1	9.8	5.7	5.1	20.7	6.3	48.9	9.6
Austria	2.2	4.8	6.1	2.6	2.2	1.9	1.9	44.3	6.2
Czech Republic	0.0	0.0	0.0	-0.3	0.2	0.5	0.8	0.4	0.3
Czechoslovakia	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.1	0.5	0.4	0.2	0.2	0.3	0.2	0.4	-1.3
Poland	0.4	0.7	1.7	0.4	0.7	0.7	1.9	3.0	3.6
Russia	0.0	0.0	1.1	2.5	1.7	17.3	1.0	0.5	0.5
Slovakia	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0
Slovenia	0.0	0.0	0.0	0.2	0.1	0.1	0.2	0.2	0.3
Asia, total	433.7	531.4	483.4	681.7	579.1	657.9	834.2	792.0	620.5
China	13.0	22.1	17.3	20.5	17.7	26.4	6.3	2.5	-14.0
Hong Kong	4.2	11.4	11.5	7.2	7.4	9.4	8.7	12.7	7.5
India	7.7	6.0	5.4	4.8	8.8	8.9	10.9	19.0	5.5
Indonesia	1.3	4.8	6.2	5.9	3.6	2.8	7.0	2.9	3.3
Japan	193.9	305.3	312.4	467.1	340.2	371.9	582.2	447.3	473.2
South Korea	47.9	68.7	47.2	30.3	22.2	32.1	52.5	55.5	55.9
Malaysia	4.7	2.9	2.3	3.8	2.9	8.6	9.1	9.0	3.0
Philippines	0.9	0.4	0.8	0.1	0.5	-1.1	4.8	2.9	-1.0
Singapore	36.1	36.5	22.0	26.2	27.2	30.0	38.5	33.6	31.5
Taiwan	123.1	63.6	56.6	112.9	144.9	157.1	109.5	196.8	51.2
Thailand	1.0	9.7	1.6	2.9	3.8	11.9	4.5	9.7	4.5
South America, total	12.2	15.1	14.8	10.1	11.6	19.6	15.9	21.9	28.2
Argentina	1.6	4.8	4.3	2.8	2.6	4.0	5.1	6.1	6.8
Brazil	9.7	7.4	7.0	5.1	4.7	10.5	6.1	9.6	15.4
Chile	2.2	2.5	3.4	1.5	4.1	2.6	2.2	2.4	4.6
Peru	-1.4	0.3	0.1	0.7	0.2	2.5	2.4	3.7	1.3
Africa, total	9.2	10.8	8.6	3.4	5.9	5.8	6.8	6.1	9.1
Kenya	0.1	0.2	0.3	0.1	0.2	0.1	0.0	0.1	0.2
Nigeria	7.9	8.0	6.5	1.9	1.0	1.8	2.1	3.2	6.7
South Africa, Republic of	1.2	2.6	1.8	1.3	4.7	4.0	4.7	2.8	2.2
All other countries	229.8	178.8	169.1	142.1	106.9	246.6	300.8	452.4	501.1

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Balance								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Nuclear technology									
Total, all countries	1,067.2	1,150.0	1,249.2	1,182.8	1,295.9	974.8	975.9	1,118.8	485.9
NAFTA partners, total	26.9	37.3	42.5	27.3	54.8	4.5	19.8	1.5	37.8
Canada	24.7	27.9	23.7	21.6	45.6	0.7	1.2	-1.6	-6.0
Mexico	2.1	9.4	18.8	5.7	9.2	3.8	18.6	3.0	43.8
Europe Four, total	80.3	104.2	91.9	98.4	101.3	74.6	44.3	54.6	-41.2
France	16.8	13.7	10.7	22.2	31.2	23.3	12.1	3.8	-94.2
Germany, Federal Republic of	30.8	39.0	46.5	47.0	39.0	35.0	13.2	34.4	59.9
Italy	9.8	10.3	9.6	8.3	7.9	5.4	6.6	9.8	5.7
United Kingdom	22.9	41.2	25.1	20.8	23.2	10.9	12.4	6.6	-12.6
Other Western Europe, total	31.2	44.5	53.2	53.3	61.7	85.3	75.2	95.4	25.1
Belgium	4.0	5.0	3.8	8.7	5.3	9.5	26.7	31.2	2.1
Greece	0.2	0.5	0.5	0.6	0.4	0.7	0.4	0.3	0.4
Ireland	1.6	0.8	1.8	0.9	1.0	0.0	1.4	0.3	0.3
Netherlands	8.5	8.8	8.1	11.4	9.8	9.7	6.7	7.6	-25.6
Portugal	0.5	1.9	0.8	0.2	0.1	0.3	0.0	0.1	0.7
Spain	9.0	23.5	30.3	27.0	39.9	61.1	35.6	50.4	43.0
Switzerland	7.3	4.0	7.8	4.5	5.1	4.0	4.5	5.5	4.3
Nordic Countries, total	35.8	19.1	17.2	9.0	11.8	36.0	16.1	5.9	-10.7
Denmark	0.8	2.0	0.7	2.4	1.8	1.4	3.3	1.4	1.6
Finland	2.0	2.6	2.2	1.0	0.7	-2.9	-4.0	-0.6	-0.4
Iceland	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Norway	0.5	0.7	0.3	0.3	0.3	0.6	0.7	0.7	1.3
Sweden	32.4	13.8	14.1	5.3	9.0	36.9	16.0	4.4	-13.3
Central/Eastern Europe, total	2.7	2.9	4.4	5.7	-9.0	7.7	16.2	5.0	-385.1
Austria	1.7	2.3	2.5	2.0	3.2	3.2	1.9	3.6	5.6
Czech Republic	0.0	0.0	0.0	0.5	1.1	0.4	6.0	18.9	4.7
Czechoslovakia	0.3	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.2	0.3	0.6	0.5	0.5	0.2	0.3	0.2	0.2
Poland	0.4	0.2	0.2	1.4	0.5	0.6	1.5	0.8	0.9
Russia	0.0	0.0	0.6	0.9	-14.8	2.5	1.6	-20.8	-402.1
Slovakia	0.0	0.0	0.0	0.0	0.3	0.1	0.1	0.3	1.3
Slovenia	0.0	0.0	0.0	0.4	0.2	0.6	4.8	1.9	4.3
Asia, total	867.5	916.9	1,002.8	962.1	1,040.0	741.0	771.3	970.2	860.6
China	3.5	5.6	4.2	3.2	2.9	12.4	4.4	2.1	8.8
Hong Kong	1.1	1.3	2.1	2.5	3.7	4.2	2.7	2.3	5.6
India	2.5	1.8	2.2	2.5	1.9	2.9	3.5	1.8	0.9
Indonesia	0.7	0.8	1.7	1.2	0.6	0.9	0.7	0.4	0.1
Japan	664.8	797.1	736.1	790.1	824.2	636.0	541.6	607.6	612.5
South Korea	110.7	78.0	83.2	115.3	81.8	64.9	164.5	189.3	128.4
Malaysia	0.4	0.7	0.7	1.3	0.7	1.4	0.8	4.1	1.3
Philippines	0.1	0.3	0.4	0.6	0.2	1.8	0.5	1.8	0.4
Singapore	0.4	1.2	2.1	0.9	2.8	1.4	1.1	2.6	2.7
Taiwan	82.8	29.2	169.8	44.0	120.6	12.5	50.5	157.1	99.2
Thailand	0.4	0.9	0.4	0.5	0.8	2.5	1.0	0.9	0.7
South America, total	5.0	4.0	3.6	5.4	5.8	6.7	9.5	8.5	13.6
Argentina	0.5	0.6	0.8	2.6	1.1	1.1	1.4	2.7	3.5
Brazil	3.9	2.5	2.5	2.2	4.4	4.0	5.6	5.1	9.3
Chile	0.5	0.8	0.2	0.6	0.3	1.4	0.3	0.2	0.6
Peru	0.1	0.0	0.1	0.1	0.0	0.2	2.2	0.5	0.2
Africa, total	0.6	0.9	0.7	0.8	0.6	0.5	1.1	0.6	0.4
Kenya	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0
Nigeria	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0
South Africa, Republic of	0.6	0.8	0.5	0.7	0.6	0.5	0.7	0.5	0.4
All other countries	17.3	20.2	32.9	20.7	28.9	18.6	22.7	-22.7	-14.4

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Balance								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Software								
Total, all countries	1,194.5	1,429.2	1,784.7	2,170.3	2,591.4	2,498.1	2,029.7	2,513.9	2,580.2
NAFTA partners, total	402.0	450.3	519.7	626.9	809.8	782.5	543.9	745.4	1,028.7
Canada	386.4	429.1	484.0	573.0	709.5	730.9	487.4	663.8	876.6
Mexico	15.6	21.2	35.7	53.9	100.3	51.7	56.5	81.5	152.1
Europe Four, total	319.9	362.5	482.5	560.2	595.0	486.4	356.8	403.1	406.6
France	54.9	68.4	83.0	83.0	97.8	89.6	59.1	67.2	104.5
Germany, Federal Republic of	102.2	129.8	193.0	243.8	232.3	164.3	104.1	92.8	100.7
Italy	34.6	29.4	37.5	37.0	47.4	51.4	51.4	52.0	45.2
United Kingdom	128.2	134.9	169.0	196.3	217.5	181.0	142.2	191.2	156.2
Other Western Europe, total	83.2	122.4	158.0	153.1	173.4	136.0	108.4	120.7	179.7
Belgium	13.1	19.6	30.3	42.6	52.6	37.0	16.3	20.0	18.5
Greece	1.6	2.5	4.3	5.4	6.6	6.2	0.9	2.4	3.8
Ireland	2.1	5.2	4.1	-0.9	-1.0	27.1	19.3	20.6	27.9
Netherlands	27.5	46.2	53.5	50.1	49.8	0.6	25.3	34.7	68.0
Portugal	2.5	3.9	6.1	6.4	5.2	5.7	5.1	10.2	4.9
Spain	18.5	28.6	34.4	24.5	27.8	28.1	21.9	16.3	24.2
Switzerland	18.0	16.4	25.4	24.9	32.5	31.3	19.5	16.5	32.5
Nordic Countries, total	46.6	57.4	66.8	66.4	75.8	62.8	36.0	48.6	53.8
Denmark	6.1	18.6	18.2	17.7	18.8	13.2	8.3	11.3	11.3
Finland	5.3	4.5	5.7	6.7	8.6	9.1	-2.6	5.6	7.0
Iceland	0.2	0.5	0.4	0.5	0.4	0.3	0.4	0.4	1.5
Norway	9.3	8.9	9.4	13.2	14.9	10.9	7.2	8.3	10.3
Sweden	25.8	24.8	33.1	28.3	33.0	29.3	22.7	23.1	23.7
Central/Eastern Europe, total	10.4	21.7	36.1	45.5	63.7	37.9	20.2	20.8	1.7
Austria	6.8	9.9	11.5	13.0	13.1	7.8	7.3	5.7	7.1
Czech Republic	0.0	0.0	0.0	7.0	12.7	5.5	2.4	2.7	2.5
Czechoslovakia	0.3	4.3	6.5	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	2.5	4.2	9.7	9.3	7.3	2.7	0.8	2.5	2.4
Poland	0.8	3.3	6.0	7.3	10.5	7.2	3.5	4.2	-13.1
Russia	0.0	0.0	2.0	7.5	16.5	9.1	3.5	4.3	0.7
Slovakia	0.0	0.0	0.0	0.1	1.2	2.2	0.5	0.5	0.7
Slovenia	0.0	0.0	0.4	1.4	2.4	3.5	2.2	0.9	1.4
Asia, total	213.9	242.7	293.5	396.4	452.0	559.9	568.9	708.0	467.7
China	6.9	6.3	12.6	21.2	23.8	21.0	15.5	16.3	26.3
Hong Kong	15.1	22.9	22.0	40.7	46.9	85.0	61.0	84.4	38.5
India	4.8	4.0	5.8	4.0	4.5	25.5	22.1	13.1	40.7
Indonesia	2.3	2.1	2.0	2.5	0.7	2.9	2.3	2.4	0.3
Japan	121.4	139.1	151.5	179.4	234.8	307.7	359.5	441.2	357.7
South Korea	23.5	30.0	37.0	62.7	85.1	89.1	91.1	104.0	46.8
Malaysia	2.0	4.4	5.3	10.6	13.0	10.8	-39.3	-28.5	-78.9
Philippines	3.8	0.8	1.4	3.2	2.9	2.6	5.9	5.5	2.7
Singapore	16.8	19.2	24.5	28.0	-6.3	-36.9	20.3	52.0	39.1
Taiwan	14.4	12.2	27.7	39.2	35.7	33.4	14.7	8.1	-8.1
Thailand	2.8	1.5	3.9	4.7	10.8	18.9	15.8	9.4	2.6
South America, total	14.5	35.8	49.6	90.6	121.0	131.2	127.2	163.8	198.2
Argentina	2.0	18.1	17.7	33.7	29.7	15.4	20.1	24.3	35.1
Brazil	9.1	12.1	23.8	46.3	78.6	93.1	86.7	116.1	131.9
Chile	3.0	5.1	7.2	9.0	9.2	17.3	15.3	16.6	20.2
Peru	0.4	0.6	0.8	1.6	3.6	5.4	5.1	6.9	11.0
Africa, total	11.9	17.6	24.0	37.4	52.6	52.3	47.7	33.1	26.3
Kenya	0.0	0.1	0.1	0.6	0.3	0.5	0.3	0.2	0.5
Nigeria	0.5	1.1	0.5	0.8	1.0	0.9	0.2	0.3	0.8
South Africa, Republic of	11.3	16.5	23.4	35.9	51.4	51.0	47.2	32.6	25.1
All other countries	92.0	118.8	154.3	193.9	248.0	249.0	220.6	270.4	217.4

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Exports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
All technologies									
Total, all countries	94,727.6	101,641.5	107,091.3	108,356.6	120,743.3	138,416.5	154,909.2	179,321.8	186,552.5
NAFTA partners, total	12,639.4	13,553.5	15,448.6	15,656.5	18,911.9	21,668.9	24,543.4	28,019.3	29,471.7
Canada	10,294.7	10,976.8	12,047.9	12,231.9	14,146.5	17,522.4	18,832.5	20,255.0	20,449.8
Mexico	2,344.6	2,576.7	3,400.7	3,424.6	4,765.4	4,146.5	5,710.9	7,764.3	9,021.9
Europe Four, total	25,367.4	26,647.0	25,498.5	23,336.6	25,397.7	27,029.6	27,924.8	32,648.1	36,724.5
France	5,754.9	6,772.1	6,401.1	5,820.2	5,860.5	5,611.2	5,895.2	6,455.6	7,942.7
Germany, Federal Republic of	7,402.8	8,566.2	7,765.2	6,382.5	6,559.2	7,993.3	8,373.9	8,491.2	10,409.6
Italy	2,190.0	2,530.9	2,641.6	1,745.9	2,301.1	2,606.7	2,571.4	2,409.8	2,344.5
United Kingdom	10,019.6	8,777.8	8,690.6	9,388.0	10,676.9	10,818.5	11,084.3	15,291.5	16,027.6
Other Western Europe, total	9,571.1	10,584.7	9,500.6	8,523.0	10,190.6	11,954.6	12,794.6	14,725.7	15,358.6
Belgium	1,313.5	1,477.1	1,143.3	1,026.9	1,179.9	1,168.4	1,487.2	1,725.8	2,141.5
Greece	87.5	310.3	152.9	207.4	139.2	666.1	175.1	258.8	671.0
Ireland	1,191.5	1,199.3	1,304.7	1,197.6	1,663.2	2,060.1	1,724.3	1,986.2	2,618.6
Netherlands	4,071.9	3,897.9	3,748.2	3,899.3	4,425.6	5,320.5	5,294.0	7,488.5	6,980.1
Portugal	247.9	185.0	349.1	145.3	442.1	196.9	221.0	254.6	258.6
Spain	1,702.5	1,603.4	1,512.9	1,048.9	1,184.5	1,237.2	1,266.7	1,157.2	1,077.3
Switzerland	956.2	1,911.6	1,289.6	997.4	1,156.2	1,305.3	2,626.5	1,854.6	1,611.6
Nordic Countries, total	3,211.1	3,413.4	2,538.7	2,050.7	2,001.3	2,532.6	4,220.6	3,201.3	4,059.4
Denmark	519.7	666.2	569.0	338.4	396.4	547.1	657.1	575.6	818.0
Finland	436.4	366.9	235.9	309.3	355.2	441.0	1,528.7	746.1	961.0
Iceland	147.5	60.6	23.5	15.3	15.2	43.3	88.7	20.9	91.6
Norway	553.1	664.0	531.2	464.6	406.9	362.7	501.3	579.1	579.3
Sweden	1,554.4	1,655.6	1,179.0	923.1	827.5	1,138.6	1,444.8	1,279.7	1,609.5
Central/Eastern Europe, total	458.0	600.3	1,175.5	1,279.0	1,396.3	1,341.8	1,107.4	1,843.6	2,558.8
Austria	303.6	355.5	451.3	360.6	314.6	445.1	356.6	535.4	523.3
Czech Republic	0.0	0.0	0.0	106.3	103.0	122.5	120.4	297.4	262.6
Czechoslovakia	17.8	37.8	246.1	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	24.2	130.4	136.3	250.3	112.9	71.5	72.6	142.6	125.1
Poland	112.4	76.7	203.0	253.8	186.9	203.6	182.3	418.8	191.3
Russia	0.0	0.0	129.8	273.3	631.7	446.6	307.5	384.0	1,356.6
Slovakia	0.0	0.0	0.0	10.3	14.7	13.8	23.9	35.8	62.3
Slovenia	0.0	0.0	8.9	24.4	32.6	38.6	44.1	29.7	37.6
Asia, total	30,470.3	33,160.3	36,812.9	41,871.3	47,677.1	57,846.2	64,945.9	73,876.7	68,997.0
China	1,241.7	1,707.5	2,849.7	3,401.6	3,083.5	2,470.5	3,164.6	3,737.7	6,055.5
Hong Kong	1,901.3	2,205.8	2,531.7	2,873.5	3,217.9	4,336.1	4,595.0	4,789.6	4,434.1
India	278.0	215.5	212.9	712.9	494.3	558.7	914.2	815.4	978.2
Indonesia	529.6	247.0	660.0	946.3	592.5	415.1	686.9	1,077.8	466.2
Japan	12,218.5	12,365.3	12,603.7	12,150.8	14,414.4	17,416.9	20,177.0	21,310.5	19,410.5
South Korea	3,521.1	4,072.0	4,181.2	4,646.0	6,207.4	8,414.3	9,465.6	9,851.9	7,487.7
Malaysia	2,373.4	2,592.1	2,885.6	4,102.5	4,613.9	5,526.1	4,933.2	6,869.8	6,322.0
Philippines	922.5	762.5	917.5	1,427.7	1,614.2	2,304.4	2,981.3	4,022.5	4,119.8
Singapore	3,331.1	3,779.0	3,823.1	5,216.5	6,318.0	7,619.2	8,451.7	8,949.5	8,261.6
Taiwan	2,862.9	3,522.8	4,323.2	5,128.8	5,458.1	6,357.2	6,881.8	9,267.9	9,043.4
Thailand	1,290.2	1,690.8	1,824.2	1,264.6	1,663.1	2,427.7	2,694.7	3,184.0	2,418.0
South America, total	2,180.7	2,837.4	3,116.2	2,865.4	3,233.2	4,101.2	5,067.3	6,689.8	7,277.4
Argentina	294.8	411.9	793.0	868.7	1,062.6	823.0	850.9	1,234.3	1,398.6
Brazil	1,523.3	2,055.9	1,817.2	1,604.0	1,698.2	2,564.4	3,284.6	4,333.6	4,511.5
Chile	293.4	307.1	433.7	307.5	345.3	508.1	730.0	783.7	1,033.3
Peru	69.3	62.5	72.3	85.1	127.0	205.7	201.8	338.3	334.0
Africa, total	492.3	718.7	591.1	692.5	485.2	584.3	582.0	725.0	1,334.4
Kenya	12.1	12.7	13.9	14.9	17.6	15.9	19.5	102.5	58.2
Nigeria	76.1	49.3	50.8	55.5	33.5	31.0	26.4	26.3	38.8
South Africa, Republic of	404.2	656.8	526.4	622.0	434.1	537.4	536.1	596.3	1,237.4
All other countries	10,337.2	10,126.2	12,409.2	12,081.7	11,450.0	11,357.1	13,723.1	17,592.3	20,770.7

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Exports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Biotechnology								
Total, all countries	661.2	706.0	745.8	892.7	1,029.2	1,055.5	1,197.4	1,479.6	1,469.3
NAFTA partners, total	78.7	92.1	108.2	133.7	152.6	125.3	135.2	160.8	201.0
Canada	71.2	84.2	97.4	119.3	133.3	111.1	112.1	122.8	168.4
Mexico	7.4	7.9	10.8	14.4	19.3	14.2	23.1	38.0	32.7
Europe Four, total	144.9	146.4	164.1	205.0	197.5	235.3	313.4	354.6	284.5
France	19.0	18.5	16.0	20.0	25.8	34.3	54.2	67.4	54.0
Germany, Federal Republic of	89.9	77.7	85.4	97.6	110.3	142.5	167.1	180.3	123.8
Italy	17.1	28.3	23.1	29.2	21.3	15.6	13.0	12.5	20.3
United Kingdom	18.8	21.9	39.6	58.2	40.0	42.9	79.1	94.4	86.3
Other Western Europe, total	148.6	178.6	177.8	258.3	295.4	319.3	361.0	470.5	506.4
Belgium	27.5	32.4	43.1	89.9	118.4	151.0	210.8	263.1	327.4
Greece	1.0	1.7	1.6	2.7	3.0	2.6	2.8	6.3	1.0
Ireland	48.9	79.3	60.1	81.2	94.9	83.6	48.8	104.3	24.4
Netherlands	33.0	32.0	42.5	48.6	36.9	40.4	68.5	57.9	89.6
Portugal	0.3	0.2	0.3	0.3	0.9	0.5	0.6	0.2	0.2
Spain	20.9	21.9	23.9	29.4	33.9	18.8	23.8	32.9	53.5
Switzerland	17.1	11.0	6.3	6.2	7.3	22.5	5.6	5.7	10.3
Nordic Countries, total	34.7	33.6	35.1	41.8	32.8	30.0	17.2	17.9	18.0
Denmark	3.3	4.2	4.6	2.2	3.2	6.6	9.2	4.7	3.9
Finland	17.5	17.1	16.3	25.1	20.1	14.8	2.6	2.1	2.0
Iceland	0.1	0.2	0.3	0.2	0.0	0.0	0.2	0.2	0.1
Norway	0.7	2.0	3.3	5.3	4.2	3.1	1.3	6.8	6.4
Sweden	13.1	10.1	10.6	9.0	5.2	5.4	3.9	4.1	5.6
Central/Eastern Europe, total	3.6	4.7	9.4	10.8	14.2	22.6	26.8	20.9	20.1
Austria	3.0	2.9	4.9	8.0	4.2	10.9	14.3	10.9	12.1
Czech Republic	0.0	0.0	0.0	0.0	0.9	0.4	1.0	5.2	1.6
Czechoslovakia	0.0	0.8	1.7	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.4	0.4	0.4	0.8	0.7	1.2	0.6	0.7	1.0
Poland	0.2	0.7	1.8	0.6	5.7	9.1	9.9	2.5	2.2
Russia	0.0	0.0	0.6	0.3	1.5	0.8	0.9	0.5	1.0
Slovakia	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.7
Slovenia	0.0	0.0	0.0	1.0	1.1	0.1	0.2	0.8	1.5
Asia, total	207.2	204.2	192.2	172.9	239.4	231.2	223.9	301.9	289.4
China	0.5	1.5	2.6	1.8	1.4	1.2	2.1	2.1	6.4
Hong Kong	3.8	4.1	4.4	4.1	9.6	6.6	8.0	17.0	9.4
India	0.8	0.8	1.2	0.7	1.5	1.8	3.0	3.4	5.5
Indonesia	1.5	2.4	2.1	2.6	3.4	4.1	4.2	4.5	0.7
Japan	178.5	176.6	153.8	139.6	189.5	173.0	157.8	218.9	218.9
South Korea	3.4	2.5	3.7	3.4	5.7	11.9	13.1	12.1	12.6
Malaysia	1.2	1.1	1.9	2.5	2.7	3.0	2.6	4.2	3.1
Philippines	1.4	1.5	1.7	1.9	2.8	2.8	3.6	4.4	4.0
Singapore	1.6	2.0	2.0	1.9	3.2	3.6	3.9	3.4	4.1
Taiwan	6.7	7.6	14.0	9.9	14.1	17.0	19.1	23.7	17.9
Thailand	7.8	4.0	4.8	4.6	5.5	6.1	6.5	8.1	6.9
South America, total	6.9	9.0	14.5	19.2	36.0	25.5	35.4	48.9	47.0
Argentina	2.3	4.8	8.8	10.1	14.5	7.1	8.5	13.9	15.4
Brazil	1.7	1.4	2.5	4.5	15.7	12.9	22.4	26.1	21.8
Chile	1.3	1.1	1.3	2.5	2.8	2.0	1.6	5.4	6.2
Peru	1.7	1.7	1.8	2.1	2.9	3.6	2.9	3.6	3.5
Africa, total	3.3	3.1	2.6	3.5	3.7	4.2	4.9	5.0	4.3
Kenya	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.2	0.0
Nigeria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
South Africa, Republic of	3.3	3.0	2.6	3.4	3.6	4.1	4.8	4.7	4.1
All other countries	33.3	34.3	41.9	47.6	57.6	62.1	79.7	99.1	98.6

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Exports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Life science technologies									
Total, all countries	5,049.1	5,344.3	5,781.1	6,021.6	6,798.5	8,568.3	9,190.3	10,155.9	10,173.4
NAFTA partners, total	727.3	688.6	721.2	763.4	880.3	906.2	950.4	1,027.5	1,017.7
Canada	581.3	509.0	510.5	521.3	632.9	732.2	764.8	788.0	754.1
Mexico	146.0	179.7	210.7	242.2	247.4	174.0	185.6	239.5	263.5
Europe Four, total	1,493.3	1,637.6	1,804.7	1,688.2	1,890.6	2,392.8	2,417.4	2,552.4	2,627.4
France	285.1	314.9	386.5	343.6	418.1	495.3	535.6	513.6	540.4
Germany, Federal Republic of	653.0	773.3	807.9	825.0	896.0	1,020.9	1,076.2	1,137.0	1,105.3
Italy	221.1	227.2	250.9	179.5	173.0	270.1	247.3	279.4	355.9
United Kingdom	334.0	322.2	359.4	340.1	403.5	606.5	558.3	622.4	625.7
Other Western Europe, total	616.1	702.2	747.0	758.7	837.8	1,075.5	1,146.1	1,391.0	1,770.6
Belgium	103.5	156.2	173.4	200.4	248.4	253.0	250.6	281.0	376.8
Greece	11.0	18.8	19.1	21.5	16.8	29.5	23.4	28.6	31.8
Ireland	62.7	48.5	52.8	60.0	62.3	84.1	85.9	79.8	165.9
Netherlands	255.4	279.1	287.5	273.8	303.4	394.7	466.3	641.1	812.6
Portugal	9.9	12.7	15.8	13.2	15.7	36.7	34.3	29.1	40.0
Spain	81.2	90.9	90.7	87.5	87.8	120.1	135.4	148.8	174.1
Switzerland	92.4	95.9	107.8	102.4	103.3	157.5	150.3	182.5	169.5
Nordic Countries, total	161.5	159.8	156.6	149.6	159.6	186.9	214.2	252.5	328.9
Denmark	18.9	19.2	22.6	29.8	26.5	39.8	38.8	41.7	45.1
Finland	29.0	24.6	16.6	14.9	19.2	22.1	27.8	28.2	42.7
Iceland	0.9	1.6	0.8	2.0	0.8	2.2	1.1	1.3	2.1
Norway	27.9	22.4	18.8	22.4	18.5	25.8	31.6	26.2	33.9
Sweden	84.8	92.0	97.8	80.5	94.6	96.9	114.9	155.0	205.1
Central/Eastern Europe, total	56.6	56.5	86.0	106.1	140.2	161.3	171.0	176.9	156.8
Austria	38.6	34.8	46.4	45.8	53.6	62.3	60.4	57.9	57.6
Czech Republic	0.0	0.0	0.0	7.0	10.0	11.5	11.3	12.4	13.4
Czechoslovakia	5.7	4.5	7.8	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	5.1	9.3	6.9	7.2	12.4	7.9	7.9	10.2	9.8
Poland	7.3	7.8	11.7	10.6	17.2	19.6	21.3	20.8	23.7
Russia	0.0	0.0	12.7	31.5	43.4	54.5	63.8	68.5	47.9
Slovakia	0.0	0.0	0.0	0.7	1.2	1.3	3.3	3.1	2.1
Slovenia	0.0	0.0	0.4	3.4	2.4	4.3	3.0	4.0	2.4
Asia, total	1,336.7	1,331.3	1,494.8	1,690.9	1,946.1	2,698.7	3,028.0	3,347.1	2,739.8
China	87.7	93.4	134.2	152.7	125.8	142.5	167.5	188.5	197.0
Hong Kong	50.8	70.4	91.4	113.7	121.4	149.8	174.5	210.6	223.4
India	62.2	39.2	42.0	49.5	53.3	73.1	81.7	113.0	92.0
Indonesia	9.5	12.6	9.0	15.3	7.4	14.0	12.9	21.0	9.0
Japan	751.7	730.6	788.5	850.0	1,005.0	1,560.6	1,729.0	1,911.9	1,602.8
South Korea	168.4	198.8	184.7	229.4	314.7	350.4	406.0	386.0	208.5
Malaysia	9.9	14.1	16.5	23.5	25.8	42.2	37.9	70.2	54.5
Philippines	9.3	8.7	9.5	12.9	13.9	17.1	20.9	32.0	19.1
Singapore	63.1	45.4	55.5	72.2	104.3	137.2	141.8	159.9	110.7
Taiwan	102.0	89.8	124.9	125.1	124.2	138.9	173.8	183.2	190.4
Thailand	22.1	28.3	38.7	46.5	50.1	73.0	82.1	70.8	32.6
South America, total	137.7	177.0	206.5	241.2	288.9	361.4	410.3	445.5	495.4
Argentina	21.6	39.1	52.1	57.3	99.8	76.6	82.1	89.9	92.5
Brazil	94.0	112.2	114.0	133.4	141.6	229.6	265.8	289.2	341.2
Chile	15.1	21.4	33.5	41.3	36.3	37.2	44.3	44.4	45.0
Peru	7.0	4.4	6.9	9.3	11.2	18.0	18.1	22.1	16.7
Africa, total	43.1	45.8	45.9	42.2	42.2	58.2	61.0	61.3	62.7
Kenya	0.7	0.5	1.3	0.5	0.5	0.7	1.4	0.9	1.3
Nigeria	12.2	10.5	11.2	3.6	2.2	4.0	4.1	2.1	4.0
South Africa, Republic of	30.2	34.8	33.5	38.1	39.5	53.6	55.4	58.3	57.4
All other countries	476.8	545.6	518.4	581.2	612.9	727.3	791.9	901.7	974.2

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Exports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Opto-electronics								
Total, all countries	548.6	655.6	639.6	720.6	946.5	1,201.6	1,448.0	1,826.4	1,944.3
NAFTA partners, total	68.2	76.0	109.6	127.0	162.1	177.6	211.2	293.5	296.0
Canada	50.5	47.5	73.8	83.8	104.7	132.7	151.2	226.6	230.6
Mexico	17.8	28.5	35.8	43.2	57.4	44.8	60.0	67.0	65.5
Europe Four, total	188.8	210.8	220.6	229.4	285.7	349.5	348.7	422.9	554.8
France	32.9	34.1	31.0	30.5	39.0	46.2	55.1	79.9	83.4
Germany, Federal Republic of	60.1	90.6	110.2	107.3	149.2	193.0	166.8	174.6	190.0
Italy	25.0	23.5	22.2	19.7	20.5	24.1	20.9	35.2	52.7
United Kingdom	70.8	62.7	57.3	71.8	77.0	86.2	105.9	133.2	228.8
Other Western Europe, total	40.4	56.1	64.9	58.1	44.9	85.9	87.3	109.1	123.1
Belgium	3.8	4.3	9.5	4.6	7.4	13.8	16.4	13.5	24.0
Greece	0.4	0.6	1.1	0.4	0.4	0.9	1.3	0.9	1.8
Ireland	1.5	6.4	5.1	15.3	6.4	8.8	7.1	16.5	10.4
Netherlands	18.5	21.9	19.9	22.0	14.2	35.8	32.6	44.0	53.9
Portugal	0.5	1.7	0.9	1.6	1.3	1.6	1.5	2.3	1.6
Spain	7.1	8.7	20.0	6.7	7.3	15.8	17.8	18.9	13.4
Switzerland	8.7	12.5	8.4	7.4	8.1	9.1	10.7	13.0	18.1
Nordic Countries, total	19.2	13.3	14.0	18.5	26.6	22.6	31.7	27.3	42.4
Denmark	4.2	2.2	2.8	3.5	4.4	3.3	4.9	4.2	5.2
Finland	5.2	3.1	3.1	3.0	3.2	3.4	4.6	6.9	8.0
Iceland	0.0	0.1	0.0	0.9	0.1	0.1	0.1	0.2	0.5
Norway	2.4	1.6	2.1	5.1	7.3	5.9	5.0	2.7	4.2
Sweden	7.4	6.3	5.9	6.0	11.6	9.9	17.1	13.3	24.6
Central/Eastern Europe, total	3.5	5.1	5.8	5.2	9.0	11.1	8.8	13.8	15.1
Austria	3.0	3.9	5.1	3.8	4.9	6.5	5.3	9.1	7.1
Czech Republic	0.0	0.0	0.0	0.1	0.5	0.9	0.6	0.8	1.4
Czechoslovakia	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.2	0.6	0.2	0.4	0.5	0.5	0.7	0.6	1.1
Poland	0.1	0.6	0.0	0.3	0.3	1.0	0.6	1.1	2.7
Russia	0.0	0.0	0.2	0.4	2.2	1.4	0.6	1.4	1.4
Slovakia	0.0	0.0	0.0	0.1	0.0	0.1	0.4	0.1	0.2
Slovenia	0.0	0.0	0.1	0.1	0.6	0.6	0.7	0.8	1.2
Asia, total	162.5	215.9	142.1	179.0	317.7	444.8	650.9	803.4	745.7
China	3.6	4.0	8.7	7.7	5.5	7.4	10.2	13.1	44.6
Hong Kong	7.5	11.4	14.3	18.0	17.9	16.5	18.4	27.5	41.4
India	1.9	1.0	2.1	2.8	6.9	12.7	7.5	4.7	9.5
Indonesia	0.4	0.4	1.5	1.2	1.0	2.0	8.9	2.3	1.0
Japan	111.7	142.2	57.9	78.5	163.6	181.6	319.6	330.9	296.7
South Korea	10.9	23.7	28.5	28.7	48.4	69.9	75.4	89.7	39.1
Malaysia	3.7	3.4	2.7	4.8	5.7	14.1	13.2	29.2	26.5
Philippines	2.4	0.7	0.6	1.3	0.9	3.5	5.9	24.7	16.8
Singapore	7.0	9.8	13.8	22.6	38.6	74.1	85.7	122.3	94.9
Taiwan	11.9	16.8	10.4	11.7	26.4	56.0	95.4	149.3	168.4
Thailand	1.5	2.5	1.5	1.7	2.8	7.0	10.8	9.7	6.7
South America, total	8.8	6.8	9.5	15.1	20.6	29.8	35.5	51.0	43.0
Argentina	1.3	2.3	4.4	6.0	6.9	6.7	6.5	8.7	7.1
Brazil	6.1	3.1	3.2	6.3	9.7	18.1	22.2	34.2	30.2
Chile	0.8	1.3	1.3	2.4	3.3	4.2	3.9	4.5	3.8
Peru	0.6	0.2	0.6	0.4	0.8	0.8	2.8	3.5	1.9
Africa, total	3.1	6.0	4.1	4.2	7.5	7.2	5.9	8.8	14.6
Kenya	0.4	0.2	0.2	0.2	0.1	0.2	0.2	0.7	0.3
Nigeria	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.2
South Africa, Republic of	2.7	5.8	3.9	4.1	7.2	7.0	5.5	8.1	14.1
All other countries	54.0	65.5	69.1	84.0	72.2	73.1	68.0	96.7	109.6

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Exports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Computers and telecommunications									
Total, all countries	31,375.0	30,726.3	32,569.2	34,198.8	39,859.3	47,890.5	52,780.1	61,164.6	58,201.8
NAFTA partners, total	5,510.0	5,607.2	6,393.6	7,032.7	8,197.7	8,883.0	10,716.7	12,686.6	13,161.3
Canada	4,353.9	4,433.6	4,958.8	5,333.4	5,975.3	7,064.3	8,071.2	9,050.3	8,897.2
Mexico	1,156.1	1,173.7	1,434.8	1,699.3	2,222.4	1,818.7	2,645.6	3,636.3	4,264.2
Europe Four, total	8,694.5	7,882.8	7,780.3	7,454.3	8,591.6	10,331.8	10,683.0	11,066.1	10,604.7
France	1,490.7	1,353.6	1,377.7	1,305.9	1,598.7	2,084.5	2,186.9	1,982.0	1,720.5
Germany, Federal Republic of	2,909.1	2,712.0	2,677.9	2,402.3	2,554.9	3,242.0	3,511.4	3,093.2	3,124.7
Italy	803.4	774.0	685.8	566.0	584.6	662.5	704.3	720.8	639.7
United Kingdom	3,491.3	3,043.2	3,038.9	3,180.0	3,853.4	4,342.7	4,280.4	5,270.1	5,119.8
Other Western Europe, total	3,855.0	3,706.1	3,827.5	3,830.3	4,142.0	4,915.9	5,016.8	6,606.9	7,229.8
Belgium	455.6	437.4	446.1	370.9	351.3	364.6	426.0	482.7	570.8
Greece	24.3	36.6	41.7	49.5	32.4	47.6	41.3	40.3	73.5
Ireland	624.1	546.1	576.4	528.5	878.4	1,184.2	999.9	1,152.1	1,541.9
Netherlands	1,923.9	1,806.2	1,852.0	2,057.1	1,968.3	2,141.6	2,387.4	3,992.8	4,084.6
Portugal	66.5	72.3	59.6	48.5	73.4	71.3	69.1	102.1	80.8
Spain	339.9	402.0	436.9	370.9	408.1	583.1	573.9	404.4	403.0
Switzerland	420.6	405.5	414.8	404.9	430.2	523.5	519.3	432.6	475.2
Nordic Countries, total	776.8	755.4	773.4	675.8	655.3	881.9	961.2	907.2	822.8
Denmark	137.0	145.6	153.0	146.3	144.8	202.1	218.7	196.6	164.9
Finland	117.1	92.6	82.6	85.8	86.5	140.3	160.0	160.4	188.1
Iceland	3.4	15.7	16.0	5.3	8.6	36.4	23.3	14.1	16.4
Norway	136.9	124.1	151.8	137.1	127.0	133.0	151.2	206.9	124.5
Sweden	382.4	377.4	369.9	301.2	288.4	370.1	407.9	329.1	328.8
Central/Eastern Europe, total	162.7	249.9	381.2	522.2	483.1	546.2	543.5	660.1	899.1
Austria	129.6	158.8	135.8	131.3	141.7	152.4	150.6	140.4	138.3
Czech Republic	0.0	0.0	0.0	64.4	52.8	76.1	74.7	63.3	80.1
Czechoslovakia	8.5	23.0	70.0	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	11.3	17.3	29.1	66.5	46.5	44.7	45.7	116.2	96.0
Poland	13.3	50.9	53.4	63.1	57.5	65.2	69.4	92.8	112.9
Russia	0.0	0.0	86.4	177.5	160.1	180.8	170.5	216.9	396.6
Slovakia	0.0	0.0	0.0	4.9	8.2	9.0	13.3	15.2	53.7
Slovenia	0.0	0.0	6.4	14.6	16.3	18.0	19.3	15.3	21.5
Asia, total	8,307.7	8,206.8	8,768.1	9,222.1	11,262.3	14,849.6	16,890.1	18,707.4	15,146.4
China	232.5	229.3	398.9	664.7	685.1	851.4	770.5	791.7	1,453.2
Hong Kong	452.2	514.0	691.2	854.8	1,035.9	1,674.5	1,551.4	2,196.1	1,749.1
India	89.3	83.2	83.1	88.5	129.4	211.5	254.3	238.6	257.5
Indonesia	88.8	83.6	162.3	101.9	73.3	183.6	274.3	407.6	75.1
Japan	4,232.5	4,202.1	4,095.5	3,917.7	4,542.7	5,559.5	6,784.4	6,863.1	5,494.7
South Korea	827.0	829.9	754.6	894.2	1,482.6	1,768.0	2,055.6	2,102.0	1,089.0
Malaysia	165.3	217.8	252.2	261.3	436.9	715.2	791.6	1,050.7	831.1
Philippines	83.2	92.6	124.6	137.4	213.8	272.3	316.0	399.6	299.2
Singapore	1,106.5	1,008.2	1,017.0	1,195.6	1,477.1	2,245.8	2,601.5	2,729.2	2,252.3
Taiwan	859.6	698.6	866.3	813.2	767.4	800.8	975.1	1,370.5	1,302.6
Thailand	170.8	247.5	322.3	292.8	418.1	567.0	515.4	558.4	342.6
South America, total	621.6	783.4	1,146.7	1,390.1	2,078.9	2,252.2	2,857.1	3,819.6	3,708.4
Argentina	150.7	260.1	386.0	493.9	742.9	499.7	619.3	883.2	901.3
Brazil	349.7	374.0	557.7	662.9	1,027.1	1,377.2	1,808.0	2,279.2	2,093.8
Chile	90.1	117.3	156.1	178.1	214.4	252.0	284.2	398.1	464.5
Peru	31.1	32.1	46.9	55.3	94.5	123.4	145.7	259.1	248.8
Africa, total	159.8	169.3	180.6	224.6	191.1	233.4	216.3	267.8	350.6
Kenya	4.6	4.8	3.1	3.9	5.7	6.9	4.8	6.7	8.2
Nigeria	15.1	16.5	25.1	40.7	11.9	16.4	13.5	16.3	20.4
South Africa, Republic of	140.1	147.9	152.4	179.9	173.5	210.1	198.1	244.8	322.0
All other countries	3,286.9	3,365.4	3,317.8	3,846.9	4,257.2	4,996.3	4,895.2	6,442.9	6,278.7

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Exports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Electronics								
Total, all countries	7,392.3	8,709.3	9,753.0	11,814.5	16,098.6	31,223.4	35,079.5	37,946.2	38,155.6
NAFTA partners, total	1,699.2	2,240.7	2,579.2	2,832.8	4,127.6	6,770.1	7,404.8	8,107.8	8,341.6
Canada	1,400.6	1,976.1	2,239.7	2,387.6	3,228.9	5,518.5	5,279.6	5,238.2	5,340.8
Mexico	298.6	264.6	339.4	445.1	898.7	1,251.6	2,125.2	2,869.6	3,000.8
Europe Four, total	1,705.3	1,884.5	1,979.8	2,452.8	3,064.9	4,056.8	3,484.4	3,636.7	3,567.7
France	357.7	336.2	276.9	290.3	318.4	521.8	457.5	595.7	720.1
Germany, Federal Republic of	445.8	487.9	440.9	523.8	631.9	871.8	801.7	730.3	855.2
Italy	181.4	225.8	187.0	186.5	237.9	328.1	418.5	533.9	471.2
United Kingdom	720.4	834.5	1,075.0	1,452.3	1,876.7	2,335.0	1,806.8	1,776.8	1,521.2
Other Western Europe, total	367.2	388.3	379.9	444.8	660.0	886.8	1,147.4	1,444.6	1,095.5
Belgium	38.6	32.6	30.3	42.9	58.0	64.4	45.1	65.7	61.0
Greece	0.5	1.6	5.4	1.3	1.1	2.1	2.6	1.9	2.7
Ireland	99.4	93.0	105.9	162.2	273.6	380.7	273.4	247.3	335.9
Netherlands	141.8	160.8	126.1	146.9	213.2	274.3	659.4	925.4	501.4
Portugal	11.1	10.4	11.4	6.1	8.4	18.0	33.2	45.3	42.3
Spain	28.6	38.7	42.4	36.1	41.1	54.7	58.0	59.9	68.5
Switzerland	47.1	51.3	58.4	49.3	64.8	92.5	75.7	99.1	83.6
Nordic Countries, total	72.6	92.3	118.1	162.2	239.0	300.3	345.4	401.8	373.0
Denmark	13.6	15.3	16.3	24.3	40.2	51.4	49.1	53.9	48.8
Finland	14.0	14.0	19.9	30.1	47.3	56.6	58.6	59.1	86.0
Iceland	0.1	0.2	0.2	0.4	0.5	0.8	0.7	1.5	1.1
Norway	11.3	17.4	20.2	22.6	31.9	34.8	32.8	33.2	41.5
Sweden	33.6	45.5	61.5	84.8	119.0	156.7	204.2	254.2	195.7
Central/Eastern Europe, total	15.3	22.4	23.0	35.7	58.4	74.4	77.0	70.9	65.4
Austria	13.9	18.8	14.6	21.7	35.9	43.8	44.5	41.0	26.3
Czech Republic	0.0	0.0	0.0	2.3	4.1	8.3	7.6	6.0	12.4
Czechoslovakia	0.2	0.9	3.6	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.5	1.0	0.7	2.8	2.8	2.8	4.2	3.5	2.0
Poland	0.8	1.6	1.9	2.7	5.1	5.7	5.2	5.8	11.0
Russia	0.0	0.0	2.0	5.3	8.6	11.8	9.8	11.6	12.7
Slovakia	0.0	0.0	0.0	0.2	0.6	0.5	0.6	0.9	0.3
Slovenia	0.0	0.0	0.3	0.8	1.4	1.5	5.0	2.0	0.7
Asia, total	3,183.1	3,726.9	4,334.2	5,443.3	7,355.3	18,280.3	21,609.4	23,405.7	23,684.4
China	20.8	17.2	21.7	33.1	25.1	73.6	160.2	190.6	509.6
Hong Kong	424.6	464.9	669.5	795.6	892.2	1,536.5	1,821.2	1,804.8	1,660.8
India	44.0	28.8	27.8	26.4	35.2	75.8	57.1	47.9	52.4
Indonesia	1.2	6.4	1.9	1.6	3.6	25.5	130.1	106.4	80.9
Japan	921.1	1,099.9	1,048.3	1,254.0	1,817.8	3,454.3	4,216.8	3,907.9	3,216.2
South Korea	225.5	277.4	286.9	452.4	555.8	2,066.3	2,653.8	3,141.2	3,531.5
Malaysia	363.8	302.3	327.3	317.6	426.9	3,731.7	3,285.5	3,668.2	3,783.4
Philippines	76.8	87.5	94.4	125.2	134.8	1,476.3	2,104.5	2,958.0	3,504.8
Singapore	553.7	617.2	809.3	1,315.3	1,901.2	2,890.3	3,415.8	3,306.3	3,124.4
Taiwan	516.3	780.4	998.5	1,058.2	1,463.0	2,297.6	2,941.9	3,213.0	3,079.7
Thailand	35.3	45.0	48.6	64.1	99.7	652.5	822.5	1,061.5	1,140.8
South America, total	127.1	126.7	110.3	118.1	158.6	231.6	290.1	366.1	387.0
Argentina	10.0	14.1	26.7	18.0	22.8	14.5	11.6	28.8	22.5
Brazil	112.6	108.3	77.5	92.3	123.8	199.2	261.7	317.6	347.6
Chile	4.0	3.7	5.3	6.8	9.6	14.4	12.7	11.8	12.8
Peru	0.5	0.6	0.8	1.1	2.5	3.5	4.2	7.9	4.1
Africa, total	16.4	21.5	15.1	22.3	23.6	31.0	22.7	19.3	19.3
Kenya	0.0	0.1	0.1	0.1	0.7	0.0	0.6	2.1	0.5
Nigeria	0.8	0.6	0.3	1.8	0.8	0.8	0.2	0.4	0.1
South Africa, Republic of	15.6	20.8	14.8	20.3	22.1	30.2	21.9	16.8	18.7
All other countries	206.0	206.0	213.4	302.4	411.2	592.1	698.3	493.3	621.6

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Exports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Computer-integrated manufacturing								
Total, all countries	3,095.7	3,251.4	3,412.6	4,039.0	5,191.0	7,469.6	8,583.6	9,126.5	7,295.2
NAFTA partners, total	540.2	542.5	617.7	618.6	793.9	835.2	905.3	1,210.8	1,148.1
Canada	408.8	383.1	380.8	412.3	580.1	650.0	664.5	858.4	774.8
Mexico	131.3	159.3	236.9	206.3	213.8	185.3	240.7	352.4	373.3
Europe Four, total	719.7	701.0	726.5	808.5	941.1	1,320.3	1,349.2	1,203.7	1,070.6
France	139.0	164.6	177.6	221.8	269.6	316.7	380.7	332.8	228.8
Germany, Federal Republic of	265.1	267.8	225.3	237.7	254.6	500.8	428.9	344.0	370.5
Italy	110.5	97.6	121.2	112.6	146.1	190.1	158.8	116.3	139.7
United Kingdom	205.1	171.1	202.4	236.4	270.8	312.6	380.8	410.7	331.6
Other Western Europe, total	209.1	209.9	234.1	289.2	312.2	463.3	456.6	488.7	623.8
Belgium	33.8	26.2	34.4	20.0	32.5	41.7	49.3	45.1	49.5
Greece	2.3	2.6	4.2	3.7	1.3	2.8	4.0	3.1	3.4
Ireland	12.7	14.6	27.7	95.5	82.9	77.3	55.5	111.2	211.6
Netherlands	80.1	69.1	85.2	88.8	107.8	222.7	189.7	174.6	227.3
Portugal	4.6	5.7	6.8	6.3	7.4	5.3	7.5	2.7	4.2
Spain	30.2	34.3	35.3	28.6	29.3	35.4	45.5	57.4	25.7
Switzerland	45.4	57.4	40.4	46.2	51.0	78.0	105.2	94.7	102.3
Nordic Countries, total	39.9	43.2	43.2	51.6	59.0	73.9	82.6	86.4	78.2
Denmark	7.6	7.8	6.6	7.0	8.9	10.7	17.7	11.3	10.0
Finland	7.5	6.4	7.4	5.9	10.2	18.8	20.7	22.7	13.6
Iceland	0.3	0.6	0.6	0.9	0.7	0.5	0.9	1.2	0.4
Norway	6.1	8.1	11.2	14.0	8.2	12.2	10.0	15.5	11.9
Sweden	18.4	20.3	17.4	23.7	31.0	31.7	33.3	35.7	42.3
Central/Eastern Europe, total	17.5	16.0	28.3	56.1	84.9	71.8	74.9	64.3	65.2
Austria	12.4	12.1	20.9	25.4	29.8	35.7	35.6	25.4	12.4
Czech Republic	0.0	0.0	0.0	2.8	2.9	7.7	5.5	4.0	14.4
Czechoslovakia	2.2	0.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.8	1.4	0.7	1.7	4.9	5.6	2.3	2.6	6.7
Poland	2.2	1.9	2.5	2.4	2.4	1.7	3.2	6.5	6.5
Russia	0.0	0.0	2.6	20.5	38.0	14.1	22.5	22.8	23.2
Slovakia	0.0	0.0	0.0	2.5	2.5	0.4	0.3	0.4	1.6
Slovenia	0.0	0.0	0.4	0.7	4.5	6.6	5.5	2.6	0.4
Asia, total	1,276.0	1,465.2	1,427.4	1,838.4	2,615.3	4,229.6	5,210.6	5,430.3	3,703.8
China	60.8	89.0	107.1	156.3	174.1	152.7	200.4	167.4	187.7
Hong Kong	35.8	42.7	60.6	87.6	107.3	109.9	132.9	142.6	95.9
India	35.6	18.1	17.4	30.0	39.0	32.9	58.4	29.3	28.8
Indonesia	4.3	5.4	11.7	9.8	8.1	14.9	16.2	15.1	8.0
Japan	593.1	661.4	478.2	544.9	819.1	1,291.5	1,608.5	1,425.3	1,032.2
South Korea	208.0	289.0	294.5	382.0	709.9	1,324.3	1,559.4	1,175.0	476.4
Malaysia	57.4	54.9	75.6	113.9	117.8	189.2	196.9	295.8	216.3
Philippines	40.9	37.3	30.4	54.1	47.7	105.3	89.5	168.9	202.1
Singapore	100.5	94.1	127.2	170.2	172.1	313.8	402.2	488.8	345.6
Taiwan	115.5	147.4	194.1	254.3	367.8	630.4	866.5	1,456.8	1,061.1
Thailand	24.2	25.9	30.6	35.3	52.3	64.7	79.7	65.4	49.6
South America, total	46.6	46.9	43.2	69.0	78.1	108.1	126.5	218.7	184.9
Argentina	4.6	8.7	11.2	17.1	27.4	20.5	22.0	26.0	25.8
Brazil	33.0	29.1	23.3	37.1	34.3	66.5	79.5	162.6	127.4
Chile	7.5	6.8	7.3	12.0	12.7	15.7	17.6	22.6	24.1
Peru	1.4	2.3	1.4	2.9	3.6	5.4	7.4	7.5	7.7
Africa, total	13.2	18.8	14.5	13.4	14.3	16.2	27.5	27.3	23.3
Kenya	0.2	0.8	0.5	0.2	0.8	0.5	0.7	0.6	0.2
Nigeria	0.7	1.6	1.9	1.1	2.3	2.2	2.8	1.2	1.4
South Africa, Republic of	12.2	16.4	12.2	12.1	11.2	13.5	24.0	25.6	21.7
All other countries	233.5	208.1	277.8	294.4	292.4	351.2	350.6	396.2	397.3

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Exports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Material design								
Total, all countries	6,403.0	6,226.1	7,153.6	8,404.2	10,406.2	4,519.5	3,013.4	3,320.7	1,290.2
NAFTA partners, total	976.6	975.3	1,236.3	1,153.1	1,291.3	641.5	521.8	533.0	296.0
Canada	800.0	777.2	989.0	904.8	933.4	192.7	351.4	381.7	240.0
Mexico	176.6	198.1	247.3	248.3	357.9	448.8	170.3	151.3	55.9
Europe Four, total	303.9	302.0	346.8	335.6	387.9	303.5	334.3	328.8	167.9
France	69.7	82.4	63.3	102.0	117.1	62.4	73.0	94.0	57.5
Germany, Federal Republic of	75.6	52.9	94.7	59.6	65.8	68.3	80.6	75.8	48.3
Italy	46.5	53.8	75.3	38.9	50.4	26.9	27.3	20.6	16.4
United Kingdom	112.1	112.9	113.5	135.1	154.6	145.9	153.3	138.5	45.6
Other Western Europe, total	91.0	86.8	88.7	99.3	114.3	99.4	114.3	101.3	57.2
Belgium	2.7	1.7	2.3	2.8	3.8	4.6	5.5	6.8	6.6
Greece	0.2	0.5	0.1	0.2	0.2	0.3	1.4	1.6	0.1
Ireland	41.0	37.0	26.4	46.7	47.9	35.6	42.0	44.9	17.0
Netherlands	10.5	17.8	20.1	12.7	12.3	14.9	25.1	16.0	11.2
Portugal	18.4	19.8	21.8	20.2	16.8	12.7	2.3	0.8	0.5
Spain	15.1	6.6	10.1	7.5	24.1	21.9	23.2	20.9	17.2
Switzerland	3.1	3.4	7.9	9.2	9.1	9.3	14.8	10.2	4.6
Nordic Countries, total	10.0	10.4	19.1	17.9	20.3	28.1	44.3	36.0	13.5
Denmark	1.3	1.8	4.4	3.3	3.7	4.8	7.1	6.3	1.3
Finland	2.3	2.4	3.7	1.9	2.0	5.0	6.2	4.4	1.1
Iceland	1.2	1.8	0.7	1.2	0.4	0.7	0.4	0.1	0.1
Norway	1.1	2.0	6.4	6.7	6.1	5.4	13.1	7.2	6.8
Sweden	4.1	2.5	4.0	4.9	8.1	12.2	17.4	18.1	4.2
Central/Eastern Europe, total	1.0	1.7	10.5	20.6	15.2	19.2	36.2	29.1	18.4
Austria	0.9	1.3	5.9	7.9	3.2	8.0	9.6	7.1	7.1
Czech Republic	0.0	0.0	0.0	0.7	1.6	1.5	2.7	4.6	1.1
Czechoslovakia	0.0	0.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.1	0.1	0.1	0.2	1.4	0.6	2.1	0.4	0.1
Poland	0.0	0.1	3.5	9.1	6.6	5.2	9.9	8.0	4.0
Russia	0.0	0.0	0.1	0.4	1.7	3.6	7.0	5.9	4.6
Slovakia	0.0	0.0	0.0	1.8	0.6	0.1	4.7	3.1	1.4
Slovenia	0.0	0.0	0.1	0.5	0.1	0.1	0.2	0.1	0.1
Asia, total	4,952.6	4,798.7	5,363.6	6,654.6	8,461.2	3,320.1	1,795.4	2,074.6	600.5
China	8.4	4.2	21.1	25.7	44.4	71.0	100.7	153.9	34.2
Hong Kong	339.0	307.4	304.4	387.4	562.0	304.4	99.5	88.6	101.4
India	1.9	1.5	3.2	2.3	4.3	4.3	14.9	5.4	3.1
Indonesia	12.2	6.5	14.4	29.1	37.3	54.1	5.5	4.5	0.2
Japan	437.1	498.4	574.1	736.7	761.2	614.5	529.3	519.4	301.8
South Korea	773.5	630.1	787.4	872.1	1,148.7	315.6	129.8	141.1	32.7
Malaysia	1,326.0	1,329.1	1,382.1	1,854.9	2,603.1	534.0	257.9	297.1	13.0
Philippines	505.9	491.8	591.6	694.5	1,142.1	230.2	145.3	301.8	2.2
Singapore	660.5	690.1	814.7	953.6	766.4	427.2	207.4	167.1	60.6
Taiwan	405.3	389.0	507.0	589.5	701.1	400.8	139.3	180.3	47.0
Thailand	482.8	450.7	363.7	508.6	690.7	364.0	165.7	215.4	4.4
South America, total	15.3	9.7	24.9	39.6	35.9	28.7	55.7	95.7	53.5
Argentina	2.0	1.9	6.6	17.2	8.3	5.4	6.3	8.2	7.1
Brazil	12.9	7.2	13.2	17.0	21.5	19.2	43.0	81.6	42.6
Chile	0.3	0.5	4.7	5.4	4.9	3.2	5.2	5.1	3.3
Peru	0.2	0.2	0.3	0.1	1.1	0.9	1.2	0.8	0.5
Africa, total	1.3	1.3	1.8	2.4	3.1	3.6	4.9	3.2	11.2
Kenya	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Nigeria	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0
South Africa, Republic of	1.2	1.3	1.8	2.3	3.1	3.6	4.7	3.1	11.2
All other countries	51.2	40.1	61.9	81.2	77.0	75.4	106.5	119.1	72.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Exports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Aerospace									
Total, all countries	36,155.0	41,220.4	41,810.6	36,796.4	34,500.1	30,517.5	37,746.6	47,677.6	61,269.2
NAFTA partners, total	2,404.7	2,521.6	2,822.8	2,024.1	2,138.9	2,231.0	2,757.5	2,903.8	3,627.6
Canada	2,022.6	2,001.3	2,014.1	1,578.2	1,515.7	2,091.0	2,594.6	2,642.7	2,902.9
Mexico	382.1	520.3	808.7	445.9	623.2	140.0	162.9	261.1	724.7
Europe Four, total	11,112.0	12,618.4	11,104.9	9,000.7	8,844.4	6,878.9	8,013.3	12,071.7	16,699.7
France	3,232.3	4,327.7	3,861.0	3,355.8	2,900.0	1,869.0	2,017.5	2,659.4	4,343.8
Germany, Federal Republic of	2,422.1	3,407.7	2,596.1	1,595.8	1,399.5	1,528.4	1,792.2	2,443.1	4,223.0
Italy	708.3	1,028.1	1,199.5	536.8	984.8	1,005.9	896.6	592.0	563.8
United Kingdom	4,749.3	3,854.8	3,448.2	3,512.2	3,560.2	2,475.6	3,307.1	6,377.2	7,569.1
Other Western Europe, total	3,968.1	4,902.2	3,529.8	2,345.2	3,336.3	3,635.3	3,985.0	3,657.5	3,486.5
Belgium	609.0	745.8	352.5	214.2	270.8	206.1	422.0	501.8	681.6
Greece	44.5	242.3	73.1	119.3	73.1	558.2	92.9	166.0	526.1
Ireland	294.2	363.2	426.0	172.6	181.8	165.9	176.9	197.5	270.8
Netherlands	1,527.4	1,400.8	1,169.7	1,084.5	1,627.0	2,050.1	1,288.5	1,449.2	1,004.7
Portugal	133.1	49.6	213.9	41.2	310.8	40.0	49.7	60.2	78.8
Spain	1,121.6	933.5	731.6	418.9	464.3	275.8	289.1	326.9	236.9
Switzerland	238.4	1,166.9	563.0	294.4	408.4	339.4	1,666.0	955.9	687.6
Nordic Countries, total	1,955.1	2,146.9	1,245.7	784.3	639.7	821.5	2,337.7	1,303.3	2,127.3
Denmark	320.0	444.4	334.1	87.9	124.0	204.7	285.4	231.6	506.6
Finland	233.1	196.5	76.2	132.8	155.2	161.8	1,237.6	445.2	602.7
Iceland	141.3	39.9	4.5	3.6	3.4	1.7	61.2	1.7	69.0
Norway	343.2	414.9	276.7	191.6	155.1	83.8	204.0	219.2	240.7
Sweden	917.5	1,051.2	554.2	368.3	202.0	369.4	549.4	405.6	708.2
Central/Eastern Europe, total	181.2	212.4	579.4	461.8	509.1	358.2	113.1	696.9	1,247.5
Austria	90.5	104.9	196.2	97.6	20.7	108.2	22.2	186.4	239.5
Czech Republic	0.0	0.0	0.0	21.4	16.4	9.4	7.5	179.0	129.7
Czechoslovakia	0.5	3.4	153.4	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	3.1	95.2	87.4	160.5	35.1	4.2	6.9	4.2	4.2
Poland	87.1	8.8	120.1	155.7	80.1	87.4	55.0	272.4	18.3
Russia	0.0	0.0	21.3	25.2	353.4	145.8	18.0	42.1	851.8
Slovakia	0.0	0.0	0.0	0.1	0.0	0.1	0.5	11.7	0.2
Slovenia	0.0	0.0	0.9	1.4	3.4	3.1	2.9	1.0	3.8
Asia, total	9,478.5	11,450.4	13,223.7	14,528.2	13,268.4	11,597.4	13,105.3	17,073.0	19,716.6
China	802.9	1,233.5	2,115.3	2,302.4	1,969.1	1,093.0	1,694.0	2,175.7	3,555.7
Hong Kong	565.7	752.8	651.1	559.8	411.1	436.9	712.7	201.7	475.8
India	26.6	30.4	22.0	498.8	204.8	101.7	393.3	316.0	468.5
Indonesia	407.5	122.1	447.2	775.1	452.7	110.3	224.8	510.7	287.3
Japan	3,986.4	3,577.3	4,173.9	3,159.4	3,683.0	3,218.8	3,310.5	4,592.1	5,711.3
South Korea	1,118.6	1,638.5	1,669.2	1,570.8	1,747.5	2,312.7	2,255.9	2,447.8	1,857.7
Malaysia	438.9	661.3	818.9	1,508.3	978.2	274.3	321.3	1,421.0	1,376.3
Philippines	197.8	40.8	62.1	396.3	54.4	187.4	278.8	120.3	64.0
Singapore	774.9	1,243.3	916.8	1,397.6	1,761.0	1,422.4	1,490.0	1,874.8	2,184.7
Taiwan	617.8	1,275.6	1,339.3	2,056.8	1,678.0	1,780.3	1,433.5	2,240.2	2,912.6
Thailand	541.3	874.7	1,008.1	302.9	328.5	659.8	990.5	1,172.7	822.7
South America, total	1,182.8	1,622.6	1,492.4	865.7	389.4	901.5	1,102.8	1,441.2	2,117.0
Argentina	98.2	57.4	274.5	209.2	98.8	167.6	67.8	135.6	280.7
Brazil	890.7	1,398.6	992.3	596.9	236.5	534.0	683.3	1,012.4	1,349.9
Chile	168.3	146.7	213.2	48.0	47.5	158.0	342.2	270.7	448.3
Peru	25.6	19.9	12.3	11.7	6.5	41.9	9.6	22.5	38.2
Africa, total	230.3	423.6	292.9	338.1	140.3	171.4	183.2	292.1	812.1
Kenya	5.8	6.0	8.2	9.1	9.2	6.9	11.0	90.9	47.0
Nigeria	38.9	10.8	5.0	5.4	14.0	4.9	3.2	2.5	5.0
South Africa, Republic of	185.5	406.7	279.7	323.7	117.1	159.7	169.0	198.7	760.1
All other countries	5,642.5	5,322.4	7,519.0	6,448.2	5,233.6	3,922.2	6,148.7	8,238.0	11,434.8

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Exports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Weapons								
Total, all countries	1,624.2	2,023.8	1,891.7	1,747.8	1,567.3	1,898.0	2,191.5	2,349.8	2,177.2
NAFTA partners, total	147.1	249.0	185.8	203.1	182.7	167.6	193.4	238.3	172.5
Canada	138.6	239.0	167.4	188.2	170.2	157.0	175.5	181.0	133.3
Mexico	8.5	10.0	18.4	14.9	12.6	10.6	17.8	57.4	39.2
Europe Four, total	574.7	758.1	736.5	433.4	426.0	490.2	452.2	446.5	438.0
France	49.2	52.9	107.5	30.2	30.8	50.0	43.6	39.0	54.1
Germany, Federal Republic of	340.3	514.5	465.6	225.1	202.1	182.3	173.2	145.9	109.3
Italy	31.3	32.3	28.3	29.5	24.0	20.7	22.6	34.5	30.8
United Kingdom	153.9	158.4	135.0	148.6	169.1	237.2	212.9	227.1	243.9
Other Western Europe, total	142.5	170.6	204.8	162.5	126.7	133.0	207.3	153.2	144.3
Belgium	20.0	13.8	16.5	28.7	30.0	17.0	10.4	6.1	3.9
Greece	1.5	2.6	1.7	2.9	3.9	15.0	2.9	6.4	26.3
Ireland	1.2	0.9	0.8	0.8	1.2	0.8	0.8	3.4	1.7
Netherlands	34.7	46.0	69.3	71.8	36.7	38.8	84.2	81.3	72.3
Portugal	0.5	6.7	11.8	1.1	1.8	4.4	17.4	1.4	4.5
Spain	30.3	14.6	56.8	11.5	20.4	21.6	40.5	18.9	16.9
Switzerland	54.1	86.0	47.8	45.7	32.7	35.3	51.1	35.7	18.7
Nordic Countries, total	54.1	77.7	46.1	62.1	68.1	67.8	77.8	88.5	150.6
Denmark	5.1	2.3	3.5	4.9	11.1	5.5	9.1	9.8	15.9
Finland	2.9	3.0	2.0	1.2	1.4	4.1	3.1	4.4	5.8
Iceland	0.0	0.0	0.1	0.4	0.1	0.2	0.2	0.1	0.2
Norway	13.7	61.6	30.6	45.9	33.0	46.4	43.4	51.6	96.9
Sweden	32.4	10.8	9.8	9.7	22.5	11.6	22.0	22.6	31.7
Central/Eastern Europe, total	3.0	6.6	10.7	7.9	7.7	26.2	10.9	52.4	17.1
Austria	2.5	5.3	6.9	3.1	3.1	3.3	2.6	45.0	7.1
Czech Republic	0.0	0.0	0.0	0.1	0.2	0.5	0.8	0.5	0.5
Czechoslovakia	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.1	0.5	0.4	0.2	0.2	0.3	0.2	0.5	0.2
Poland	0.4	0.7	1.7	0.4	0.7	0.7	1.9	3.0	3.8
Russia	0.0	0.0	1.2	3.9	3.3	21.4	5.0	3.1	5.2
Slovakia	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0
Slovenia	0.0	0.0	0.0	0.2	0.1	0.1	0.2	0.2	0.3
Asia, total	440.3	539.9	491.5	692.9	592.3	715.3	908.6	867.4	700.6
China	13.9	22.9	18.7	23.9	20.0	40.7	35.4	34.0	16.5
Hong Kong	4.3	11.4	11.6	7.3	7.4	9.4	9.3	12.8	8.0
India	7.7	6.0	5.4	4.8	8.8	8.9	11.0	19.2	6.1
Indonesia	1.3	4.8	6.2	5.9	3.6	2.8	7.0	2.9	3.3
Japan	196.1	308.0	315.1	470.5	344.9	383.5	591.5	457.2	482.7
South Korea	49.3	71.5	49.6	33.0	25.9	39.9	57.8	61.6	61.6
Malaysia	4.7	2.9	2.3	3.8	2.9	8.6	9.1	9.0	3.0
Philippines	0.9	0.4	0.8	0.4	0.5	4.1	9.9	5.1	2.3
Singapore	36.4	36.7	22.3	26.2	28.0	31.4	40.1	35.0	32.5
Taiwan	124.6	65.5	57.8	114.1	146.5	174.0	132.8	220.8	80.0
Thailand	1.0	9.7	1.6	2.9	3.8	12.0	4.6	9.7	4.5
South America, total	14.2	15.3	14.9	10.3	12.2	19.7	16.1	22.0	28.3
Argentina	1.6	4.8	4.3	2.9	3.0	4.0	5.2	6.2	6.9
Brazil	9.7	7.4	7.0	5.1	4.8	10.5	6.1	9.6	15.5
Chile	2.2	2.5	3.4	1.5	4.1	2.6	2.2	2.4	4.6
Peru	0.6	0.5	0.1	0.7	0.2	2.6	2.5	3.8	1.4
Africa, total	9.2	10.8	8.6	3.6	6.0	5.9	6.9	6.3	9.4
Kenya	0.1	0.2	0.3	0.1	0.2	0.1	0.0	0.1	0.2
Nigeria	7.9	8.0	6.5	1.9	1.0	1.8	2.1	3.2	6.7
South Africa, Republic of	1.2	2.6	1.9	1.5	4.8	4.1	4.7	3.0	2.5
All other countries	239.2	195.9	192.8	172.1	145.7	272.2	318.4	475.1	516.6

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Exports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Nuclear technology								
Total, all countries	1,071.7	1,153.0	1,254.4	1,190.7	1,318.7	1,014.7	1,061.0	1,253.7	1,251.1
NAFTA partners, total	27.0	37.7	42.7	27.4	55.0	12.0	28.0	14.6	56.7
Canada	24.9	28.3	23.9	21.7	45.8	8.2	9.4	11.6	12.8
Mexico	2.1	9.4	18.8	5.7	9.2	3.8	18.6	3.1	43.8
Europe Four, total	80.8	105.1	94.7	101.4	102.1	90.0	78.1	86.6	176.5
France	17.0	13.7	12.9	24.1	31.6	26.4	17.8	15.2	26.1
Germany, Federal Republic of	30.9	39.8	46.5	48.0	39.3	39.4	32.1	43.8	108.3
Italy	9.8	10.3	9.6	8.3	8.1	6.3	7.2	9.9	5.9
United Kingdom	23.1	41.3	25.7	20.9	23.2	17.9	21.0	17.7	36.2
Other Western Europe, total	31.2	44.5	53.2	53.3	61.7	87.2	76.8	97.8	56.5
Belgium	4.0	5.0	3.8	8.7	5.3	10.3	27.4	32.0	2.6
Greece	0.2	0.5	0.5	0.6	0.4	0.7	0.4	0.3	0.4
Ireland	1.6	0.8	1.8	0.9	1.0	0.8	2.2	1.8	0.7
Netherlands	8.5	8.8	8.1	11.4	9.8	9.9	6.7	7.7	4.9
Portugal	0.5	1.9	0.8	0.2	0.1	0.3	0.0	0.1	0.7
Spain	9.0	23.5	30.3	27.0	39.9	61.1	35.6	50.4	43.0
Switzerland	7.3	4.0	7.8	4.5	5.1	4.0	4.6	5.5	4.3
Nordic Countries, total	37.7	19.4	17.3	9.0	12.8	43.3	49.7	18.3	36.5
Denmark	0.8	2.0	0.7	2.4	1.8	1.4	3.3	1.5	1.6
Finland	2.0	2.6	2.2	1.0	0.7	1.6	0.9	4.3	2.5
Iceland	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Norway	0.5	0.7	0.3	0.3	0.3	0.6	0.7	0.7	1.3
Sweden	34.4	14.2	14.1	5.3	9.9	39.7	44.7	11.7	30.9
Central/Eastern Europe, total	2.8	2.9	4.4	5.7	8.7	8.0	17.9	30.9	25.8
Austria	1.7	2.3	2.5	2.0	3.2	3.3	1.9	3.7	5.6
Czech Republic	0.0	0.0	0.0	0.5	1.1	0.6	6.0	18.9	4.8
Czechoslovakia	0.3	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.3	0.3	0.6	0.5	0.5	0.2	0.3	0.2	0.2
Poland	0.4	0.2	0.2	1.4	0.5	0.6	1.5	0.8	0.9
Russia	0.0	0.0	0.6	0.9	2.9	2.6	3.3	5.0	8.7
Slovakia	0.0	0.0	0.0	0.0	0.3	0.1	0.1	0.3	1.3
Slovenia	0.0	0.0	0.0	0.4	0.2	0.6	4.8	1.9	4.3
Asia, total	869.3	918.3	1,005.0	966.4	1,042.5	747.6	776.0	973.8	865.6
China	3.5	5.6	4.2	3.2	2.9	12.6	4.5	2.5	9.4
Hong Kong	1.1	1.3	2.1	2.5	3.7	4.2	2.7	2.3	5.6
India	2.5	1.8	2.2	2.5	1.9	2.9	3.6	2.4	2.2
Indonesia	0.7	0.8	1.7	1.2	0.6	0.9	0.7	0.4	0.1
Japan	666.6	798.5	738.3	794.4	826.6	641.8	545.2	609.7	615.4
South Korea	110.7	78.0	83.2	115.3	81.9	65.0	164.5	189.3	128.4
Malaysia	0.4	0.7	0.7	1.3	0.7	1.7	1.3	4.1	1.3
Philippines	0.1	0.3	0.4	0.6	0.2	1.8	0.5	1.8	0.4
Singapore	0.4	1.2	2.1	0.9	2.8	1.5	1.2	2.6	2.7
Taiwan	82.8	29.2	169.8	44.0	120.6	12.6	50.6	157.3	99.2
Thailand	0.4	0.9	0.4	0.5	0.8	2.6	1.2	1.2	0.9
South America, total	5.0	4.0	3.6	5.4	5.8	6.7	9.5	8.5	13.6
Argentina	0.5	0.6	0.8	2.6	1.1	1.1	1.4	2.7	3.5
Brazil	3.9	2.5	2.5	2.2	4.4	4.0	5.7	5.1	9.3
Chile	0.5	0.8	0.2	0.6	0.3	1.4	0.3	0.2	0.6
Peru	0.1	0.0	0.1	0.1	0.0	0.2	2.2	0.5	0.2
Africa, total	0.6	0.9	0.7	0.8	0.6	0.5	1.1	0.6	0.4
Kenya	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0
Nigeria	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0
South Africa, Republic of	0.6	0.8	0.5	0.7	0.6	0.5	0.7	0.5	0.4
All other countries	17.3	20.2	33.0	21.2	29.4	19.3	24.0	22.7	19.4

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Exports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Software								
Total, all countries	1,351.8	1,625.2	2,079.7	2,530.2	3,027.9	3,057.9	2,617.7	3,020.8	3,325.0
NAFTA partners, total	460.4	522.7	631.8	740.6	930.0	919.4	719.3	842.5	1,153.1
Canada	442.3	497.6	592.6	681.3	826.4	864.8	658.2	753.9	995.0
Mexico	18.0	25.1	39.2	59.2	103.6	54.7	61.1	88.5	158.2
Europe Four, total	349.6	400.5	539.7	627.4	665.8	580.6	450.7	478.0	532.7
France	62.3	73.6	90.5	95.8	111.3	104.5	73.4	76.7	114.1
Germany, Federal Republic of	110.9	142.0	214.9	260.3	255.6	203.9	143.7	123.3	151.3
Italy	35.6	30.0	38.7	38.8	50.3	56.3	54.8	54.8	48.0
United Kingdom	140.9	154.8	195.6	232.4	248.6	216.0	178.7	223.3	219.4
Other Western Europe, total	101.8	139.5	192.9	223.3	259.2	252.9	196.0	205.1	264.9
Belgium	15.0	21.7	31.3	43.8	54.0	41.7	23.7	28.0	37.3
Greece	1.6	2.5	4.3	5.5	6.7	6.2	2.1	3.2	4.0
Ireland	4.2	9.5	21.7	33.8	32.9	38.2	32.0	27.5	38.3
Netherlands	38.0	55.4	67.8	81.6	95.9	97.3	85.6	98.5	117.7
Portugal	2.5	3.9	6.1	6.5	5.4	6.1	5.3	10.4	5.0
Spain	18.6	28.7	34.7	24.8	28.4	29.1	24.0	17.8	25.3
Switzerland	21.9	17.8	27.0	27.3	36.1	34.4	23.3	19.6	37.3
Nordic Countries, total	49.6	61.5	70.2	77.8	88.0	76.3	58.9	62.3	68.4
Denmark	7.7	21.4	20.4	26.7	27.7	16.6	13.8	14.1	14.7
Finland	5.8	4.8	6.0	7.4	9.3	12.5	6.5	8.3	8.5
Iceland	0.2	0.6	0.4	0.5	0.5	0.6	0.5	0.5	1.6
Norway	9.4	9.2	9.8	13.5	15.4	11.5	8.1	9.2	11.1
Sweden	26.5	25.5	33.7	29.6	35.2	35.1	30.0	30.2	32.4
Central/Eastern Europe, total	10.9	22.2	36.9	47.0	65.8	42.7	27.2	27.4	28.3
Austria	7.3	10.3	12.0	14.0	14.2	10.7	9.6	8.4	10.2
Czech Republic	0.0	0.0	0.0	7.1	12.7	5.5	2.6	2.7	3.2
Czechoslovakia	0.3	4.3	6.5	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	2.5	4.2	9.8	9.5	7.9	3.5	1.8	3.6	3.7
Poland	0.8	3.3	6.0	7.4	10.8	7.4	4.3	5.1	5.3
Russia	0.0	0.0	2.0	7.5	16.5	9.9	6.1	6.1	3.7
Slovakia	0.0	0.0	0.0	0.1	1.2	2.2	0.5	0.5	0.7
Slovenia	0.0	0.0	0.4	1.4	2.4	3.5	2.2	0.9	1.4
Asia, total	256.4	302.7	370.3	482.7	576.7	731.6	747.7	892.1	804.2
China	7.1	7.0	17.4	30.1	30.0	24.3	19.1	18.1	41.3
Hong Kong	16.6	25.3	31.1	42.8	49.4	87.3	64.5	85.6	63.3
India	5.5	4.7	6.5	6.5	9.3	33.1	29.4	35.6	52.6
Indonesia	2.3	2.1	2.0	2.5	1.5	3.0	2.3	2.5	0.7
Japan	143.6	170.4	180.2	205.0	261.0	337.8	384.4	474.1	437.7
South Korea	25.7	32.6	39.0	64.8	86.2	90.4	94.3	106.2	50.1
Malaysia	2.1	4.4	5.4	10.8	13.1	12.2	15.8	20.2	13.5
Philippines	3.8	0.8	1.4	3.2	3.0	3.7	6.4	5.8	4.8
Singapore	26.5	30.9	42.4	60.2	63.2	71.9	62.1	60.1	49.0
Taiwan	20.4	22.9	41.1	52.1	49.1	49.0	53.7	72.8	84.5
Thailand	2.9	1.6	3.9	4.8	10.9	19.0	15.9	11.1	6.5
South America, total	14.7	35.8	49.7	91.5	128.9	135.9	128.3	172.7	199.2
Argentina	2.0	18.1	17.7	34.5	37.2	19.8	20.4	31.2	35.6
Brazil	9.1	12.1	23.9	46.3	78.8	93.3	87.0	116.1	132.3
Chile	3.2	5.1	7.3	9.1	9.3	17.4	15.8	18.5	20.3
Peru	0.4	0.6	0.8	1.6	3.6	5.4	5.1	6.9	11.0
Africa, total	12.0	17.7	24.0	37.4	52.7	52.5	47.8	33.3	26.5
Kenya	0.1	0.1	0.1	0.6	0.3	0.5	0.3	0.2	0.5
Nigeria	0.5	1.1	0.6	0.9	1.0	0.9	0.2	0.3	0.8
South Africa, Republic of	11.4	16.5	23.4	36.0	51.4	51.1	47.3	32.7	25.2
All other countries	96.5	122.6	164.1	202.6	260.8	265.9	241.7	307.6	247.7

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Imports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	All technologies								
Total, all countries	59,381.2	63,252.1	71,871.5	81,233.1	98,116.5	124,787.0	130,361.6	147,289.7	156,673.1
NAFTA partners, total	7,022.1	8,018.8	8,808.8	8,506.5	10,830.6	13,706.7	16,337.2	19,300.7	21,314.2
Canada	5,783.8	6,883.8	7,240.3	6,940.5	8,315.1	10,223.0	11,593.2	12,974.8	14,322.0
Mexico	1,238.3	1,135.0	1,568.5	1,566.0	2,515.5	3,483.7	4,744.0	6,325.9	6,992.3
Europe Four, total	10,198.0	11,773.1	13,329.7	13,134.7	13,835.6	15,817.2	17,307.7	20,953.1	25,486.4
France	3,422.6	4,161.5	4,889.8	4,980.1	4,760.6	4,389.3	4,860.9	5,664.4	7,646.0
Germany, Federal Republic of	2,283.0	2,811.7	3,082.9	2,777.8	3,116.3	4,224.0	4,460.2	5,737.9	7,724.4
Italy	682.9	778.7	760.7	790.8	960.4	1,303.9	1,376.0	1,271.9	1,472.5
United Kingdom	3,809.4	4,021.2	4,596.3	4,586.0	4,998.1	5,899.9	6,610.5	8,279.0	8,643.4
Other Western Europe, total	1,688.2	2,349.9	2,699.7	2,926.4	2,561.7	4,192.1	4,430.3	6,330.3	7,939.4
Belgium	136.3	139.4	161.1	192.3	190.2	439.5	619.1	882.9	747.9
Greece	0.5	0.6	0.6	0.9	1.2	0.8	3.8	7.1	3.9
Ireland	427.2	598.5	698.5	951.5	761.0	1,710.3	1,639.9	2,725.5	4,518.3
Netherlands	682.9	1,035.2	1,284.6	1,193.4	982.8	1,101.5	1,005.1	1,276.3	1,182.4
Portugal	30.4	27.7	16.7	37.6	13.6	34.0	54.2	65.1	78.8
Spain	202.4	268.7	235.0	201.3	197.2	188.1	220.6	301.7	397.0
Switzerland	208.6	279.7	303.3	349.4	415.6	718.0	887.7	1,071.7	1,011.1
Nordic Countries, total	867.3	921.7	791.9	742.1	766.3	1,082.1	1,453.6	1,448.4	1,574.3
Denmark	69.5	83.3	81.3	105.2	126.4	124.2	148.5	201.2	258.5
Finland	55.3	63.1	72.0	83.9	113.4	172.5	197.2	314.3	277.5
Iceland	0.3	5.0	1.2	8.4	1.8	1.6	3.0	1.3	8.0
Norway	98.8	100.1	104.6	105.8	110.0	142.1	147.2	179.7	216.1
Sweden	643.4	670.2	532.8	438.9	414.7	641.7	957.7	751.9	814.3
Central/Eastern Europe, total	93.9	68.8	112.0	184.5	398.6	598.2	709.3	1,024.0	1,695.4
Austria	82.7	58.3	83.9	81.1	136.7	175.2	214.6	234.5	260.3
Czech Republic	0.0	0.0	0.0	12.6	14.5	28.6	42.4	66.3	75.3
Czechoslovakia	0.1	0.7	3.2	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	5.6	6.1	6.3	13.2	21.8	34.9	148.4	451.5	840.5
Poland	5.4	3.7	3.7	4.6	9.3	20.8	39.4	37.5	57.0
Russia	0.0	0.0	14.5	70.2	194.4	305.5	242.9	222.5	451.6
Slovakia	0.0	0.0	0.0	1.6	0.6	0.9	1.3	1.2	2.9
Slovenia	0.0	0.0	0.4	1.1	21.2	32.4	20.3	10.5	7.8
Asia, total	37,726.9	38,358.4	44,216.0	54,062.1	67,918.6	87,257.9	87,539.6	95,104.9	94,348.5
China	162.5	356.1	594.9	1,107.7	2,324.5	3,456.0	3,826.1	4,867.4	6,124.9
Hong Kong	1,200.3	1,048.9	1,159.7	1,437.0	1,384.8	1,776.8	1,664.1	1,763.5	1,483.8
India	10.3	15.8	18.0	36.3	48.2	99.8	155.6	276.0	154.1
Indonesia	19.9	89.4	281.6	380.7	521.3	594.3	582.6	810.5	904.6
Japan	19,453.6	19,799.5	21,458.4	24,959.3	28,727.3	32,950.1	30,527.9	31,772.1	28,976.7
South Korea	3,693.8	3,357.1	3,657.0	4,672.4	6,660.3	11,134.3	9,517.0	9,823.8	9,382.6
Malaysia	1,905.1	2,331.3	3,368.7	4,968.1	6,995.6	9,676.6	9,636.2	10,386.1	11,369.0
Philippines	657.8	765.5	1,049.5	1,327.4	1,655.2	2,525.3	3,468.5	5,056.0	6,368.4
Singapore	5,795.1	5,954.7	7,057.8	8,452.8	10,845.5	13,685.4	15,561.1	15,195.2	14,006.8
Taiwan	3,695.9	3,440.0	4,079.2	5,014.9	6,424.3	8,680.7	9,934.8	11,877.4	12,275.2
Thailand	1,132.8	1,200.1	1,491.1	1,705.5	2,331.6	2,678.5	2,665.7	3,277.1	3,302.3
South America, total	363.0	243.1	235.4	187.6	150.9	221.8	271.6	420.7	1,040.6
Argentina	6.0	8.3	32.6	28.7	34.5	15.8	11.8	19.7	56.4
Brazil	354.2	234.1	201.8	158.2	115.0	204.6	257.0	396.6	983.0
Chile	0.5	0.5	0.6	0.6	1.1	1.0	1.4	3.0	0.7
Peru	2.4	0.2	0.4	0.2	0.3	0.4	1.4	1.4	0.5
Africa, total	2.7	1.8	7.3	8.0	14.7	18.4	15.7	9.3	14.6
Kenya	1.0	0.4	4.0	1.5	0.7	2.9	3.1	3.3	1.3
Nigeria	0.1	0.1	0.0	0.2	0.2	3.2	0.1	0.0	0.4
South Africa, Republic of	1.7	1.3	3.2	6.2	13.8	12.3	12.5	5.9	12.9
All other countries	1,419.1	1,516.5	1,670.7	1,481.2	1,639.4	1,892.6	2,296.7	2,698.2	3,259.8

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Imports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Biotechnology								
Total, all countries	32.1	48.7	48.8	59.2	73.3	444.8	548.8	825.9	748.2
NAFTA partners, total	10.3	9.1	10.3	8.7	9.6	15.1	12.0	10.3	29.5
Canada	1.2	0.2	0.0	0.2	0.1	10.9	7.9	7.7	18.5
Mexico	9.1	9.0	10.3	8.5	9.5	4.2	4.1	2.6	11.0
Europe Four, total	11.0	23.3	21.3	16.3	11.0	98.7	129.9	170.6	220.5
France	3.7	6.0	3.1	3.1	2.9	42.3	61.4	104.7	109.6
Germany, Federal Republic of	5.1	14.0	15.9	11.1	5.7	14.5	18.8	17.5	39.9
Italy	1.4	1.7	1.4	1.7	2.2	7.0	13.0	11.2	9.9
United Kingdom	0.7	1.6	0.9	0.4	0.2	34.8	36.7	37.2	61.0
Other Western Europe, total	7.2	11.3	12.7	29.1	28.3	266.6	327.5	569.3	425.2
Belgium	0.2	0.0	0.0	0.0	0.2	176.0	185.9	270.1	200.6
Greece	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ireland	0.6	1.0	2.6	3.1	1.1	4.6	18.6	54.8	69.6
Netherlands	5.4	4.7	3.9	7.3	11.1	29.9	58.8	54.2	52.6
Portugal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spain	0.0	0.1	0.0	0.0	0.0	8.8	5.0	6.9	7.9
Switzerland	0.9	5.5	6.2	18.6	15.9	47.3	59.1	183.3	94.5
Nordic Countries, total	0.8	1.1	0.6	0.8	2.8	6.7	3.2	5.6	7.3
Denmark	0.1	0.0	0.0	0.1	1.6	3.2	1.7	3.1	3.1
Finland	0.0	0.3	0.0	0.0	0.0	1.2	0.3	1.3	1.5
Iceland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Norway	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sweden	0.8	0.8	0.6	0.6	1.1	2.3	1.3	1.2	2.8
Central/Eastern Europe, total	0.6	1.0	0.8	1.6	19.1	30.6	25.8	14.8	18.9
Austria	0.2	0.1	0.3	0.3	0.0	0.4	0.1	1.5	4.2
Czech Republic	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.1
Czechoslovakia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.4	0.9	0.4	0.5	1.3	4.1	7.8	5.6	7.9
Poland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Russia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Slovakia	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.2
Slovenia	0.0	0.0	0.0	0.9	17.8	25.8	17.5	7.4	6.6
Asia, total	1.6	2.1	1.9	1.6	1.5	22.2	42.0	40.0	37.5
China	0.0	0.0	0.3	0.3	0.0	0.6	9.9	10.7	12.0
Hong Kong	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
India	0.2	0.2	0.0	0.0	0.0	0.0	1.5	0.5	0.8
Indonesia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Japan	1.4	1.9	1.6	1.3	1.0	21.5	29.9	28.7	24.6
South Korea	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
Malaysia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Philippines	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0
Singapore	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Taiwan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thailand	0.0	0.0	0.0	0.0	0.0	0.1	0.2	6.6	0.0
South America, total	0.0	0.0	0.0	0.0	0.0	0.1	0.0	5.7	4.1
Argentina	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	2.2
Brazil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9
Chile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Peru	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Africa, total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Kenya	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nigeria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
South Africa, Republic of	0.0	0.0	0.0	0.0	0.0	4.9	8.0	8.6	0.1
All other countries	0.6	0.8	1.1	1.2	1.0	4.9	8.0	8.6	5.2

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Imports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Life science technologies									
Total, all countries	3,417.6	4,305.8	4,821.4	4,607.5	4,821.5	6,607.2	7,832.7	10,002.4	12,425.9
NAFTA partners, total	186.6	277.7	379.6	250.2	290.8	450.1	559.4	890.3	847.1
Canada	79.6	101.4	119.5	120.1	145.3	175.9	228.3	467.9	376.0
Mexico	107.0	176.3	260.1	130.1	145.5	274.2	331.1	422.5	471.2
Europe Four, total	1,331.0	1,888.8	2,057.0	1,919.5	1,957.5	2,587.8	3,078.6	3,910.2	5,434.9
France	217.9	277.9	259.9	262.6	355.8	325.0	495.3	452.6	436.8
Germany, Federal Republic of	793.1	1,135.9	1,215.7	1,036.6	944.7	1,240.6	1,304.7	2,202.5	3,398.7
Italy	44.6	58.1	70.8	72.0	78.9	127.4	151.3	187.1	328.3
United Kingdom	275.4	416.8	510.7	548.3	578.0	894.9	1,127.3	1,068.1	1,271.0
Other Western Europe, total	354.1	446.5	517.5	647.2	606.3	1,024.9	1,511.5	2,365.6	3,165.1
Belgium	22.1	32.2	35.2	34.2	45.7	112.5	179.6	278.1	200.3
Greece	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Ireland	78.2	97.0	112.2	162.4	134.2	299.8	566.3	1,253.1	2,212.0
Netherlands	172.9	187.7	210.3	257.5	218.1	207.8	271.0	281.7	253.0
Portugal	0.6	0.2	0.3	0.2	0.6	1.3	1.6	0.5	0.7
Spain	10.4	15.4	15.7	24.5	20.7	25.3	24.0	41.1	38.6
Switzerland	69.9	114.0	143.7	168.5	187.0	378.1	469.0	511.0	460.4
Nordic Countries, total	99.3	104.9	95.1	112.4	123.0	218.3	229.6	270.6	340.3
Denmark	18.8	20.7	25.0	33.8	38.9	43.7	61.1	102.6	104.6
Finland	25.5	38.4	37.8	29.1	45.8	65.2	64.4	76.1	97.8
Iceland	0.0	0.0	1.0	1.8	0.4	1.3	0.5	0.8	5.5
Norway	5.6	3.5	2.1	3.4	3.8	10.4	12.5	13.9	22.0
Sweden	49.3	42.4	29.1	44.2	34.1	97.7	91.1	77.2	110.5
Central/Eastern Europe, total	15.1	18.0	29.5	83.2	198.9	338.6	265.7	205.8	101.1
Austria	11.1	13.8	10.8	16.5	24.1	53.4	57.4	74.5	65.5
Czech Republic	0.0	0.0	0.0	0.0	0.2	0.3	0.5	3.4	5.7
Czechoslovakia	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	4.0	4.0	4.6	7.8	9.2	6.9	5.3	7.7	15.1
Poland	0.1	0.2	0.5	0.3	0.7	0.6	0.8	0.9	0.9
Russia	0.0	0.0	13.2	58.3	161.3	271.7	200.3	117.8	13.0
Slovakia	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.0	0.7
Slovenia	0.0	0.0	0.2	0.1	3.2	5.4	1.2	1.5	0.2
Asia, total	869.2	1,027.1	1,117.7	1,117.9	1,195.0	1,421.8	1,593.4	1,655.9	1,785.2
China	14.0	14.8	48.8	58.5	101.7	100.2	151.4	192.2	230.8
Hong Kong	19.8	18.6	24.1	16.5	16.1	18.9	20.8	16.0	14.9
India	1.2	1.2	1.3	2.2	3.5	9.4	17.2	15.4	27.8
Indonesia	0.1	0.3	0.1	0.0	0.0	0.2	0.1	0.5	0.2
Japan	746.6	889.6	910.3	891.1	896.3	1,105.5	1,185.1	1,192.1	1,252.0
South Korea	8.6	7.3	7.2	6.4	7.4	8.5	10.5	20.9	28.1
Malaysia	0.2	0.7	1.3	1.6	2.3	8.8	9.1	12.8	11.5
Philippines	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.0
Singapore	63.2	75.0	100.2	107.7	110.6	130.8	151.5	165.2	175.2
Taiwan	13.3	16.2	20.4	26.8	49.0	30.1	40.5	32.3	34.4
Thailand	2.2	3.4	4.0	6.9	8.0	9.2	7.1	8.1	7.3
South America, total	2.5	3.6	1.7	2.3	1.6	3.0	3.1	5.6	53.6
Argentina	0.3	0.2	0.3	0.4	0.5	1.1	1.1	1.6	48.8
Brazil	2.1	3.4	1.3	1.9	1.1	1.8	1.9	3.8	4.8
Chile	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.0
Peru	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Africa, total	0.2	0.5	0.5	3.3	7.9	5.9	1.8	3.0	3.3
Kenya	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Nigeria	0.0	0.0	0.0	0.0	0.1	3.0	0.0	0.0	0.0
South Africa, Republic of	0.1	0.5	0.5	3.3	7.8	2.9	1.7	3.0	3.2
All other countries	559.5	538.7	622.7	471.6	440.6	556.8	589.6	695.5	695.2

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Imports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Opto-electronics								
Total, all countries	1,138.0	2,038.4	2,570.3	2,531.0	2,544.1	2,816.6	3,172.7	3,636.6	3,952.1
NAFTA partners, total	74.1	74.8	219.7	107.6	66.8	122.8	215.7	418.9	479.8
Canada	19.4	18.7	24.4	22.0	20.4	42.8	38.7	41.0	38.5
Mexico	54.7	56.1	195.3	85.6	46.4	80.0	176.9	377.9	441.3
Europe Four, total	42.3	104.6	90.7	93.3	89.1	132.0	142.0	154.5	167.3
France	2.9	5.3	4.7	9.7	11.3	10.3	15.6	21.7	25.2
Germany, Federal Republic of	16.0	57.1	41.7	38.3	38.8	59.0	48.9	65.5	70.7
Italy	1.4	1.9	4.0	13.3	8.4	16.0	4.6	13.0	14.3
United Kingdom	21.9	40.2	40.2	32.0	30.7	46.7	73.0	54.3	57.0
Other Western Europe, total	25.2	30.0	35.2	46.2	57.9	51.7	60.4	63.3	91.8
Belgium	7.3	3.6	4.2	3.8	6.1	5.8	11.3	7.9	16.0
Greece	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ireland	1.3	1.7	6.2	13.7	15.0	11.6	0.8	3.3	2.4
Netherlands	3.0	6.8	5.7	4.2	9.2	10.3	15.7	12.5	11.0
Portugal	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.9
Spain	0.1	2.0	1.0	1.2	1.0	1.6	0.6	2.7	9.1
Switzerland	13.6	15.7	18.0	23.3	26.6	22.3	31.9	36.8	52.4
Nordic Countries, total	7.2	9.2	4.5	10.4	10.8	12.9	16.9	20.9	13.3
Denmark	2.1	3.3	2.5	3.4	4.0	3.8	4.0	5.2	5.2
Finland	0.0	0.4	0.4	0.4	1.2	1.1	2.0	3.7	1.7
Iceland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Norway	0.0	0.0	0.0	0.9	0.4	0.2	0.7	1.2	0.6
Sweden	5.1	5.6	1.6	5.7	5.2	7.7	10.1	10.7	5.8
Central/Eastern Europe, total	13.5	7.0	10.9	11.9	6.1	9.1	5.1	4.7	4.1
Austria	13.4	6.9	10.5	6.0	4.7	8.5	3.9	3.8	2.9
Czech Republic	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.4
Czechoslovakia	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.0	0.0	0.0	2.1	0.8	0.2	0.4	0.2	0.2
Poland	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.1
Russia	0.0	0.0	0.0	3.6	0.4	0.3	0.5	0.4	0.4
Slovakia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Slovenia	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Asia, total	968.8	1,803.9	2,196.2	2,242.2	2,287.2	2,450.6	2,669.7	2,896.6	3,088.4
China	8.9	17.4	33.3	57.0	178.8	338.4	385.8	468.5	676.6
Hong Kong	2.9	9.2	14.5	9.1	9.5	28.7	12.7	11.2	15.1
India	0.1	0.1	0.0	0.1	0.4	1.6	4.8	3.5	7.3
Indonesia	0.0	0.0	0.0	0.5	0.1	1.6	75.3	67.2	100.9
Japan	798.3	1,603.1	1,939.5	1,825.8	1,459.3	1,175.6	1,000.1	1,097.1	1,156.1
South Korea	32.9	37.4	50.2	40.0	29.7	61.8	54.3	42.5	40.2
Malaysia	19.9	27.4	48.6	140.1	373.8	503.2	477.6	372.6	346.8
Philippines	0.2	1.7	3.1	6.3	13.1	49.8	91.6	104.5	62.1
Singapore	58.9	45.2	56.4	68.8	77.5	81.7	245.7	228.4	188.3
Taiwan	46.2	62.2	50.1	85.5	125.7	175.9	270.7	426.5	443.0
Thailand	0.6	0.2	0.4	9.0	19.5	32.3	51.0	74.3	51.9
South America, total	0.6	0.1	0.3	0.3	0.2	0.2	0.6	1.5	2.4
Argentina	0.1	0.0	0.1	0.0	0.2	0.2	0.3	0.4	0.5
Brazil	0.5	0.1	0.1	0.3	0.0	0.0	0.3	1.0	1.9
Chile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Peru	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Africa, total	0.0	0.0	0.1	0.1	0.5	0.6	0.4	0.0	0.0
Kenya	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Nigeria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
South Africa, Republic of	0.0	0.0	0.1	0.1	0.5	0.6	0.2	0.0	0.0
All other countries	6.3	8.8	12.8	19.0	25.3	36.7	62.0	76.3	105.1

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Imports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Computers and telecommunications									
Total, all countries	30,110.5	29,153.4	33,848.5	39,790.2	49,440.0	58,865.6	61,346.1	69,701.8	74,130.0
NAFTA partners, total	2,843.9	3,179.2	3,581.8	4,044.0	5,911.8	7,672.8	8,560.3	10,215.9	11,135.8
Canada	2,186.6	2,667.2	2,880.6	3,207.7	4,249.2	5,587.8	5,399.6	5,892.1	6,253.5
Mexico	657.4	512.0	701.2	836.3	1,662.5	2,084.9	3,160.7	4,323.8	4,882.3
Europe Four, total	1,601.8	1,849.1	2,176.9	2,189.8	2,801.7	3,596.7	3,580.9	3,772.2	3,273.6
France	276.5	291.8	323.6	362.4	503.8	485.0	607.1	479.0	517.8
Germany, Federal Republic of	425.7	565.1	659.7	572.7	655.1	782.2	606.1	644.2	658.9
Italy	195.1	72.8	97.2	202.1	288.1	483.2	358.0	369.6	371.5
United Kingdom	704.5	919.3	1,096.5	1,052.6	1,354.7	1,846.2	2,009.7	2,279.4	1,725.4
Other Western Europe, total	472.6	604.2	669.3	894.3	630.9	801.4	1,054.8	1,638.6	2,546.3
Belgium	31.5	46.1	65.8	76.8	71.9	73.9	118.8	158.5	123.5
Greece	0.1	0.1	0.0	0.1	0.0	0.2	0.1	0.7	0.1
Ireland	246.3	400.7	457.1	608.5	350.2	513.3	687.0	1,161.8	2,001.6
Netherlands	122.0	91.9	95.7	136.0	139.2	136.8	129.0	156.1	155.3
Portugal	20.6	22.2	3.3	1.4	1.8	1.8	8.0	10.2	14.7
Spain	28.3	24.1	22.2	43.3	34.1	37.6	60.0	109.9	205.4
Switzerland	23.8	19.3	25.1	28.3	33.7	38.0	51.9	41.5	45.8
Nordic Countries, total	279.6	320.9	315.6	271.9	280.3	375.5	445.1	466.1	425.6
Denmark	20.8	31.3	32.1	27.3	34.6	38.0	36.2	33.9	49.0
Finland	18.6	11.4	21.8	32.4	33.8	38.2	31.7	142.2	93.2
Iceland	0.3	1.8	0.1	0.0	1.2	0.0	0.2	0.2	2.3
Norway	31.9	44.1	57.9	58.2	62.9	72.0	71.9	94.1	108.2
Sweden	207.9	232.3	203.6	154.0	147.8	227.2	305.1	195.7	172.8
Central/Eastern Europe, total	21.9	14.7	37.9	14.6	47.7	38.0	184.9	483.6	852.7
Austria	21.7	14.3	37.1	12.2	39.5	10.3	23.9	26.2	29.2
Czech Republic	0.0	0.0	0.0	0.3	0.5	0.6	3.7	10.4	7.2
Czechoslovakia	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.1	0.3	0.1	0.1	4.6	15.5	127.3	423.8	794.5
Poland	0.0	0.1	0.2	0.1	1.3	9.9	24.6	18.4	16.2
Russia	0.0	0.0	0.5	1.1	1.8	0.8	3.7	3.0	3.3
Slovakia	0.0	0.0	0.0	0.8	0.0	0.0	0.3	0.4	1.6
Slovenia	0.0	0.0	0.0	0.0	0.1	0.9	1.4	1.5	0.6
Asia, total	24,570.5	22,825.1	26,515.7	31,844.3	39,136.5	45,784.2	46,733.0	52,267.8	54,625.1
China	114.0	293.1	467.4	878.0	1,900.0	2,740.5	2,886.7	3,708.1	4,487.6
Hong Kong	889.6	725.6	721.4	833.5	669.8	570.4	507.4	389.0	293.2
India	2.6	6.0	11.7	26.6	32.2	65.6	104.3	197.4	67.4
Indonesia	5.0	56.4	235.8	332.3	460.0	452.7	341.6	521.2	574.5
Japan	13,055.9	11,580.4	12,415.7	14,296.0	16,103.2	16,384.2	15,250.6	15,829.8	15,051.6
South Korea	1,876.4	1,372.7	1,464.3	1,943.4	2,497.9	3,750.3	2,848.4	3,353.2	3,554.6
Malaysia	330.0	756.1	1,359.1	2,052.5	3,142.4	4,091.1	4,016.3	4,761.5	6,632.9
Philippines	94.7	115.6	225.0	252.8	258.9	502.5	949.2	1,716.8	2,392.3
Singapore	4,519.4	4,542.5	5,496.0	6,671.9	8,321.4	10,346.0	11,920.9	11,944.0	11,210.4
Taiwan	2,935.5	2,572.4	2,951.9	3,353.4	4,134.4	5,174.4	6,309.1	7,728.3	8,113.3
Thailand	747.3	804.4	1,167.3	1,203.9	1,616.3	1,706.6	1,598.5	2,118.5	2,247.2
South America, total	29.2	59.6	114.2	63.8	61.1	72.2	76.1	41.6	71.7
Argentina	5.3	7.9	31.4	26.8	25.0	5.9	3.4	2.9	2.0
Brazil	23.3	51.3	82.4	36.7	35.3	65.8	71.6	37.2	69.2
Chile	0.2	0.3	0.4	0.3	0.8	0.3	0.6	0.4	0.2
Peru	0.4	0.0	0.1	0.1	0.1	0.1	0.5	1.1	0.3
Africa, total	1.6	0.6	2.6	1.6	1.3	4.2	2.6	3.6	5.7
Kenya	0.1	0.1	1.7	0.6	0.3	2.3	2.0	2.7	0.8
Nigeria	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.4
South Africa, Republic of	1.4	0.5	0.9	1.0	0.9	1.9	0.6	0.9	4.6
All other countries	289.4	300.0	434.3	465.8	568.8	520.4	708.6	812.4	1,193.5

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Imports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Electronics									
Total, all countries	10,955.3	12,391.7	14,205.3	17,824.2	25,507.3	38,232.6	36,629.6	36,877.6	33,922.5
NAFTA partners, total	1,315.9	1,695.0	1,987.6	1,783.8	1,979.3	2,512.3	2,998.2	3,325.1	3,412.6
Canada	980.4	1,389.3	1,663.2	1,343.1	1,375.2	1,730.1	2,149.9	2,352.2	2,437.9
Mexico	335.5	305.7	324.4	440.7	604.2	782.2	848.4	972.9	974.7
Europe Four, total	597.3	613.8	649.7	751.6	1,624.7	2,346.4	2,283.7	2,130.6	2,205.3
France	74.0	64.8	76.8	84.5	403.5	763.3	849.6	688.0	896.0
Germany, Federal Republic of	258.2	286.0	300.3	297.1	491.1	698.7	708.0	712.9	681.5
Italy	41.5	33.5	40.0	84.6	236.3	213.9	205.8	170.4	112.3
United Kingdom	223.6	229.6	232.7	285.4	493.7	670.5	520.2	559.2	515.4
Other Western Europe, total	158.2	167.2	178.9	199.4	326.3	974.2	494.2	377.9	380.2
Belgium	4.3	1.9	2.6	3.5	7.8	12.2	38.2	37.3	40.6
Greece	0.4	0.3	0.1	0.0	0.0	0.0	0.1	0.8	0.1
Ireland	72.8	74.7	90.8	109.5	207.8	844.7	303.8	168.5	158.7
Netherlands	23.3	26.9	38.0	32.5	37.5	49.0	54.1	67.0	49.5
Portugal	8.5	4.7	12.2	34.4	10.5	30.4	43.7	51.8	57.2
Spain	39.5	49.5	29.8	9.0	48.9	18.6	26.2	19.7	17.0
Switzerland	9.5	9.1	5.5	10.5	13.7	19.1	28.1	32.9	57.1
Nordic Countries, total	17.7	19.9	13.8	28.4	40.3	56.1	95.4	101.2	92.5
Denmark	2.5	2.7	3.7	6.5	8.5	7.5	8.4	10.3	12.3
Finland	1.4	0.8	1.3	1.9	3.4	12.4	24.5	17.4	7.8
Iceland	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.0	0.1
Norway	0.7	2.3	0.8	0.9	0.8	2.3	2.5	5.2	4.0
Sweden	13.2	14.0	7.9	12.7	27.6	33.9	59.9	68.2	68.3
Central/Eastern Europe, total	13.0	9.8	6.7	24.0	45.1	62.3	84.5	87.1	111.0
Austria	12.5	9.7	5.7	20.6	39.5	51.9	67.8	69.2	82.7
Czech Republic	0.0	0.0	0.0	0.1	0.1	0.2	2.9	3.4	4.4
Czechoslovakia	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.0	0.0	0.3	0.9	2.6	5.5	5.6	10.8	17.3
Poland	0.5	0.0	0.4	0.7	1.3	2.3	1.8	2.5	5.1
Russia	0.0	0.0	0.1	1.7	1.3	1.7	5.8	1.0	1.2
Slovakia	0.0	0.0	0.0	0.0	0.3	0.4	0.5	0.1	0.0
Slovenia	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.3
Asia, total	8,796.4	9,804.4	11,294.4	14,965.4	21,276.6	32,066.2	30,409.5	30,547.1	27,264.7
China	1.1	2.2	6.9	29.8	86.6	170.9	232.4	336.8	553.0
Hong Kong	267.1	283.2	376.2	561.1	666.9	1,136.1	1,105.3	1,325.9	1,121.2
India	2.0	2.2	1.5	3.0	4.2	11.0	14.2	26.1	20.5
Indonesia	13.5	26.1	43.0	44.8	54.2	127.4	163.4	211.1	226.0
Japan	2,749.0	3,365.7	3,802.1	5,036.3	7,222.7	10,124.2	8,275.5	7,382.6	5,604.3
South Korea	1,618.7	1,771.7	1,945.7	2,483.1	3,947.8	7,038.5	6,264.4	6,040.4	5,331.5
Malaysia	1,538.2	1,528.3	1,877.1	2,675.7	3,397.7	4,970.0	4,972.0	5,083.0	4,189.6
Philippines	550.5	634.7	807.2	1,057.1	1,368.9	1,944.1	2,410.4	3,205.0	3,888.6
Singapore	1,052.5	1,140.8	1,215.5	1,341.1	2,020.7	2,771.6	2,948.2	2,525.8	2,089.9
Taiwan	626.5	668.6	911.0	1,263.8	1,840.9	2,887.8	3,087.4	3,409.6	3,286.7
Thailand	377.3	381.0	308.0	469.7	666.0	884.6	936.4	1,000.8	953.3
South America, total	5.8	5.0	5.1	4.8	2.0	2.0	3.5	1.9	8.3
Argentina	0.1	0.0	0.1	0.1	0.2	0.1	0.3	0.0	0.0
Brazil	5.7	5.0	5.0	4.8	1.7	1.9	3.1	1.9	8.2
Chile	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
Peru	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Africa, total	0.4	0.4	2.1	1.0	3.7	3.4	8.2	1.2	0.9
Kenya	0.4	0.2	2.0	0.8	0.3	0.4	0.8	0.4	0.4
Nigeria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
South Africa, Republic of	0.0	0.2	0.1	0.2	3.4	3.0	7.3	0.7	0.6
All other countries	50.6	76.2	67.0	65.9	209.3	209.8	252.4	305.7	447.0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Imports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Computer-integrated manufacturing								
Total, all countries	1,676.6	1,789.7	1,684.5	2,222.2	2,899.7	4,947.5	5,740.7	6,798.1	6,575.6
NAFTA partners, total	26.0	27.7	35.4	58.6	80.8	353.0	430.7	396.1	314.5
Canada	25.5	26.5	33.9	58.0	80.0	144.2	278.5	276.9	230.5
Mexico	0.6	1.3	1.4	0.6	0.7	208.8	152.2	119.2	84.0
Europe Four, total	314.1	298.4	301.5	342.0	397.7	773.6	989.6	1,156.7	1,238.7
France	18.8	12.2	12.6	17.6	18.2	61.1	65.1	77.0	88.9
Germany, Federal Republic of	171.5	198.7	196.5	221.3	222.4	418.2	535.5	661.2	718.7
Italy	29.0	25.8	27.5	35.8	62.9	76.0	113.9	98.9	125.5
United Kingdom	94.9	61.7	64.9	67.3	94.2	218.3	275.0	319.7	305.6
Other Western Europe, total	84.4	99.7	98.2	94.4	134.9	436.7	489.2	633.5	619.7
Belgium	4.3	0.5	0.8	5.7	4.8	12.3	15.2	8.8	16.5
Greece	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Ireland	0.0	0.3	0.2	0.4	1.0	3.5	8.0	6.4	5.8
Netherlands	15.2	35.0	27.8	18.4	16.4	254.2	278.2	395.1	349.4
Portugal	0.2	0.2	0.4	0.7	0.1	0.0	0.6	2.1	1.7
Spain	5.1	2.2	3.1	2.5	6.7	10.1	17.7	25.7	31.7
Switzerland	59.6	61.4	66.0	66.6	105.8	156.5	169.5	195.5	214.4
Nordic Countries, total	57.4	30.6	41.7	87.8	106.2	157.4	166.0	136.6	147.9
Denmark	0.2	0.3	0.5	1.0	2.9	3.5	4.3	5.9	10.5
Finland	6.0	7.3	5.0	12.8	14.9	16.9	23.2	30.0	37.2
Iceland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Norway	0.4	1.0	1.3	0.5	3.2	14.9	13.7	6.5	3.1
Sweden	50.8	22.0	35.0	73.4	85.3	122.0	124.8	94.1	97.1
Central/Eastern Europe, total	18.2	8.0	15.2	32.8	34.5	61.0	79.0	78.5	81.8
Austria	16.8	6.7	12.0	18.1	18.9	34.9	48.0	32.6	29.7
Czech Republic	0.0	0.0	0.0	11.2	12.2	22.7	27.8	38.8	44.9
Czechoslovakia	0.0	0.3	2.3	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	1.1	0.8	0.3	1.6	2.5	1.3	0.8	1.6	2.3
Poland	0.4	0.2	0.2	1.0	0.6	1.4	2.1	3.7	3.7
Russia	0.0	0.0	0.3	0.3	0.1	0.7	0.2	1.2	0.8
Slovakia	0.0	0.0	0.0	0.6	0.2	0.0	0.0	0.5	0.3
Slovenia	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Asia, total	1,162.6	1,309.6	1,166.1	1,581.8	2,109.5	3,110.1	3,511.5	4,287.9	4,095.8
China	1.1	1.1	1.2	3.0	3.3	19.7	21.4	31.1	37.3
Hong Kong	2.5	0.9	1.6	1.4	0.5	8.8	5.7	4.3	3.7
India	0.3	0.4	0.1	0.3	0.9	1.0	0.7	1.5	1.8
Indonesia	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.4
Japan	1,103.5	1,247.1	1,106.5	1,501.8	1,967.9	2,792.6	3,116.6	3,859.4	3,586.1
South Korea	9.4	11.1	9.6	16.6	41.4	122.1	162.7	182.4	185.8
Malaysia	0.7	0.9	0.8	0.8	1.6	5.0	10.3	1.7	2.7
Philippines	0.0	0.0	0.1	0.0	0.1	4.0	0.9	9.0	7.0
Singapore	10.1	10.6	12.1	8.7	12.8	26.3	35.3	35.3	40.8
Taiwan	31.4	29.1	26.7	37.4	63.6	103.6	133.5	147.1	209.1
Thailand	3.5	8.4	7.3	11.7	17.4	26.9	24.4	16.0	21.1
South America, total	0.6	2.2	1.3	3.6	8.3	15.7	22.9	28.8	11.3
Argentina	0.0	0.0	0.1	0.1	0.0	0.7	0.2	0.1	0.2
Brazil	0.5	2.2	1.2	3.5	8.3	15.0	22.4	28.5	11.2
Chile	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Peru	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0
Africa, total	0.0	0.1	0.0	0.0	0.0	0.0	0.6	0.2	1.5
Kenya	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nigeria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
South Africa, Republic of	0.0	0.1	0.0	0.0	0.0	0.0	0.6	0.2	1.4
All other countries	13.3	13.4	25.1	21.2	27.8	40.0	51.2	79.7	64.4

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Imports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Material design								
Total, all countries	1,045.6	1,051.5	1,548.4	2,052.9	1,091.8	1,527.6	1,347.2	1,400.1	1,137.2
NAFTA partners, total	63.4	74.3	105.2	60.7	45.8	41.6	168.3	143.5	207.5
Canada	42.4	58.5	93.7	49.5	40.0	33.3	150.6	123.5	182.6
Mexico	21.0	15.8	11.4	11.2	5.8	8.3	17.7	20.0	24.9
Europe Four, total	227.1	152.8	267.5	491.9	150.7	237.0	224.2	236.5	200.3
France	116.5	63.9	80.5	186.2	26.3	61.3	27.5	38.1	40.3
Germany, Federal Republic of	64.5	52.0	106.3	120.4	98.7	147.5	159.3	154.1	128.7
Italy	1.5	1.3	7.4	22.7	11.1	7.0	15.7	22.5	7.9
United Kingdom	44.6	35.6	73.4	162.7	14.7	21.3	21.7	21.7	23.5
Other Western Europe, total	18.4	26.6	29.7	50.6	13.5	24.3	33.0	34.8	34.1
Belgium	0.7	0.2	0.3	0.2	0.1	2.3	0.5	2.5	6.3
Greece	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Ireland	2.4	1.2	2.0	5.8	2.5	2.9	3.5	3.0	2.0
Netherlands	1.9	3.3	3.5	5.3	4.4	10.1	13.8	19.7	15.9
Portugal	0.2	0.2	0.2	0.4	0.0	0.0	0.0	0.0	0.0
Spain	10.5	18.3	17.0	29.4	0.1	0.1	0.3	0.1	0.1
Switzerland	2.7	3.3	6.7	9.6	6.4	8.8	15.0	9.3	9.8
Nordic Countries, total	8.8	16.2	16.2	19.7	15.1	16.3	20.3	30.7	61.7
Denmark	4.3	8.7	4.1	11.1	11.3	8.9	11.3	18.4	45.5
Finland	0.8	0.7	0.5	0.1	0.9	4.4	7.9	11.1	14.8
Iceland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Norway	0.6	0.2	0.1	0.1	0.0	0.1	0.1	0.2	0.7
Sweden	3.1	6.6	11.6	8.4	2.8	2.9	1.0	1.0	0.6
Central/Eastern Europe, total	0.8	1.3	1.3	2.9	6.5	12.5	12.4	11.1	7.8
Austria	0.6	0.7	1.1	2.2	4.3	5.6	3.9	2.1	0.8
Czech Republic	0.0	0.0	0.0	0.1	0.6	3.6	2.6	4.3	4.0
Czechoslovakia	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Poland	0.2	0.5	0.1	0.3	0.8	2.1	4.2	2.9	1.2
Russia	0.0	0.0	0.1	0.2	0.6	1.2	1.7	1.7	1.7
Slovakia	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Slovenia	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Asia, total	628.6	651.2	979.8	1,332.1	854.8	1,191.9	881.6	929.8	606.8
China	0.6	0.5	1.1	6.5	5.3	16.4	31.3	36.7	17.8
Hong Kong	10.5	8.0	10.4	11.6	8.7	9.6	4.0	3.0	2.8
India	2.9	2.3	1.9	1.1	1.4	2.9	4.8	5.1	4.8
Indonesia	0.3	0.1	0.2	0.1	0.0	0.2	0.1	0.6	0.1
Japan	485.3	461.8	673.9	847.2	478.9	660.8	629.9	690.5	426.6
South Korea	43.0	34.4	47.8	60.4	41.3	74.0	75.4	42.7	39.5
Malaysia	16.1	17.4	80.1	96.5	76.8	95.8	83.6	98.0	75.3
Philippines	12.0	12.5	12.6	8.1	5.7	9.1	1.2	0.6	0.2
Singapore	24.9	43.6	49.3	81.5	53.0	54.5	14.2	18.6	13.3
Taiwan	31.2	68.5	98.5	215.7	179.7	262.7	23.6	19.7	18.8
Thailand	1.8	2.1	3.9	3.5	3.9	6.0	13.6	14.4	7.5
South America, total	1.9	1.4	1.2	0.3	0.1	0.2	0.3	0.4	0.5
Argentina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brazil	1.9	1.4	1.2	0.3	0.1	0.2	0.3	0.4	0.5
Chile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Peru	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Africa, total	0.2	0.0	0.0	0.2	0.0	0.1	0.2	0.0	0.0
Kenya	0.2	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0
Nigeria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
South Africa, Republic of	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0
All other countries	96.3	127.7	147.4	94.5	5.4	3.6	6.8	13.3	18.5

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Imports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
Aerospace									
Total, all countries	10,713.8	12,106.0	12,687.2	11,613.3	11,135.6	10,540.5	12,805.7	17,106.5	21,984.0
NAFTA partners, total	2,414.0	2,575.0	2,336.9	2,059.2	2,317.2	2,381.5	3,185.8	3,745.0	4,688.1
Canada	2,363.8	2,526.1	2,291.1	2,019.4	2,281.5	2,343.5	3,140.0	3,683.4	4,619.5
Mexico	50.2	48.8	45.8	39.8	35.7	38.0	45.8	61.6	68.6
Europe Four, total	5,981.8	6,727.5	7,642.7	7,169.4	6,660.1	5,842.4	6,619.5	9,186.6	12,288.4
France	2,702.7	3,420.8	4,093.6	4,038.8	3,424.9	2,621.0	2,717.0	3,781.1	5,399.3
Germany, Federal Republic of	519.7	470.7	517.4	450.9	620.4	785.5	937.5	1,159.4	1,859.8
Italy	363.3	582.1	510.6	356.4	268.6	363.9	505.6	394.5	499.0
United Kingdom	2,396.1	2,253.9	2,521.0	2,323.3	2,346.2	2,072.0	2,459.3	3,851.6	4,530.3
Other Western Europe, total	543.4	933.6	1,115.0	889.3	674.2	483.9	359.3	548.9	554.9
Belgium	63.1	51.6	50.8	64.3	50.1	36.3	59.4	109.0	124.7
Greece	0.0	0.2	0.5	0.7	0.9	0.5	2.4	4.7	3.4
Ireland	23.5	17.5	9.7	13.5	15.3	18.0	38.3	66.1	55.3
Netherlands	325.6	665.6	883.8	699.3	500.6	303.0	118.4	218.5	214.0
Portugal	0.3	0.1	0.2	0.4	0.4	0.1	0.1	0.3	3.4
Spain	107.4	156.3	145.2	90.2	84.2	81.8	81.7	92.2	83.0
Switzerland	23.3	42.1	24.7	20.8	22.8	44.4	58.9	58.0	71.1
Nordic Countries, total	376.7	395.8	287.6	194.5	169.2	217.5	418.7	379.4	414.9
Denmark	17.9	12.8	9.8	10.8	14.9	12.1	15.7	18.6	24.5
Finland	2.4	3.6	4.8	6.5	12.8	25.2	29.3	24.8	19.1
Iceland	0.0	0.5	0.0	0.0	0.2	0.0	2.0	0.1	0.1
Norway	59.5	48.3	41.2	41.2	38.4	41.0	44.1	55.2	72.4
Sweden	296.9	330.6	231.7	136.0	103.0	139.3	327.6	280.7	298.8
Central/Eastern Europe, total	9.9	8.0	8.1	9.8	18.2	35.5	38.5	102.4	72.9
Austria	5.7	5.2	5.0	3.7	3.7	5.9	6.7	21.1	41.2
Czech Republic	0.0	0.0	0.0	0.4	0.7	0.9	4.2	5.7	7.6
Czechoslovakia	0.0	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.0	0.0	0.4	0.0	0.1	0.5	0.1	0.4	0.3
Poland	4.2	2.7	2.2	1.9	4.3	4.1	5.1	8.0	11.2
Russia	0.0	0.0	0.1	3.7	9.4	24.1	22.4	67.2	12.6
Slovakia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Slovenia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Asia, total	678.5	865.2	857.2	875.0	917.4	975.2	1,440.8	2,216.7	2,423.4
China	21.7	25.6	29.6	62.3	40.2	51.4	74.5	49.5	63.7
Hong Kong	6.3	0.9	2.3	1.5	10.7	2.1	3.8	12.9	7.5
India	0.4	2.9	0.7	0.5	0.8	0.5	0.8	3.1	9.8
Indonesia	0.9	6.6	2.5	3.0	6.1	12.0	1.9	9.7	2.0
Japan	487.3	614.5	575.3	526.4	564.8	638.2	1,002.5	1,647.1	1,783.0
South Korea	101.1	117.1	127.8	117.7	89.6	70.1	92.4	133.4	193.8
Malaysia	0.0	0.5	1.5	0.7	1.1	1.1	11.8	7.7	17.6
Philippines	0.4	1.0	1.5	2.9	8.4	9.4	9.8	17.2	9.8
Singapore	56.1	85.0	110.0	140.9	179.1	164.1	201.6	268.2	277.9
Taiwan	4.3	10.4	5.9	18.2	16.0	13.7	7.3	25.0	48.4
Thailand	0.0	0.7	0.2	0.9	0.5	12.7	34.4	42.9	9.9
South America, total	320.2	171.0	111.3	111.6	69.2	123.5	163.5	325.3	887.5
Argentina	0.1	0.1	0.6	0.5	0.7	3.4	6.1	2.0	2.3
Brazil	320.0	170.7	110.5	110.7	68.2	119.7	156.7	322.8	884.8
Chile	0.0	0.2	0.1	0.3	0.2	0.3	0.1	0.4	0.3
Peru	0.0	0.0	0.1	0.1	0.1	0.1	0.5	0.0	0.1
Africa, total	0.2	0.1	1.8	1.6	1.1	3.8	1.7	0.9	2.7
Kenya	0.1	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.0
Nigeria	0.0	0.0	0.0	0.2	0.1	0.2	0.0	0.0	0.0
South Africa, Republic of	0.1	0.0	1.5	1.3	1.0	3.6	1.6	0.8	2.6
All other countries	389.2	429.9	326.7	302.9	309.0	477.1	578.1	601.3	651.3

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Imports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Weapons								
Total, all countries	129.9	167.8	156.9	164.7	143.9	205.0	264.8	299.0	287.6
NAFTA partners, total	29.3	33.2	40.2	19.9	8.2	13.1	23.2	45.5	56.1
Canada	29.0	27.1	25.1	12.1	6.4	13.1	20.7	27.0	27.9
Mexico	0.4	6.1	15.0	7.8	1.8	0.0	2.5	18.5	28.3
Europe Four, total	61.4	76.0	62.3	90.7	71.4	93.0	131.6	128.3	113.6
France	2.0	13.4	25.2	0.6	0.0	2.0	2.3	1.3	2.1
Germany, Federal Republic of	20.4	19.2	7.6	11.7	15.9	33.9	82.8	80.6	68.6
Italy	4.0	0.8	0.7	0.5	0.8	3.7	4.1	1.8	0.7
United Kingdom	34.9	42.5	28.8	77.9	54.7	53.3	42.4	44.6	42.2
Other Western Europe, total	6.1	13.8	8.3	5.6	3.5	9.5	11.2	11.8	5.4
Belgium	0.9	1.1	0.3	2.6	2.1	2.6	2.0	1.8	0.0
Greece	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ireland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	3.0	4.1	1.6	1.4	0.2	3.5	5.8	7.7	1.6
Portugal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spain	0.9	0.6	0.7	0.8	0.9	3.3	3.0	1.9	3.0
Switzerland	1.3	8.0	5.7	0.7	0.3	0.2	0.4	0.4	0.7
Nordic Countries, total	14.8	18.5	13.3	4.8	5.5	0.7	2.0	11.3	9.2
Denmark	1.1	0.6	1.4	2.0	0.9	0.1	0.2	0.3	0.4
Finland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Iceland	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Norway	0.0	0.3	0.8	0.4	0.1	0.6	1.0	2.4	4.2
Sweden	13.7	14.9	11.0	2.4	4.5	0.0	0.8	8.6	4.6
Central/Eastern Europe, total	0.3	0.5	0.9	2.2	2.6	5.5	4.7	3.5	7.4
Austria	0.3	0.5	0.8	0.5	1.0	1.4	0.6	0.7	0.9
Czech Republic	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.2
Czechoslovakia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.5
Poland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Russia	0.0	0.0	0.1	1.3	1.6	4.1	4.0	2.6	4.7
Slovakia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Slovenia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Asia, total	6.5	8.4	8.1	11.2	13.1	57.3	74.4	75.5	80.0
China	0.9	0.8	1.4	3.4	2.3	14.3	29.1	31.6	30.5
Hong Kong	0.1	0.1	0.1	0.2	0.0	0.0	0.6	0.0	0.5
India	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6
Indonesia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Japan	2.2	2.6	2.6	3.5	4.7	11.6	9.2	9.9	9.6
South Korea	1.4	2.8	2.4	2.7	3.7	7.8	5.3	6.1	5.7
Malaysia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Philippines	0.0	0.0	0.0	0.3	0.0	5.2	5.1	2.2	3.3
Singapore	0.4	0.2	0.3	0.0	0.8	1.4	1.6	1.4	1.0
Taiwan	1.5	1.9	1.2	1.2	1.6	16.8	23.3	24.0	28.8
Thailand	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
South America, total	2.0	0.2	0.1	0.1	0.6	0.1	0.2	0.2	0.1
Argentina	0.0	0.0	0.0	0.1	0.5	0.0	0.0	0.0	0.0
Brazil	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Chile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Peru	2.0	0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Africa, total	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.2	0.3
Kenya	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nigeria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
South Africa, Republic of	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.2	0.3
All other countries	9.4	17.1	23.7	30.0	38.8	25.6	17.6	22.7	15.5

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Imports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Nuclear technology								
Total, all countries	4.5	3.0	5.2	7.9	22.7	39.8	85.1	134.9	765.1
NAFTA partners, total	0.2	0.3	0.2	0.1	0.2	7.5	8.2	13.2	18.8
Canada	0.2	0.3	0.2	0.1	0.2	7.5	8.2	13.2	18.8
Mexico	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Europe Four, total	0.5	0.9	2.8	3.0	0.8	15.4	33.9	32.0	217.8
France	0.2	0.0	2.2	1.9	0.5	3.1	5.7	11.3	120.3
Germany, Federal Republic of	0.1	0.7	0.0	1.1	0.2	4.4	19.0	9.5	48.4
Italy	0.0	0.0	0.0	0.0	0.1	1.0	0.6	0.1	0.2
United Kingdom	0.2	0.1	0.6	0.1	0.0	7.0	8.6	11.1	48.8
Other Western Europe, total	0.0	0.0	0.0	0.0	0.0	1.9	1.7	2.4	31.5
Belgium	0.0	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.6
Greece	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ireland	0.0	0.0	0.0	0.0	0.0	0.8	0.8	1.5	0.4
Netherlands	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	30.5
Portugal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spain	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Switzerland	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Nordic Countries, total	1.9	0.4	0.0	0.0	1.0	7.3	33.6	12.4	47.2
Denmark	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Finland	0.0	0.0	0.0	0.0	0.0	4.5	4.9	5.0	2.9
Iceland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Norway	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sweden	1.9	0.4	0.0	0.0	1.0	2.7	28.7	7.4	44.2
Central/Eastern Europe, total	0.0	0.0	0.0	0.0	17.7	0.3	1.7	25.9	411.0
Austria	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
Czech Republic	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2
Czechoslovakia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Poland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Russia	0.0	0.0	0.0	0.0	17.7	0.0	1.7	25.8	410.8
Slovakia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Slovenia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Asia, total	1.8	1.4	2.2	4.3	2.4	6.7	4.7	3.7	5.0
China	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.5	0.6
Hong Kong	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
India	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	1.3
Indonesia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Japan	1.8	1.4	2.2	4.3	2.4	5.8	3.6	2.1	2.9
South Korea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Malaysia	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.0	0.0
Philippines	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Singapore	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Taiwan	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Thailand	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.2
South America, total	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Argentina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brazil	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Chile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Peru	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Africa, total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kenya	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nigeria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
South Africa, Republic of	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All other countries	0.0	0.0	0.1	0.5	0.6	0.7	1.4	45.4	33.9

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 7-6.
U.S. trade in advanced technology products: 1990–98
(In millions of U.S. dollars)

Region or country	Imports								
	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Software								
Total, all countries	157.4	196.0	295.0	360.0	436.5	559.8	588.0	506.9	744.8
NAFTA partners, total	58.4	72.4	112.0	113.7	120.2	136.9	175.4	97.1	124.4
Canada	55.9	68.5	108.6	108.4	116.9	133.9	170.8	90.1	118.4
Mexico	2.5	3.9	3.5	5.3	3.3	3.0	4.6	7.0	6.0
Europe Four, total	29.7	37.9	57.2	67.2	70.8	94.3	93.9	74.9	126.2
France	7.4	5.3	7.5	12.8	13.5	14.9	14.4	9.5	9.6
Germany, Federal Republic of	8.7	12.2	21.9	16.5	23.3	39.6	39.6	30.5	50.5
Italy	1.0	0.6	1.2	1.7	2.9	4.8	3.4	2.8	2.9
United Kingdom	12.7	19.8	26.6	36.1	31.1	35.0	36.5	32.1	63.2
Other Western Europe, total	18.6	17.1	34.9	70.2	85.8	116.9	87.6	84.3	85.2
Belgium	1.9	2.1	1.0	1.2	1.4	4.8	7.4	8.1	18.8
Greece	0.0	0.0	0.0	0.1	0.1	0.0	1.2	0.8	0.2
Ireland	2.0	4.3	17.6	34.7	33.9	11.0	12.7	6.9	10.4
Netherlands	10.6	9.2	14.3	31.5	46.1	96.6	60.3	63.7	49.7
Portugal	0.0	0.0	0.0	0.1	0.2	0.4	0.2	0.2	0.1
Spain	0.1	0.1	0.3	0.3	0.6	0.9	2.1	1.6	1.1
Switzerland	3.9	1.3	1.7	2.4	3.6	3.1	3.7	3.0	4.8
Nordic Countries, total	3.0	4.1	3.4	11.4	12.3	13.5	22.9	13.6	14.6
Denmark	1.7	2.8	2.1	9.0	8.9	3.4	5.5	2.8	3.4
Finland	0.5	0.3	0.3	0.7	0.7	3.4	9.0	2.7	1.5
Iceland	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.0	0.1
Norway	0.1	0.3	0.3	0.4	0.5	0.6	0.9	1.0	0.9
Sweden	0.7	0.7	0.6	1.3	2.2	5.8	7.3	7.1	8.7
Central/Eastern Europe, total	0.5	0.5	0.7	1.4	2.1	4.8	7.0	6.6	26.6
Austria	0.5	0.4	0.5	1.0	1.1	3.0	2.3	2.8	3.2
Czech Republic	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.6
Czechoslovakia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	0.0	0.0	0.1	0.2	0.6	0.8	1.0	1.2	1.4
Poland	0.0	0.0	0.0	0.1	0.3	0.3	0.8	0.9	18.4
Russia	0.0	0.0	0.0	0.0	0.0	0.7	2.7	1.7	3.0
Slovakia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Slovenia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Asia, total	42.5	60.0	76.8	86.4	124.7	171.7	178.9	184.1	336.5
China	0.1	0.6	4.8	8.9	6.2	3.4	3.5	1.8	15.1
Hong Kong	1.5	2.4	9.1	2.0	2.5	2.3	3.5	1.1	24.8
India	0.7	0.7	0.7	2.4	4.8	7.6	7.4	22.6	11.9
Indonesia	0.0	0.0	0.0	0.0	0.8	0.1	0.0	0.1	0.4
Japan	22.2	31.3	28.7	25.6	26.2	30.1	24.9	32.8	80.0
South Korea	2.2	2.6	2.0	2.1	1.1	1.3	3.2	2.2	3.3
Malaysia	0.1	0.0	0.1	0.2	0.1	1.4	55.1	48.8	92.4
Philippines	0.0	0.0	0.0	0.0	0.1	1.1	0.4	0.3	2.1
Singapore	9.7	11.7	17.9	32.2	69.5	108.8	41.8	8.1	10.0
Taiwan	5.9	10.7	13.4	12.8	13.3	15.6	39.0	64.7	92.6
Thailand	0.0	0.0	0.0	0.1	0.1	0.1	0.1	1.6	3.9
South America, total	0.2	0.1	0.1	0.9	7.8	4.7	1.1	8.9	1.0
Argentina	0.0	0.0	0.0	0.8	7.5	4.4	0.3	6.9	0.5
Brazil	0.0	0.0	0.1	0.0	0.2	0.2	0.3	0.0	0.4
Chile	0.2	0.0	0.0	0.0	0.1	0.2	0.5	1.9	0.1
Peru	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Africa, total	0.1	0.1	0.0	0.0	0.1	0.2	0.1	0.2	0.1
Kenya	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nigeria	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
South Africa, Republic of	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1
All other countries	4.5	3.8	9.8	8.7	12.7	16.9	21.1	37.2	30.2

SOURCE: U.S. Bureau of the Census, Foreign Trade Division, Washington, DC.

See figures 7-13 and 7-14 in Volume 1.

Appendix table 7-7.
U.S. receipts and payments of royalties and fees associated with affiliated and unaffiliated foreign residents: 1987–97
(Millions of U.S. dollars)

	Foreign residents		
	Total	Affiliated	Unaffiliated
Receipts			
1987	9,914	7,629	2,285
1988	11,802	9,156	2,646
1989	13,064	10,207	2,857
1990	16,634	13,251	3,384
1991	18,107	14,395	3,712
1992	19,715	15,718	3,997
1993	20,323	15,707	4,616
1994	26,712	20,275	6,437
1995	30,289	22,859	7,430
1996	32,823	24,710	8,113
1997	33,676	25,515	8,161
Payments			
1987	1,844	1,296	547
1988	2,585	1,410	1,175
1989	2,602	1,778	824
1990	3,135	2,206	929
1991	4,076	2,996	1,080
1992	5,074	3,381	1,694
1993	4,765	3,364	1,401
1994	5,852	3,934	1,919
1995	6,919	5,257	1,663
1996	7,854	5,506	2,347
1997	9,411	7,087	2,324
Balance			
1987	8,070	6,333	1,738
1988	9,217	7,746	1,471
1989	10,462	8,429	2,033
1990	13,499	11,045	2,455
1991	14,031	11,399	2,632
1992	14,641	12,337	2,303
1993	15,558	12,343	3,215
1994	20,860	16,341	4,518
1995	23,370	17,602	5,767
1996	24,969	19,204	5,766
1997	24,265	18,428	5,837

NOTE: Details may not add to totals because of rounding.

SOURCE: U.S. Bureau of Economic Analysis, Survey of Current Business, Vol. 78, No. 10 (October 1998)

See figure 7-15 in Volume 1.

Appendix table 7-8.

U.S. receipts and payments of royalties and license fees generated from the exchange and use of industrial processes with unaffiliated foreign residents, by region and country: 1987–97

(Millions of U.S. dollars)

Region/country	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Receipts											
All countries	1,678	1,962	2,051	2,333	2,434	2,525	2,820	3,026	3,513	3,488	3,272
Canada	87	60	62	79	62	47	41	54	55	81	82
Europe	446	517	530	630	575	637	642	768	829	1,028	807
European Union	353	410	378	500	475	498	496	598	756	930	724
France	73	82	52	78	91	64	89	107	84	122	85
Germany[a]	79	73	77	107	97	108	109	142	171	218	168
Italy	57	73	68	105	70	99	69	71	66	65	75
United Kingdom	60	67	81	91	106	103	103	113	115	123	107
All other	93	107	152	130	100	263	272	170	73	98	83
So./Central America	64	48	54	59	85	73	D	83	D	D	69
Brazil	19	7	14	8	8	6	7	8	9	12	11
Mexico	14	13	18	23	31	29	28	33	24	26	25
All other	31	28	22	28	46	38	D	42	D	D	33
Africa	D	22	24	22	34	27	36	26	35	28	17
Middle East	D	18	17	22	25	21	33	20	35	23	40
Asia and the Pacific	936	1,185	1,248	1,465	1,638	1,704	1,966	2,063	2,462	2,238	2,249
China	NA	NA	NA	NA	NA	NA	NA	33	31	43	48
Hong Kong	4	6	7	6	6	11	12	15	22	8	D
India	18	40	26	21	14	34	D	28	27	37	31
Indonesia	5	5	8	11	20	13	20	20	15	13	23
Japan	723	883	897	1,028	1,219	1,268	1,434	1,372	1,548	1,388	1,437
Malaysia	*	*	2	2	2	7	18	19	D	D	D
The Philippines	3	4	4	4	2	3	D	1	2	2	7
Singapore	30	13	8	19	21	20	20	73	34	30	44
South Korea	34	107	167	249	225	220	278	396	607	478	391
Taiwan	21	46	34	55	57	42	34	39	80	129	148
All Other[b]	98	81	95	70	72	86	D	67	96	110	120
Payments											
All countries	459	525	612	665	796	818	1,054	1,034	948	1,233	1,265
Canada	9	11	8	16	11	10	8	11	13	57	76
Europe	320	355	433	482	637	635	820	712	572	765	774
European Union	248	279	342	360	426	417	472	395	461	635	613
France	33	37	51	54	73	D	92	92	121	192	199
Germany[a]	100	112	137	133	182	D	187	113	110	148	148
Italy	25	20	22	29	34	24	9	7	9	D	D
United Kingdom	72	90	102	111	106	125	123	104	126	132	111
All other	72	76	91	122	211	D	409	317	111	130	161
So./Central America	5	*	*	*	1	D	D	D	D	D	2
Brazil	*	*	*	*	*	*	2	2	*	*	*
Mexico	3	*	*	*	*	1	*	1	D	*	D
All other	2	NA	NA	NA	1	D	D	D	D	D	D
Africa	*	4	*	0	*	*	*	1	*	4	3
Middle East	2	3	4	3	4	5	9	9	13	10	9
Asia and the Pacific	95	112	120	160	140	152	200	283	333	382	391
China	NA	NA	NA	NA	NA	NA	NA	7	*	D	D
Hong Kong	1	*	*	0	*	*	2	3	D	*	*
India	*	*	*	*	*	*	0	*	*	0	*
Indonesia	0	*	0	0	0	*	0	0	*	*	0
Japan	88	108	109	141	138	145	191	262	307	305	334
Malaysia	0	0	0	0	0	0	*	0	*	*	*
The Philippines	0	*	1	0	0	*	*	*	*	*	*
Singapore	*	0	0	0	*	D	*	*	*	*	0
South Korea	*	*	D	D	*	1	1	6	D	D	D
Taiwan	*	*	D	1	*	2	2	2	*	*	*
All other[b]	6	4	10	D	2	D	4	3	26	77	57

See explanatory notes, if any, and SOURCE at end of table.

See figure 7-8 in Volume 1.

Appendix table 7-8.

U.S. receipts and payments of royalties and license fees generated from the exchange and use of industrial processes with unaffiliated foreign residents, by region and country: 1987–97

(Millions of U.S. dollars)

Region/country	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
						Balance					
All countries	1,219	1,437	1,439	1,668	1,638	1,707	1,776	1,992	2,565	2,255	2,007
Canada	78	49	54	63	51	37	33	43	42	24	6
Europe	126	162	97	148	-62	2	-178	56	257	263	33
European Union	105	131	36	140	49	81	24	203	295	295	111
France	40	45	1	24	18	D	-3	15	-37	-70	-114
Germany[a]	-21	-39	-60	-26	-85	D	-78	29	61	70	20
Italy	32	53	46	76	36	75	60	64	57	D	D
United Kingdom	-12	-23	-21	-20	0	-22	-20	9	-11	-9	-4
All other	21	31	61	8	-111	D	-137	-147	-38	-32	-78
So./Central America	59	48	54	59	83	D	D	D	D	D	67
Brazil	19	7	14	8	8	6	5	6	9	12	11
Mexico	11	13	18	23	30	28	28	32	D	26	D
All other	29	28	22	28	45	D	D	D	D	D	D
Africa	D	18	24	22	34	27	36	25	35	24	14
Middle East	D	15	13	19	21	16	24	11	22	13	31
Asia and the Pacific	841	1,073	1,128	1,305	1,498	1,552	1,766	1,780	2,129	1,856	1,858
China	NA	NA	NA	NA	NA	NA	NA	24	31	D	D
Hong Kong	3	6	7	6	6	11	10	12	D	8	D
India	18	40	26	21	14	34	D	28	27	37	31
Indonesia	5	5	8	11	20	13	20	20	15	13	23
Japan	635	775	788	887	1,081	1,123	1,243	1,110	1,241	1,083	1,103
Malaysia	NA	0	2	2	2	7	18	19	D	D	D
The Philippines	3	4	3	4	2	3	D	1	2	2	7
Singapore	30	13	8	19	21	D	20	73	34	30	44
South Korea	34	107	D	D	225	219	277	390	D	D	D
Taiwan	21	46	D	54	57	40	32	37	80	129	148
All other[b]	92	77	85	D	70	D	D	64	70	33	63

* = less than $500,000; D = withheld to avoid disclosing operations of individual companies; NA = not available

[a]German data prior to 1990 are for the former West Germany only. Beginning in 1990, these data are also for the former East Germany.

[b]Includes data for China for years prior to 1994.

NOTE: Industrial processes include patents and other proprietary inventions and technology.

SOURCE: U.S. Bureau of Economic Analysis, *Survey of Current Business*, Vol. 78, No. 10 (October 1998): 94- 97.

Appendix table 7-9.
R&D performance in the United States, by industry: 1973–96
(Millions of current purchasing power parity dollars)

Industry	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Total, all industries	**21,250**	**22,887**	**24,206**	**26,996**	**29,825**	**33,304**	**38,226**	**44,505**	**51,810**	**58,650**	**65,267**	**74,800**	**84,239**	**87,823**	**92,155**	**97,015**	**102,055**	**109,727**	**116,952**	**119,110**	**117,399**	**119,595**	**132,103**	**144,667**
Total manufacturing	20,535	22,119	23,471	26,151	28,867	32,075	36,686	42,690	49,904	56,178	61,930	69,895	77,525	80,377	84,311	86,502	88,024	88,934	88,506	90,177	90,931	96,307	104,237	116,518
Food, drink & tobacco	269	298	335	355	415	472	528	620	638	779	827	1,082	1,136	1,286	1,206	1,229	1,275	1,414	1,277	1,386	1,345	1,476	1,566	1,564
Textiles, footwear & leather	64	69	70	82	83	89	101	115	116	136	150	182	218	246	243	260	260	297	283	275	318	357	395	486
Wood, cork & furniture	71	84	88	107	123	126	139	148	161	159	152	143	147	144	137	173	197	245	210	247	267	316	237	744
Paper & printing	194	237	249	313	333	387	445	495	566	566	552	593	576	541	604	788	879	1,059	1,235	1,245	1,649	1,694	1,773	2,181
Chemicals	3,040	3,541	3,907	4,285	4,611	5,133	5,877	6,844	8,335	9,516	10,219	11,027	11,436	11,582	12,139	13,816	15,134	16,750	18,382	18,981	20,851	21,030	20,628	22,010
Industrial chemical	1,418	1,643	1,766	1,925	2,085	2,272	2,521	2,859	3,540	4,112	4,272	4,608	5,056	5,185	5,535	6,161	6,261	7,004	7,587	7,437	8,375	7,830	7,398	9,094
Pharmaceuticals	698	807	981	1,091	1,117	1,308	1,517	1,777	2,085	2,492	2,913	3,319	3,484	3,658	4,100	4,906	5,808	6,287	7,061	7,944	9,146	9,633	10,215	9,773
Petroleum refining	498	622	693	767	918	1,060	1,262	1,552	1,936	2,141	2,258	2,312	2,220	2,018	1,897	1,997	2,180	2,306	2,498	2,277	2,152	1,950	1,760	1,654
Rubber & plastics products	426	469	467	502	491	493	577	656	775	771	776	788	676	721	607	752	885	1,153	1,236	1,323	1,178	1,617	1,255	1,489
Stone, clay & glass	199	217	233	263	287	324	356	406	460	513	624	733	835	950	995	738	637	616	483	510	538	591	448	468
Basic metal industries	308	358	443	506	538	560	634	728	878	987	1,085	717	740	803	730	637	686	739	714	522	669	690	593	746
Ferrous metals	163	181	215	256	284	314	375	443	555	613	637	381	324	345	252	253	251	238	228	224	289	297	213	279
Nonferrous metals	145	177	228	250	254	246	259	285	323	374	448	336	416	458	478	384	435	501	486	298	380	393	380	467
Fabricated metal products & machinery	16,232	17,138	17,941	20,023	22,234	24,718	28,318	32,970	38,306	43,003	47,780	55,040	62,076	64,443	67,874	68,440	68,507	67,201	65,297	66,351	64,627	69,645	78,101	87,829
Fabricated metal products	291	313	324	358	386	384	455	550	624	625	701	842	829	895	783	881	904	939	974	1,017	1,158	1,111	1,023	1,551
Nonelectrical machinery	816	882	976	1,085	1,225	1,400	1,611	1,939	2,417	2,411	2,392	2,404	2,394	2,396	2,428	2,682	2,729	2,753	3,555	3,534	3,431	4,004	5,041	6,108
Office machinery & computers	1,733	2,103	2,220	2,402	2,655	2,883	3,214	3,962	4,401	5,667	6,635	8,100	9,822	9,794	9,347	10,444	11,705	11,693	11,220	11,404	9,313	9,664	8,869	12,786
Electrical machinery	1,834	2,047	2,121	2,382	2,295	2,476	2,775	3,048	3,476	2,858	2,815	1,848	1,277	1,250	1,239	1,419	2,126	3,444	3,091	2,722	2,537	2,664	3,473	3,360
Electronic equipment & components	3,068	2,964	2,984	3,254	3,591	4,031	5,049	6,127	6,853	8,065	9,866	11,930	13,155	13,730	14,609	12,709	11,192	9,956	10,324	10,638	10,812	12,674	15,278	19,138
Shipbuilding	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Motor vehicles	2,405	2,389	2,340	2,778	3,358	3,879	4,509	4,955	4,806	4,797	5,318	6,057	6,984	9,732	9,279	10,085	11,020	10,256	10,388	9,924	11,718	13,406	15,003	16,022
Aerospace	5,052	5,278	5,713	6,339	7,033	7,536	8,041	9,198	11,968	14,451	15,406	18,858	22,231	21,050	24,458	24,168	22,331	20,635	16,629	17,158	15,056	14,260	16,951	16,224
Transport equipment	72	87	90	94	120	131	159	162	147	199	381	399	371	493	509	522	508	470	411	412	483	421	487	491
Instruments	961	1,075	1,173	1,331	1,571	1,998	2,505	3,029	3,614	3,930	4,266	4,602	5,013	5,103	5,222	5,530	5,992	7,055	8,705	9,542	10,119	11,441	11,976	12,149
Other manufacturing	158	177	205	217	243	266	288	364	444	519	541	379	361	382	383	420	449	613	624	660	667	508	496	490
Total services	715	768	735	845	958	1,229	1,540	1,815	1,906	2,472	3,337	4,905	6,714	7,446	7,844	10,513	14,031	20,793	28,446	28,933	26,468	23,288	27,866	28,149

SOURCE: Organisation for Economic Co-operation and Development, Analytical Business Enterprise R&D Database (Paris: April 1999).

See figure 7-18 in Volume 1.

Appendix table 7-10
R&D performance in Japan, by industry: 1973–96
(Millions of current purchasing power parity dollars)

Industry	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Total, all industries	**4,969**	**5,442**	**5,891**	**6,490**	**7,274**	**8,124**	**10,018**	**12,274**	**15,061**	**17,410**	**20,178**	**23,243**	**27,247**	**28,204**	**30,925**	**35,389**	**41,376**	**47,523**	**50,482**	**50,855**	**49,204**	**49,615**	**55,597**	**60,593**
Total manufacturing	4,714	5,176	5,555	6,144	6,866	7,701	9,506	11,657	14,393	16,697	19,322	22,256	26,249	27,173	29,843	34,085	39,868	45,645	48,589	48,683	46,970	47,397	53,495	57,239
Food, drink & tobacco	135	132	161	176	200	218	280	381	414	492	530	602	669	738	920	958	1,102	1,207	1,168	1,233	1,365	1,291	1,476	1,511
Textiles, footwear & leather	81	72	79	72	65	86	124	134	267	224	226	269	287	289	317	357	408	453	476	631	506	424	473	460
Wood, cork & furniture	11	14	21	26	28	33	40	43	52	56	91	60	56	72	77	87	151	126	161	146	168	177	204	197
Paper & printing	97	62	67	61	68	70	72	85	86	119	165	194	233	232	263	334	398	442	474	397	395	405	481	501
Chemicals	1,116	1,272	1,385	1,481	1,663	1,788	2,238	2,786	3,131	3,600	4,133	4,711	5,275	5,541	6,367	7,145	8,194	8,914	9,804	10,341	10,225	10,370	11,062	11,560
Industrial chemicals	663	771	793	836	915	956	1,176	1,439	1,655	1,930	2,144	2,523	2,727	2,957	3,406	3,794	4,311	4,619	4,962	5,113	5,067	5,061	5,401	5,579
Pharmaceuticals	246	271	333	378	416	478	665	742	906	1,034	1,283	1,336	1,568	1,576	1,813	2,040	2,291	2,647	3,058	3,422	3,419	3,496	3,800	4,019
Petroleum refining	49	53	60	62	93	88	98	254	168	188	221	253	313	316	334	367	423	472	459	478	445	438	401	377
Rubber & plastics products	158	177	199	206	239	266	299	352	401	449	485	599	667	692	815	943	1,169	1,177	1,326	1,327	1,295	1,376	1,460	1,585
Stone, clay & glass	106	130	146	180	182	207	274	325	349	403	501	594	799	865	847	974	1,113	1,104	1,346	1,140	1,078	1,009	1,183	1,287
Basic metal industries	304	367	403	443	464	505	600	789	985	1,098	1,151	1,266	1,564	1,684	1,665	1,814	1,986	2,279	2,638	2,435	2,362	2,086	2,172	2,137
Ferrous metals	227	275	312	344	358	383	451	574	704	788	823	869	1,103	1,176	1,168	1,224	1,347	1,558	1,866	1,657	1,555	1,313	1,264	1,214
Nonferrous metals	77	92	91	99	107	122	149	215	281	311	327	397	461	508	497	590	638	721	772	778	807	773	909	924
Fabricated metal products & machinery	2,811	3,068	3,227	3,638	4,117	4,707	5,785	6,979	8,969	10,546	12,361	14,358	17,154	17,510	19,128	22,138	26,205	30,763	32,121	31,948	30,477	31,160	35,973	39,104
Fabricated metal products	79	80	103	140	133	142	205	203	268	279	366	378	471	436	452	439	549	665	711	674	654	617	699	890
Nonelectrical machinery	458	633	666	648	823	745	915	1,150	1,371	1,569	1,752	1,994	2,297	2,332	2,534	2,772	3,387	4,111	4,349	4,236	4,356	4,618	4,962	5,242
Office machinery & computers	146	107	153	188	233	276	354	440	576	703	891	1,374	1,588	1,714	2,223	2,955	4,085	4,591	4,830	4,383	4,358	4,296	5,015	6,007
Electrical machinery	561	547	583	712	790	947	1,171	1,098	1,419	1,663	2,025	2,435	2,827	2,855	3,170	3,636	4,354	5,109	5,233	5,146	5,274	5,564	6,112	6,586
Electronic equipment & components	743	847	798	966	901	1,057	1,327	1,939	2,488	3,143	3,717	4,151	5,166	5,115	5,581	6,294	6,652	7,446	8,106	8,487	7,702	8,194	9,756	9,775
Shipbuilding	44	45	44	40	34	29	31	33	34	40	51	40	50	38	42	46	59	66	76	102	99	87	82	74
Motor vehicles	580	618	668	743	905	1,149	1,348	1,568	2,075	2,335	2,546	3,014	3,490	3,682	3,772	4,511	5,386	6,557	6,550	6,739	5,807	5,521	6,759	7,739
Aerospace	55	61	73	27	65	72	92	89	102	118	195	103	175	249	282	239	311	408	551	351	382	316	367	448
Transport equipment	28	12	14	26	35	45	53	71	111	117	115	111	165	170	100	75	85	89	89	91	95	104	118	134
Instruments	118	119	126	149	197	245	290	388	526	579	703	758	925	918	973	1,170	1,337	1,722	1,627	1,741	1,747	1,843	2,103	2,207
Other manufacturing	52	58	65	68	78	87	93	136	140	159	165	201	211	243	260	278	312	356	401	412	394	473	470	482
Total services	221	215	287	292	364	365	453	548	594	627	761	882	880	913	960	1,127	1,361	1,670	1,654	1,979	2,037	2,043	1,915	2,102

SOURCE: Organisation for Economic Co-operation and Development, Analytical Business Enterprise R&D Database (Paris: April 1999).

See figure 7-19 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 7-11.
R&D performance in the European Union, by industry: 1973–95
(Millions of current purchasing power parity dollars)

Industry	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Total, all industries	**11,584**	**12,926**	**14,431**	**15,987**	**17,544**	**20,093**	**24,045**	**26,887**	**30,689**	**33,777**	**35,980**	**39,746**	**45,311**	**49,190**	**53,189**	**57,714**	**62,981**	**67,768**	**70,417**	**73,806**	**73,074**	**73,960**	**77,737**
Total manufacturing	10,564	11,849	13,101	14,506	15,895	18,379	21,903	24,773	28,223	31,053	33,108	36,734	41,735	43,847	47,832	51,797	56,533	60,993	62,959	64,455	63,649	64,772	67,972
Food, drink & tobacco	230	273	298	335	363	417	479	530	551	585	597	700	773	828	884	921	1,079	1,154	1,184	1,275	1,334	1,357	1,428,5
Textiles, footwear & leather	121	142	135	134	131	148	153	138	138	146	159	188	205	214	207	212	216	224	301	317	351	400	412
Wood, cork & furniture	12	13	14	14	17	33	51	56	59	70	79	93	112	114	113	115	123	122	148	146	144	171	277
Paper & printing	76	81	88	92	99	116	141	158	175	190	202	224	243	263	286	294	336	370	369	363	350	395	477
Chemicals	2,622	2,983	3,405	3,803	4,171	4,654	5,306	5,978	6,991	7,669	8,055	8,854	10,017	10,643	11,975	13,309	14,676	15,841	16,024	16,743	16,761	16,837	17,435
Industrial chemicals	1,422	1,647	1,901	2,128	2,307	2,465	2,720	3,142	3,707	3,985	4,086	4,563	5,256	5,568	6,084	6,651	7,170	7,490	7,451	7,486	7,197	7,177	7,474
Pharmaceuticals	713	802	925	1,047	1,168	1,424	1,683	1,808	2,057	2,358	2,615	2,832	3,167	3,444	4,161	4,777	5,408	6,132	6,413	7,111	7,348	7,524	7,758
Petroleum refining	286	317	344	380	398	424	476	528	650	692	713	773	835	863	941	1,011	1,115	1,225	1,216	1,192	1,182	1,081	1,061
Rubber & plastics products	202	216	235	247	297	341	427	499	577	635	641	686	758	769	789	870	983	994	944	954	1,035	1,055	1,141
Stone, clay & glass	135	153	156	164	178	215	262	286	308	340	376	404	445	438	471	501	573	569	599	618	614	637	693
Basic metal industries	269	348	382	398	408	440	515	577	662	724	767	783	821	810	843	902	933	962	987	977	908	911	951
Ferrous metals	192	229	261	265	265	287	353	390	454	498	532	537	570	550	569	621	634	634	687	710	647	673	687
Nonferrous metals	76	119	120	133	143	154	162	187	207	226	235	246	251	260	274	280	298	328	300	267	261	238	264
Fabricated metal products & machinery	7,046	7,803	8,566	9,477	10,417	12,234	14,883	16,925	19,235	21,217	22,757	25,379	29,007	30,403	32,895	35,392	38,447	41,579	43,174	43,831	42,976	43,850	46,055
Fabricated metal products	109	123	140	161	190	267	370	441	522	631	694	741	833	859	892	948	1,003	1,148	1,039	1,035	1,039	1,097	1,051
Nonelectrical machinery	771	836	921	993	1,122	1,424	1,834	2,033	2,279	2,541	2,696	2,861	3,252	3,401	3,759	4,200	4,827	4,904	5,111	5,527	5,480	5,736	6,191
Office machinery & computers	365	403	464	574	706	787	898	967	1,128	1,281	1,415	1,713	2,025	2,058	2,270	2,559	2,769	2,906	3,069	2,943	2,717	2,423	2,308
Electrical machinery	941	1,093	1,201	1,292	1,330	1,518	1,725	1,898	2,139	2,377	2,513	2,896	3,501	3,948	4,172	4,249	4,166	4,172	4,967	4,861	4,890	4,908	4,335
Electronic equipment & components	1,693	1,954	2,229	2,492	2,795	3,449	4,257	4,947	5,656	6,213	6,761	7,390	8,214	8,348	9,204	9,809	10,503	11,340	10,808	10,931	10,875	11,411	10,879
Shipbuilding	83	84	83	87	90	88	81	84	90	105	118	136	141	154	147	134	150	187	171	225	223	225	302
Motor vehicles	1,224	1,313	1,431	1,599	1,826	2,119	2,560	2,866	3,242	3,669	4,041	4,548	5,118	5,481	6,018	6,763	7,572	8,410	9,161	9,818	10,063	10,282	11,169
Aerospace	1,642	1,761	1,843	1,994	2,039	2,215	2,718	3,188	3,609	3,782	3,886	4,395	5,132	5,331	5,561	5,793	6,481	7,374	7,538	7,112	6,247	6,222	6,771
Transport equipment	23	26	28	42	60	58	61	69	84	102	125	146	147	154	164	167	158	197	310	273	293	321	480
Instruments	195	209	226	243	260	310	377	431	486	516	509	552	644	670	709	770	819	942	1,001	1,106	1,149	1,225	2,569
Other manufacturing	52	53	59	89	112	122	114	127	104	111	116	110	114	133	158	151	150	172	174	185	210	216	242
Total services	703	810	932	1,046	1,207	1,267	1,370	1,444	1,656	1,885	2,091	2,261	2,645	4,383	4,400	5,090	5,610	5,920	6,466	7,727	8,248	8,307	8,669

SOURCE: Organisation for Economic Co-operation and Development, Analytical Business Enterprise R&D Database (Paris: April 1999).

See figure 7-20 in Volume 1.

Appendix table 7-12.
Number of U.S. patents granted, by inventor residence, inventor sector, and year of grant: 1963–98

	1963-1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Total	1,416,597	71,661	70,860	82,952	77,924	95,537	90,364	96,513	97,444	98,342	101,676	101,419	109,646	111,983	147,520	2,770,438
U.S. origin	970,240	39,556	38,126	43,520	40,496	50,186	47,390	51,179	52,253	53,231	56,066	55,739	61,104	61,707	80,294	1,701,087
Foreign origin	446,357	32,105	32,734	39,432	37,428	45,351	42,974	45,334	45,191	45,111	45,610	45,680	48,542	50,276	67,226	1,069,351
Japan	105,510	12,746	13,209	16,557	16,158	20,168	19,525	21,026	21,925	22,293	22,384	21,764	23,053	23,179	30,841	390,338
Germany	108,847	6,718	6,856	7,884	7,353	8,352	7,614	7,680	7,309	6,893	6,731	6,600	6,818	7,008	9,095	211,758
United Kingdom	57,477	2,494	2,405	2,775	2,579	3,094	2,789	2,800	2,425	2,295	2,234	2,478	2,453	2,678	3,464	94,440
France	41,280	2,400	2,369	2,874	2,661	3,140	2,866	3,030	3,029	2,909	2,779	2,821	2,788	2,958	3,674	81,578
Canada	23,447	1,342	1,314	1,594	1,489	1,959	1,859	2,036	1,964	1,944	2,008	2,104	2,233	2,379	2,974	50,646
Switzerland	24,960	1,233	1,211	1,374	1,245	1,363	1,284	1,335	1,197	1,127	1,169	1,056	1,112	1,090	1,278	42,034
Italy	14,131	919	995	1,183	1,076	1,297	1,259	1,209	1,271	1,285	1,215	1,078	1,200	1,239	1,582	30,939
Sweden	15,379	857	883	948	777	837	768	716	626	636	706	806	854	867	1,225	26,885
Netherlands	13,075	766	722	922	806	1,060	960	992	855	800	852	799	797	808	1,226	25,440
Taiwan	568	174	208	343	457	591	732	906	1,001	1,189	1,443	1,620	1,897	2,057	3,100	16,286
South Korea	172	41	46	84	97	159	225	405	538	779	943	1,161	1,493	1,891	3,259	11,293
Australia	4,382	340	374	389	416	501	432	463	409	378	467	459	471	478	720	10,679
Belgium	5,128	240	243	295	302	359	313	324	325	350	352	397	488	515	693	10,324
Austria	4,836	318	357	345	337	402	393	359	371	312	289	337	362	376	387	9,781
U.S.S.R.	5,774	147	116	121	96	161	174	178	66	65	53	12	16	4	6	6,989
Israel	1,701	179	189	245	238	325	299	304	335	314	350	384	484	534	754	6,635
Finland	1,738	200	210	275	232	230	304	331	361	293	312	358	444	452	595	6,335
Denmark	2,917	187	182	204	151	221	158	210	193	197	207	199	241	333	391	5,991
Spain	1,387	78	97	115	126	131	130	153	133	158	141	148	157	177	248	3,379
Norway	1,633	90	81	135	121	126	112	111	108	117	126	130	139	142	198	3,369
South Africa	1,453	96	88	107	103	134	114	105	97	93	101	123	111	101	115	2,941
Hungary	1,230	108	131	127	94	129	93	85	88	61	46	50	43	25	50	2,360
Czechoslovakia	1,758	54	35	46	33	34	39	27	17	13	19	15	8	9	9	2,116
Mexico	1,185	32	37	49	44	39	32	29	39	45	44	40	39	45	57	1,756
New Zealand	584	33	52	68	55	58	51	41	44	39	37	44	52	85	114	1,357
Hong Kong,S.A.R.-PEOP	301	25	31	34	41	48	52	50	60	60	57	86	88	81	160	1,174
Ireland	339	30	28	38	43	65	54	56	55	53	50	50	78	73	74	1,086
Brazil	396	30	27	34	29	36	41	62	40	57	60	63	63	62	74	1,074
Argentina	476	11	17	18	16	20	17	16	20	24	32	31	30	35	43	806
China P.REP.	108	1	9	23	47	52	47	50	41	53	48	62	46	62	72	721
Poland	512	11	14	13	8	14	17	8	5	8	8	8	15	11	15	667
India	261	10	18	12	14	14	23	22	24	30	27	37	35	47	85	659
Luxembourg	275	37	31	22	29	29	17	27	26	28	22	24	18	22	20	627
Singapore	53	9	3	11	6	18	12	15	32	38	51	53	88	94	120	603
Russian Federation										3	38	98	116	111	189	555
Liechtenstein	321	13	17	16	10	11	15	11	16	11	17	17	12	11	16	514
Others (122)	2,763	136	129	152	139	174	154	162	146	161	192	168	200	237	303	5,216
Ownership:																
U.S. corporations	735,977	31,181	29,490	33,726	31,437	38,664	36,093	39,133	40,308	41,826	44,036	44,035	48,741	50,220	66,062	1,310,929
U.S. government	32,911	1,139	1,022	981	733	880	983	1,183	1,161	1,166	1,258	1,028	923	944	1,018	47,330
U.S. individuals	236,317	9,265	9,477	10,887	10,122	13,028	12,542	13,207	12,751	12,281	12,805	12,885	13,729	12,914	16,407	408,617
Foreign corporations	330,653	25,957	26,545	32,371	30,960	37,506	35,548	37,594	38,239	38,401	38,788	38,688	41,476	42,907	57,668	853,301
Foreign governments	4,894	483	479	555	453	441	423	472	463	434	296	245	259	273	256	10,426
Foreign individuals	75,845	3,636	3,847	4,432	4,219	5,018	4,775	4,924	4,522	4,234	4,493	4,538	4,518	4,725	6,109	139,835

SOURCE: U.S. Patent and Trademark Office, Patenting Trends in the United States, 1963-98 (Washington, DC, 1999).

See figures 7-21, 7-22, and 7-23 in Volume 1.

Appendix table 7-13.
Patents granted in selected countries, by inventor residence: 1985–96

Granting country	Total patents	Patents to non-residents as percentage of total	Percentage of patents granted to residents of:									
			United States	Japan	Germany	France	United Kingdom	Italy	Sweden	India	Russian Federation	Other
					1985							
Japan	50,100	15.5	46.4	0.0	19.6	6.4	5.4	1.5	2.3	0.0	1.4	17.0
Germany	33,377	60.4	29.2	23.9	0.0	12.4	6.7	2.8	2.8	0.0	1.7	20.5
France	37,530	73.8	27.4	15.8	25.9	0.0	5.9	4.1	2.4	0.0	1.3	17.0
United Kingdom	34,480	82.3	28.6	20.8	20.9	8.4	0.0	2.9	2.2	0.0	0.6	15.6
Italy	47,924	79.0	6.1	2.3	8.0	4.2	2.0	0.0	0.4	0.0	0.0	77.0
Canada	18,697	92.8	54.8	11.7	8.8	5.6	5.3	1.5	1.8	0.0	0.4	10.0
Mexico	1,374	93.4	56.3	6.6	7.6	7.0	4.0	2.6	1.5	0.0	0.5	14.0
Brazil	3,934	84.6	37.0	7.3	20.7	9.9	4.0	4.6	2.8	0.0	0.4	13.3
South Korea	2,268	84.6	30.4	42.3	6.2	5.4	3.5	1.8	1.4	0.0	0.0	9.1
Soviet Union	74,745	2.0	13.7	8.4	16.9	8.2	3.1	3.9	2.7	0.0	0.0	42.9
India	1,814	76.2	33.5	6.4	11.2	8.1	10.1	3.4	1.3	0.0	3.0	23.0
					1990							
Japan	59,401	15.2	45.5	0.0	21.3	7.7	5.1	2.4	2.4	0.0	1.1	14.4
Germany	42,860	61.2	27.8	28.4	0.0	10.8	6.5	3.7	2.7	0.0	0.7	19.3
France	35,149	74.6	24.9	18.2	26.9	0.0	6.0	4.2	2.2	0.0	0.6	17.0
United Kingdom	32,179	86.4	25.6	20.8	22.8	9.1	0.0	3.2	2.0	0.0	0.4	15.9
Italy	17,794	98.7	23.7	9.4	28.5	12.4	6.8	0.0	2.4	0.0	0.1	16.7
Canada	14,187	92.2	52.2	13.7	8.3	6.0	5.4	2.0	1.8	0.0	0.3	10.3
Mexico	1,752	92.0	63.4	5.4	7.3	5.1	3.2	2.4	0.8	0.1	0.2	12.2
Brazil	3,355	86.5	41.4	6.6	16.1	9.4	7.4	4.4	2.3	0.0	0.7	11.8
South Korea	7,762	67.1	23.0	66.7	2.5	1.8	0.8	1.1	0.3	0.0	0.0	3.8
Soviet Union	84,658	1.4	12.0	8.1	18.8	7.8	3.6	6.7	3.8	0.0	0.0	39.2
India	1,611	81.0	35.3	9.3	14.6	6.2	7.8	3.1	1.2	0.0	3.4	19.1
					1994							
Japan	82,400	11.7	50.1	0.0	18.9	6.5	4.1	2.5	1.8	0.0	0.0	16.3
Germany	57,803	64.1	28.2	32.5	0.0	9.8	5.9	4.0	2.0	0.0	0.0	17.4
France	54,964	75.3	25.0	23.5	25.5	0.0	5.3	3.9	1.6	0.0	0.0	15.2
United Kingdom	48,772	89.3	24.9	25.7	22.0	8.0	0.0	3.3	1.5	0.0	0.0	14.5
Italy	37,096	85.5	24.8	13.4	27.6	10.2	5.9	0.0	1.9	0.0	0.1	16.1
Canada	11,641	92.7	51.3	18.8	7.6	5.6	4.6	1.5	1.0	0.0	0.0	9.5
Mexico	4,367	93.4	58.0	4.3	9.7	5.1	4.3	2.4	1.1	0.0	0.0	14.9
Brazil	2,469	83.0	41.3	6.6	12.5	6.9	4.9	6.4	2.7	0.0	0.0	18.7
South Korea	11,683	50.6	22.9	62.6	3.9	2.5	1.1	0.8	0.5	0.0	0.0	5.8
Russian Federation	20,581	22.0	4.0	2.1	4.7	1.1	0.8	1.5	0.6	0.0	0.0	85.2
India	1,735	74.2	42.9	6.1	12.4	7.1	6.6	2.6	1.6	0.0	0.2	20.4
					1996							
Japan	215,100	12.7	51.4	0.0	17.4	6.1	3.6	2.1	1.6	0.0	0.0	17.6
Germany	55,444	64.3	29.7	32.8	0.0	9.1	5.5	3.8	2.0	0.0	0.1	17.0
France	49,245	75.7	27.3	24.0	22.9	0.0	5.1	3.7	1.7	0.0	0.0	15.3
United Kingdom	44,335	90.3	27.4	25.5	20.0	7.7	0.0	3.1	1.7	0.0	0.0	14.6
Italy	37,935	78.2	26.8	14.3	25.2	10.0	5.4	0.0	1.9	0.0	0.0	16.4
Canada	7,145	90.1	52.2	24.1	6.0	4.1	3.1	1.4	0.9	0.0	0.0	8.1
Mexico	3,186	96.4	67.9	3.3	7.0	3.5	2.3	1.7	2.9	0.0	0.0	11.5
Brazil	1,487	87.3	37.8	8.2	15.7	7.4	4.2	4.3	2.3	0.0	0.0	20.1
South Korea	16,516	49.6	23.6	57.7	5.1	2.7	1.9	1.0	0.8	0.0	0.1	7.2
Russian Federation	19,678	16.2	8.2	3.5	8.9	3.5	2.4	2.3	1.1	0.0	0.0	70.2
India	1,020	64.8	42.4	6.1	15.3	6.4	8.2	1.4	0.5	0.0	0.3	19.7

NOTE: German data prior to 1996 are for the former West Germany only.

SOURCE: World Intellectual Property Organization, "Industrial Property Statistics" (Geneva, 1985-96).

See figures 7-23 and 7-24 in Volume 1.

Appendix table 7-14.
U.S. venture capital disbursements, by industry category: 1980–98

Industry category	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
										Millions of U.S. dollars disbursed									
Total disbursements																			
All industries	703.3	1,559.4	1,901.9	3,650.7	5,292.8	3,768.9	4,685.7	4,888.2	5,602.9	5,834.5	3,868.9	2,874.9	5,229.4	5,236.0	5,187.8	5,945.5	9,897.4	13,558.3	16,777.6
Biotechnology	50.0	100.3	87.0	141.6	124.1	155.7	328.3	362.8	395.5	355.5	309.6	278.9	586.4	500.0	515.8	454.9	675.6	1,102.7	1,031.8
Communications	74.8	181.8	231.4	510.3	497.8	558.6	620.7	488.5	914.5	867.1	472.8	327.2	1,169.2	917.3	922.7	1,027.1	1,531.8	2,524.2	2,870.6
Computer hardware	155.1	369.2	652.9	1,186.9	1,057.9	777.9	838.1	687.4	586.4	536.7	335.3	261.3	279.4	166.1	259.7	364.7	393.9	491.9	553.8
Consumer related	50.0	167.9	104.7	268.9	1,757.5	272.8	521.9	829.3	815.1	901.4	443.3	394.0	378.9	677.4	790.9	744.0	1,123.2	1,154.0	1,194.3
Industrial/energy	148.6	290.8	248.1	281.1	328.3	476.7	325.1	380.2	362.0	447.3	243.9	183.8	182.0	179.6	216.3	368.9	389.6	455.3	395.9
Medical/health	49.0	105.6	118.1	283.4	332.4	355.3	395.6	553.0	613.6	1,009.8	597.1	375.1	879.8	658.4	921.1	957.8	1,277.2	2,034.7	2,287.9
Semiconductors/other electronics	85.0	175.5	221.9	354.7	471.4	480.9	510.6	498.4	453.8	358.5	297.6	217.6	243.2	171.5	265.8	344.1	532.1	742.1	871.1
Software and services	19.3	52.6	154.0	382.6	492.2	443.1	499.1	500.8	469.4	513.9	673.9	509.1	685.2	1,419.3	851.3	1,104.6	2,560.4	3,676.1	5,750.8
Other products/services	71.4	115.7	83.8	241.2	231.1	247.9	646.4	587.9	992.6	844.3	495.4	327.9	825.3	546.4	444.1	579.4	1,413.5	1,377.4	1,821.4
										Percentage of total venture capital disbursements									
All industries	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Biotechnology	7.1	6.4	4.6	3.9	2.3	4.1	7.0	7.4	7.1	6.1	8.0	9.7	11.2	9.5	9.9	7.7	6.8	8.1	6.1
Communications	10.6	11.7	12.2	14.0	9.4	14.8	13.2	10.0	16.3	14.9	12.2	11.4	22.4	17.5	17.8	17.3	15.5	18.6	17.1
Computer hardware	22.1	23.7	34.3	32.5	20.0	20.6	17.9	14.1	10.5	9.2	8.7	9.1	5.3	3.2	5.0	6.1	4.0	3.6	3.3
Consumer related	7.1	10.8	5.5	7.4	33.2	7.2	11.1	17.0	14.5	15.4	11.5	13.7	7.2	12.9	15.2	12.5	11.3	8.5	7.1
Industrial/energy	21.1	18.6	13.0	7.7	6.2	12.6	6.9	7.8	6.5	7.7	6.3	6.4	3.5	3.4	4.2	6.2	3.9	3.4	2.4
Medical/health	7.0	6.8	6.2	7.8	6.3	9.4	8.4	11.3	11.0	17.3	15.4	13.0	16.8	12.6	17.8	16.1	12.9	15.0	13.6
Semiconductors/other electronics	12.1	11.3	11.7	9.7	8.9	12.8	10.9	10.2	8.1	6.1	7.7	7.6	4.7	3.3	5.1	5.8	5.4	5.5	5.2
Software and services	2.7	3.4	8.1	10.5	9.3	11.8	10.7	10.2	8.4	8.8	17.4	17.7	13.1	27.1	16.4	18.6	25.9	27.1	34.3
Other products/services	10.2	7.4	4.4	6.6	4.4	6.6	13.8	12.0	17.7	14.5	12.8	11.4	15.8	10.4	8.6	9.7	14.3	10.2	10.9

SOURCE: Special tabulations provided by Venture Economics; Newark, NJ; 1999.

See figure 7-25 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 7-15.
U.S. venture capital disbursements, by financing stage: 1980–98

Financing stage	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
									Millions of U.S. dollars disbursed										
Total disbursements	**703.3**	**1,559.4**	**1,901.9**	**3,650.7**	**5,292.8**	**3,768.9**	**4,685.7**	**4,888.2**	**5,602.9**	**5,834.5**	**3,868.9**	**2,874.9**	**5,229.4**	**5,236.0**	**5,187.8**	**5,945.5**	**9,897.4**	**13,558.3**	**16,777.6**
Sutotal, early stage disbursements[a]	336.2	686.8	714.1	1,396.0	1,446.4	1,080.4	1,491.2	1,415.8	1,469.7	1,416.2	1,147.7	825.8	1,185.9	2,100.0	1,581.4	2,143.1	2,658.4	3,372.6	4,700.2
Seed	11.0	47.7	63.1	111.4	129.7	103.9	117.6	122.0	144.4	184.8	124.6	88.0	158.2	314.2	236.7	312.5	376.8	629.3	717.1
Startup	159.2	296.5	293.5	443.7	558.2	435.8	746.2	529.9	543.7	441.6	293.8	171.3	448.1	412.6	641.1	901.6	732.8	525.0	974.5
Other early stage disbursements	166.0	342.6	357.4	840.9	758.5	540.7	627.3	763.9	781.5	789.8	729.3	566.5	579.7	1,373.2	703.7	928.9	1,548.8	2,218.3	3,008.6
Subtotal, later stage disbursements[b]	367.0	872.6	1,187.8	2,254.8	3,846.4	2,688.5	3,194.6	3,472.4	4,133.2	4,418.3	2,721.2	2,049.1	4,043.5	3,136.0	3,606.4	3,802.5	7,239.0	10,185.7	12,077.4
Expansion	251.2	540.1	915.6	1,667.5	1,776.6	1,939.8	1,911.1	2,168.6	2,228.5	2,316.9	1,942.6	1,536.4	2,959.3	2,366.4	2,226.7	2,836.6	4,973.4	7,486.9	9,340.2
Acquisition	8.4	12.8	23.4	38.4	38.4	106.7	171.1	266.5	459.6	405.4	246.8	105.0	532.0	216.5	151.4	317.0	486.4	520.8	918.4
Leveraged buyout	61.0	249.3	75.9	361.4	1,780.0	389.7	746.0	452.2	1,023.5	1,388.7	152.8	58.5	153.5	223.5	545.9	218.9	621.6	984.8	586.9
Other later stage disbursements	46.4	70.4	172.9	187.4	251.4	252.4	366.3	585.1	421.6	307.2	379.1	349.3	398.7	329.6	682.4	429.9	1,157.5	1,193.2	1,231.9
									Percentage of total venture capital disbursements										
Total disbursements	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Subtotal, early stage disbursements[a]	47.8	44.0	37.5	38.2	27.3	28.7	31.8	29.0	26.2	24.3	29.7	28.7	22.7	40.1	30.5	36.0	26.9	24.9	28.0
Seed	1.6	3.1	3.3	3.1	2.5	2.8	2.5	2.5	2.6	3.2	3.2	3.1	3.0	6.0	4.6	5.3	3.8	4.6	4.3
Startup	22.6	19.0	15.4	12.2	10.5	11.6	15.9	10.8	9.7	7.6	7.6	6.0	8.6	7.9	12.4	15.2	7.4	3.9	5.8
Other early stage disbursements	23.6	22.0	18.8	23.0	14.3	14.3	13.4	15.6	13.9	13.5	18.8	19.7	11.1	26.2	13.6	15.6	15.6	16.4	17.9
Subtotal, later stage disbursements[b]	52.2	56.0	62.5	61.8	72.7	71.3	68.2	71.0	73.8	75.7	70.3	71.3	77.3	59.9	69.5	64.0	73.1	75.1	72.0
Expansion	35.7	34.6	48.1	45.7	33.6	51.5	40.8	44.4	39.8	39.7	50.2	53.4	56.6	45.2	42.9	47.7	50.2	55.2	55.7
Acquisition	1.2	0.8	1.2	1.1	0.7	2.8	3.7	5.5	8.2	6.9	6.4	3.7	10.2	4.1	2.9	5.3	4.9	3.8	5.5
Leveraged buyout	8.7	16.0	4.0	9.9	33.6	10.3	15.9	9.3	18.3	23.8	3.9	2.0	2.9	4.3	10.5	3.7	6.3	7.3	3.5
Other later stage disbursements	6.6	4.5	9.1	5.1	4.7	6.7	7.8	12.0	7.5	5.3	9.8	12.1	7.6	6.3	13.2	7.2	11.7	8.8	7.3

[a]Early stage disbursements include seed, startup, and other early stage disbursements.

[b]Later stage disbursements include expansion, acquisition, leveraged buyout, and other later stage disbursements (bridge, special situation, turnaround, secondary purchase, and public market disbursements).

SOURCE: Venture Economics; Newark, NJ; 1999.

See figure 7-26 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 7-16.
U.S. venture capital disbursements as seed money, by industry category: 1980–98

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Millions of U.S. dollars disbursed																			
Seed stage																			
All Industries	11	48	63	111	130	104	118	122	144	185	125	88	158	314	237	313	377	629	717
Biotechnology	1	2	2	5	10	6	14	16	26	53	8	7	50	45	47	9	42	68	86
Communications	2	6	13	18	18	4	9	11	15	19	14	3	23	87	26	26	26	97	153
Computer hardware	6	15	17	14	30	11	2	17	14	14	14	15	4	17	6	39	15	15	21
Consumer related	0	0	1	1	1	3	16	16	6	14	13	1	10	16	46	40	7	40	17
Industrial/energy	0	5	5	4	2	17	7	6	18	9	1	0	4	26	27	4	10	6	2
Medical/health	1	8	4	17	15	17	39	27	33	37	32	34	38	55	44	88	80	125	144
Semiconductors/ other electronics	0	10	10	16	20	14	16	15	11	8	12	2	4	11	11	23	41	27	30
Software and services	2	1	10	32	27	18	6	12	16	21	30	18	24	47	30	73	151	223	230
Other products/services	0	0	1	4	6	14	8	3	4	8	1	9	2	11	1	11	6	28	34
Percentage of total venture capital seed disbursements																			
All Industries	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Biotechnology	10	5	2	5	8	6	12	13	18	29	6	8	32	14	20	3	11	11	12
Communications	14	12	21	16	14	3	8	9	11	10	11	4	15	28	11	8	7	15	21
Computer hardware	54	32	27	13	23	11	2	14	10	8	12	17	2	5	3	13	4	2	3
Consumer related	0	0	2	1	1	3	14	13	4	8	11	1	6	5	19	13	2	6	2
Industrial/energy	4	11	8	4	2	16	6	5	13	5	1	0	3	8	11	1	3	1	0
Medical/health	5	17	6	15	12	17	33	22	23	20	25	38	24	18	18	28	21	20	20
Semiconductors/ other electronics	0	22	16	14	16	14	14	12	8	4	10	2	3	3	4	7	11	4	4
Software and services	14	2	15	29	21	17	5	10	11	11	24	20	15	15	12	23	40	35	32
Other products/services	0	0	2	4	5	14	7	2	3	5	1	11	1	3	0	3	1	4	5

SOURCE: Venture Economics, Inc.; Newark, NJ, 1999.

Appendix table 8-1.
Level of public interest in selected policy issues: 1979–99 (selected years)

Issue	1979			1981			1983			1985			1988			1990			1992			1995			1997			1999		
	VI	MI	NI	VI	MI	NI	VI	MI	NI	VI	MI	NI	VI	MI	NI	VI	MI	NI	VI	MI	NI	VI	MI	NI	VI	MI	NI	VI	MI	NI
New medical discoveries	-	-	-	-	-	-	-	-	-				68	29	3	72	25	3	68	29	3	66	31	3	69	27	4	70	26	4	68	28	4
Local school issues	38	37	25	46	36	18	46	36	18	47	39	13	51	33	15	50	34	16	53	35	12	57	31	13	58	30	11	54	34	12
Environmental pollution	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	64	31	5	59	36	5	53	41	6	52	40	8	51	41	8
Issues about new scientific discoveries	36	49	14	37	45	17	48	40	11	44	44	12	43	46	12	39	48	12	36	49	15	44	45	11	49	42	8	45	43	11
Military and defense policy	-	-	-	-	-	-	43	42	15	47	42	11	47	42	11	55	35	10	47	43	10	37	46	17	35	48	17	42	44	14
Economic issues and business conditions	35	48	17	52	37	10	57	33	10	48	41	11	48	42	10	50	40	10	56	36	8	47	42	11	47	42	11	42	45	13
The use of new inventions and technologies	33	51	15	33	50	16	42	45	12	39	49	12	40	48	12	39	49	12	37	53	10	43	46	11	47	43	10	41	48	10
International and foreign policy issues	22	53	24	35	47	18	30	47	22	33	51	16	33	50	16	48	40	12	38	47	15	21	53	26	22	50	28	30	47	23
The use of nuclear energy to generate electricity[a]	-	-	-	-	-	-	-	-	-				38	46	16	42	44	14	32	49	18	29	49	21	29	49	21	30	51	19
Space exploration	-	-	-	25	44	31	27	45	28	29	46	25	34	44	22	26	48	26	22	50	28	25	49	26	32	45	22	28	46	25
Agricultural and farm issues	23	49	28	24	47	28	-	-	-	30	48	22	40	45	15	24	48	28	-	-	-	21	53	26	24	50	26	22	50	28
Sample size	1,635			3,195			1,631			2,005			2,041			2,033			2,001			2,006			2,000			1,882		

VI = very interested; MI = moderately interested; NI = not interested; - = not asked

NOTES: Responses are to the statement: "There are a lot of issues in the news, and it is hard to keep up with every area. I'm going to read to you a short list of issues, and for each one- as I read it- I would like you to tell me if you are very interested, moderately interested, or not at all interested. "Don't know" responses are not included. Percentages may not total 100 because of rounding.

[a]In 1990, 1992, 1995, 1997, and 1999, the question was worded "...issues about the use of nuclear energy to generate electricity." In 1988, the question was worded "...issues about the use of nuclear power to generate electricity."

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, *Public Attitudes Toward Science and Technology, 1979- 1999, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-4 in Volume 1.

Appendix table 8-2.
Level of public interest in selected policy issues: 1979–99 (selected years)
(Mean index scores)

	1979	1981	1983	1985	1988	1990	1992	1995	1997	1999
New medical discoveries	-	-	-	83	85	83	82	83	83	82
Environmental pollution	-	-	-	-	-	80	77	74	72	71
Local school issues	57	64	64	67	68	67	71	72	73	71
Issues about new scientific discoveries	61	60	68	66	66	63	61	67	70	67
The use of new inventions and technologies	59	58	65	64	64	64	64	66	69	65
Economic issues and business conditions	59	71	74	69	69	70	74	68	68	65
Military and defense policy	-	-	64	68	70	73	68	60	59	64
International and foreign policy issues	49	59	54	59	58	68	62	48	47	53
The use of nuclear energy to generate electricity[a]	-	-	-	-	61	64	57	54	54	55
Space exploration	-	47	50	52	56	50	47	50	55	51
Agricultural and farm issues	48	48	-	54	63	48	-	47	49	47
Sample size	1,635	3,195	1,631	2,005	2,041	2,033	2,001	2,006	2,000	1,882

- = not asked

NOTE: Respondents were read the following statement: "There are a lot of issues in the news, and it is hard to keep up with every area. I'm going to read you a short list of issues, and for each one- as I read it- I would like you to tell me if you are very interested, moderately interested, or not at all interested." Responses were converted to a 0-100 scale by assigning a value of 100 for a "very interested" response, a value of 50 for a "moderately interested" response, and a value of 0 for a "not at all interested" response. Indices were obtained by adding all the values for each policy issue and taking the average.

[a]In 1990, 1992, 1995, 1997, and 1999, the question was worded "... issues about the use of nuclear energy to generate electricity." In 1988, the question was worded "...issues about the use of nuclear power to generate electricity."

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, *Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figure 8-1 in Volume 1.

Appendix table 8-3.
Level of public interest in selected policy issues, by sex and level of education: 1999
(Mean index scores)

Sex and level of education	New medical discoveries	Environmental pollution	Local school issues	Issues about new scientific discoveries	The use of new inventions and technologies	Economic issues and business conditions	Military and defense policy	International and foreign policy issues	The use of nuclear energy to generate electricity	Space exploration	Agricultural and farm issues	Sample size
All adults	82	71	71	67	65	65	64	53	55	51	47	1,882
Sex												
Male	77	69	65	70	72	69	68	59	58	59	45	900
Female	87	74	75	64	59	61	60	48	52	44	48	982
Formal education												
Less than high school	81	68	67	56	56	57	59	43	59	41	50	403
High school graduate	82	72	73	67	66	64	64	52	52	51	46	1,111
Baccalaureate degree	82	71	66	76	74	73	67	67	58	61	45	239
Graduate/professional degree	86	77	70	83	74	76	70	76	54	66	44	129
Science/mathematics education[a]												
Low	82	70	72	61	60	62	63	49	55	44	50	1,051
Middle	82	71	70	71	69	67	64	55	53	56	39	480
High	83	75	67	80	76	71	65	65	56	65	46	351

NOTES: Respondents were read the following statement: "There are a lot of issues in the news, and it is hard to keep up with every area. I'm going to read you a short list of issues, and for each one- as I read it- I would like you to tell me if you are very interested, moderately interested, or not at all interested." Responses were converted to a 0-100 scale by assigning a value of 100 for a "very interested" response, a value of 50 for a "moderately interested" response, and a value of 0 for a "not at all interested" response. Indices were obtained by adding all the values for each policy issue and taking the average.

[a]Respondents were classified as having a "high" level of science/mathematics education if they took nine or more high school and college science/math courses. They were classified as "middle" if they took six to eight such courses, and as "low" if they took five or fewer.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, *Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figure 8-2 in Volume 1.

Appendix table 8-4.
How well informed Americans think they are about selected policy issues: 1979–99 (selected years)
(Percentages)

Issue	1979			1981			1983			1985			1988			1990			1992			1995			1997			1999		
	VI	MI	NI	VI	MI	NI	VI	MI	NI	VI	MI	NI	VI	MI	NI	VI	MI	NI	VI	MI	NI	VI	MI	NI	VI	MI	NI	VI	MI	NI
Local school issues	20	48	32	32	45	22	34	41	25	30	47	22	33	44	23	32	46	21	32	46	22	36	46	18	38	44	17	35	47	18
New medical discoveries	-	-	-	-	-	-	-	-	-	24	57	18	22	59	19	24	57	20	22	58	21	23	57	20	28	56	16	25	56	19
Economic issues and business conditions	14	55	31	29	51	20	28	52	20	22	51	26	22	55	22	25	55	20	29	54	17	25	53	22	25	51	24	23	53	24
Military and defense policy	-	-	-	-	-	-	21	50	29	21	48	31	17	51	32	26	51	23	24	51	25	17	47	36	18	42	40	21	46	33
Environmental pollution	-	-	-	-	-	-	-	-	-	-	-	-				32	55	13	29	56	15	24	56	20	23	55	21	21	54	25
Issues about new scienctific discoveries	10	52	37	13	49	38	13	53	34	13	59	27	14	55	31	14	55	31	12	54	34	13	58	29	19	58	23	17	56	28
The use of new inventions and technologies	10	50	39	11	48	40	14	55	32	12	54	34	12	51	36	11	53	35	10	56	33	12	55	33	16	56	28	17	53	30
International and foreign policy issues	8	54	37	17	54	28	14	51	35	15	53	32	14	55	31	22	57	22	19	54	26	10	52	37	10	52	38	14	52	34
Space exploration	-	-	-	14	46	40	13	52	34	16	52	32	13	52	34	11	51	38	9	48	44	9	48	43	16	50	34	13	48	40
The use of nuclear energy to generate electricity[a]	-	-	-	-	-	-	-	-	-	-	-	-	13	47	39	12	50	38	10	43	46	9	40	51	10	41	49	11	35	54
Agricultural and farm issues	10	44	45	14	42	44	-	-	-	17	47	35	20	52	27	13	46	42	-	-	-	11	47	42	13	49	38	11	43	45
Sample size	1,635			3,195			1,631			2,005			2,041			2,033			2,001			2,006			2,000			1,882		

VI = very well informed; MI = moderately well informed; NI = poorly informed; - = not asked

NOTES: Responses are to the statement: "Now I'd like to go through this list with you again, and for each issue I'd like you to tell me if you are very well informed, moderately well informed, or poorly informed." "Don't know" responses are not included. Percentages may not total 100 because of rounding.

[a]In 1990, 1992, 1995, 1997, and 1999, the question was worded "... issues about the use of nuclear energy to generate electricity." In 1988, the question was worded "... issues about the use of nuclear power to generate electricity."

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, *1979-1999*, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-7 in Volume 1.

Appendix table 8-5.
How well informed Americans think they are about selected policy issues: 1979–99 (selected years)
(Mean index scores)

	1979	1981	1983	1985	1988	1990	1992	1995	1997	1999
Local school issues	44	55	54	54	55	55	55	59	61	58
New medical discoveries	-	-	-	53	52	53	51	52	56	53
Economic issues and business conditions	42	55	54	48	50	53	56	52	51	50
Environmental pollution	-	-	-	-	-	60	57	52	51	48
Issues about new scientific discoveries	36	38	40	43	42	42	39	42	48	44
Military and defense policy	-	-	46	45	43	51	49	40	39	44
The use of new inventions and technologies	35	35	42	39	38	38	38	40	44	43
International and foreign policy issues	35	44	40	42	42	51	46	36	36	40
Space exploration	-	37	39	42	39	37	33	33	41	37
Agricultural and farm issues	33	35	-	41	46	36	-	35	38	33
The use of nuclear energy to generate electricity[a]	-	-	-	-	37	37	32	29	31	29
Sample size	1,635	3,195	1,631	2,005	2,041	2,033	2,001	2,006	2,000	1,882

- = not asked

NOTE: Respondents were read the following statement: "Now, I'd like to go through this list with you again, and for each issue I'd like you to tell me if you are very well informed, moderately well informed, or poorly informed." Responses were converted to a 0-100 scale by assigning a value of 100 for a "very well informed" response, a value of 50 for a "moderately well informed" response, and a value of 0 for a "poorly informed" response. Indices were obtained by adding all the values for each policy issue and taking the average.

[a]In 1990, 1992, 1995, 1997, and 1999, the question was worded "... issues about the use of nuclear energy to generate electricity." In 1988, the question was worded "... issues about the use of nuclear power to generate electricity."

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figure 8-1 in Volume 1.

Appendix table 8-6.
How well informed Americans think they are about selected policy issues, by sex and level of education: 1999
(Mean index scores)

Sex and level of education	Local school issues	New medical discoveries	Economic issues and business conditions	Environmental pollution	Issues about new scientific discoveries	Military and defense policy	The use of new inventions and technologies	International and foreign policy issues	Space exploration	Agricultural and farm issues	The use of nuclear energy to generate electricity	Sample size
All adults	58	53	50	48	44	44	43	40	37	33	29	1,882
Sex												
Male	54	50	57	48	50	51	49	47	44	34	34	900
Female	62	56	43	48	40	38	38	34	29	32	24	982
Formal education												
Less than high school	56	52	40	47	36	42	40	35	32	40	38	403
High school graduate	60	52	49	48	44	44	42	39	36	32	26	1,111
Baccalaureate degree	54	54	60	51	54	45	48	48	41	27	26	239
Graduate/professional degree	60	63	65	52	59	50	51	54	45	27	27	129
Science/mathematics education[a]												
Low	59	53	45	47	39	44	40	36	33	37	31	1,051
Middle	60	51	53	49	46	45	44	45	38	28	25	480
High	55	58	59	52	57	44	49	46	44	26	27	351

NOTE: Respondents were read the following statement: "Now, I'd like to go through this list with you again, and for each issue I'd like you to tell me if you are very well informed, moderately well informed, or poorly informed." Responses were converted to a 0-100 scale by assigning a value of 100 for a "very well informed" response, a value of 50 for a "moderately well informed" response, and a value of 0 for a "poorly informed" response. Indices were obtained by adding all the values for each policy issue and taking the average.

[a]Respondents were classified as having a "high" level of science/mathematics education if they took nine or more high school and college science/math courses. They were classified as "middle" if they took six to eight such courses, and as "low" if they took five or fewer.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-7 in Volume 1.

Appendix table 8-7.
Public attentiveness to selected policy issues: 1979–99 (selected years)
(Percentages)

Issue	1979			1981			1983			1985			1988			1990			1992			1995			1997			1999		
	AP	IP	RP	AP	IP	RP	AP	IP	RP	AP	IP	RP	AP	IP	RP	AP	IP	RP	AP	IP	RP	AP	IP	RP	AP	IP	RP	AP	IP	RP
International and foreign policy issues	6	16	78	6	29	65	8	23	70	8	25	67	8	25	67	14	34	52	11	27	62	5	16	79	5	18	77	7	23	70
Issues about new scientific discoveries	7	29	64	9	28	63	9	40	52	8	36	56	8	34	57	8	31	61	7	29	64	7	37	56	11	38	51	8	37	55
The use of new inventions and technologies[b]	6	27	67	8	26	67	8	34	58	8	31	61	7	33	60	7	32	61	6	30	63	6	37	57	9	38	53	7	34	59
Science and technology[a]	9	37	54	12	35	54	13	48	39	12	44	45	11	42	46	11	40	49	10	40	50	10	47	43	14	46	40	12	44	44
Space exploration	-	-	-	7	18	75	7	20	73	9	20	71	8	26	66	6	20	74	5	17	78	5	20	75	8	24	68	6	22	72
The use of nuclear energy to generate electricity[b]	-	-	-	-	-	-	-	-	-	-	-	-	8	30	62	8	34	58	6	26	68	4	25	71	4	25	71	6	23	71
New medical discoveries	-	-	-	-	-	-	-	-	-	17	51	32	16	56	28	16	52	32	17	49	34	16	53	31	19	52	29	16	52	32
Environmental pollution[a]	-	-	-	-	-	-	-	-	-	-	-	-				20	43	36	18	41	41	12	40	48	12	40	48	10	41	49
Economic issues and business conditions	9	26	65	12	40	48	19	38	43	16	32	52	15	33	52	17	34	50	19	38	44	15	32	53	14	32	54	12	30	58
Agriculture	5	18	77	3	21	76	-	-	-	9	21	70	9	31	60	6	18	76	-	-	-	5	16	79	5	18	77	6	16	78
Military and defense	-	-	-	-	-	-	14	29	57	13	34	53	16	56	28	16	39	45	16	31	53	8	29	63	9	26	65	10	32	58
Sample size	1,635			3,195			1,631			2,005			2,041			2,033			2,001			2,006			2,000			1,882		

AP = attentive public; IP = interested public; RP = residual public; - = not asked

NOTES: Responses are to the statement: "There are a lot of issues in the news, and it is hard to keep up with every area. I'm going to read to you a short list of issues and for each one- as I read it- I would like you to tell me if you are interested, moderately interested, or not at all interested." "Now I'd like to go through this list with you again, and for each issue I'd like you to tell me if you are very well-informed, moderately well informed, or poorly informed." "Now let me change the topic slightly and ask you how you get information. First, how often do you read a newspaper: every day, a few times a week, once a week, or less than once a week? Are there any magazines that you read regularly, that is, most of the time? What magazine would that be? Is there another magazine that you read regularly? What magazine would that be?" Percentages may not total 100 because of rounding.

To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area.

[a]The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

[b]In 1990, 1992, 1995, 1997, and 1999, the question was worded "... issues about the use of nuclear energy to generate electricity." In 1988, the question was worded "... issues about the use of nuclear power to generate electricity."

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-9 in Volume 1.

Appendix table 8-8.
Public attentiveness to scientific and technological issues, by sex and level of education: 1999
(Percentages)

Sex and level of education	Issues about new scientific discoveries		The use of new inventions and technologies		Science/ technology[a]		New medical discoveries		Space exploration		The use of nuclear energy to generate electricity		Environmental pollution		Sample size
	AP	IP	AP	IP	AP	IP	AP	IP	AP	IP	AP	IP	AP	IP	
All adults	8	37	7	34	12	44	16	52	6	21	6	23	10	41	1,882
Sex															
Male	12	38	11	40	16	47	14	45	10	29	9	24	12	35	900
Female	5	35	4	29	7	42	18	58	3	16	4	22	9	46	982
Formal education															
Less than high school	7	28	6	28	9	33	14	55	5	18	14	27	10	39	403
High school graduate	7	37	6	34	10	46	14	53	6	22	4	21	9	42	1,111
Baccalaureate degree	13	44	10	43	16	52	20	47	9	26	5	28	12	39	239
Graduate/professional degree	18	49	13	40	23	50	32	41	11	27	6	16	21	37	129
Science/mathematics education[b]															
Low	6	32	6	30	9	40	16	53	5	19	7	24	9	41	1,051
Middle	10	40	7	37	12	47	13	53	7	23	6	22	11	40	480
High	15	46	12	43	19	54	21	47	11	30	6	22	15	39	351

AP = attentive public; IP = interested public

NOTES: Responses are to the statement: "There are a lot of issues in the news, and it is hard to keep up with every area. I'm going to read to you a short list of issues, and for each one- as I read it- I would like you to tell me if you are interested, moderately interested, or not at all interested." "Now, I'd like to go through this list with you again, and for each issue I'd like you to tell me if you are very well informed, moderately well informed, or poorly informed." "How often do you read a newspaper: everyday, a few times a week, once a week, or less than once a week?" "Are there any magazines that you read regularly, that is, most of the time? What magazine would that be? Is there another magazine that you read regularly? What magazine would that be?"

To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and that he or she regularly read a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area.

[a]The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

[b]Respondents were classified as having a "high" level of science/mathematics education if they took nine or more high school and college science/math courses. They were classified as "middle" if they took six to eight such courses, and as "low" if they took five or fewer.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figure 8-3 in Volume 1.

Appendix table 8-9.
U.S. public understanding of science vocabulary and concepts, by selected characteristics: 1999
(Percentages)

Sex and level of education	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	Size
All adults	81	71	85	66	43	46	45	33	80	45	93	51	57	75	72	49	29	13	16	11	1,882
Formal education																					
Less than high school	73	47	77	53	24	33	21	27	72	41	85	44	35	63	48	24	9	4	1	1	403
High school graduate	82	73	87	67	42	43	46	31	79	42	95	49	59	76	74	49	27	11	15	9	1,111
Baccalaureate	87	87	90	75	65	68	65	44	89	58	96	65	74	85	90	70	53	29	37	23	239
Graduate/professional	85	92	88	78	70	74	76	54	92	66	96	72	73	89	95	81	63	33	34	36	129
Science/mathematics education[a]																					
Low	74	61	82	61	30	33	34	28	76	38	91	44	50	68	60	33	13	5	7	5	1,051
Middle	88	80	90	66	51	55	52	34	80	48	96	54	59	83	83	62	39	14	22	11	480
High	89	88	90	81	71	74	71	47	92	64	97	68	72	86	94	78	63	37	36	28	351
Sex																					
Male	86	75	90	55	59	54	41	40	84	53	93	51	62	86	79	58	34	18	21	16	900
Female	76	66	82	76	29	39	49	27	76	38	94	51	52	66	66	40	24	9	12	6	982
Attentiveness to science or technology[b]																					
Attentive public	88	84	83	63	59	60	54	52	93	62	97	58	64	81	85	64	40	25	22	19	216
Interested public	82	73	87	68	48	51	51	36	84	48	94	52	63	78	77	53	33	13	20	12	836
Residual public	77	65	84	65	34	38	37	25	73	39	92	49	48	71	64	41	22	10	12	7	830

NOTES: Responses are correct for the following statements:
A = The center of the earth is very hot. (True);
B = All radioactivity is man-made. (False);
C = The oxygen we breathe comes from plants. (True);
D = It is the father's gene which decides whether the baby is a boy or a girl. (True);
E = Lasers work by focusing sound waves. (False);
F = Electrons are smaller than atoms. (True);
G = Antibiotics kill viruses as well as bacteria. (False);
H = The universe began with a huge explosion. (True);
I = The continents on which we live have been moving their location for millions of years and will continue to move in the future. (True);
J = Human beings, as we know them today, developed from earlier species of animals. (True);
K = Cigarette smoking causes lung cancer. (True)
L = The earliest humans lived at the same time as the dinosaurs. (False)
M = Radioactive milk can be made safe by boiling it. (False)
N = Which travels faster: light or sound? (Light)
O = Does the Earth go around the Sun, or does the Sun go around the Earth? (Earth around the Sun)
P = How long does it take for the Earth to go around the Sun: one day, one month, or one year? (One year)
Q = Please tell me in your own words, what is DNA?
R = Please tell me in your own words, what is a molecule?
S = Please tell me in your own words, what is the Internet?
T = Please tell me in your own words, what is radiation?

[a]Respondents were classified as having a "high" level of science/mathematics education if they took nine or more high school and college science/math courses. They were classified as "middle" if they took six to eight such courses, and as "low" if they took five or fewer.

[b]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it; and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figure 8-4 in Volume 1.

Appendix table 8-10.
Mean score on Index of Scientific Construct Understanding, by selected characteristics: 1999
(Mean index scores)

All adults	58
Formal education	
Less than high school	44
High school graduate	58
Baccalaureate	74
Graduate/professional	80
Science/mathematics education[a]	
Low	48
Middle	64
High	79
Sex	
Male	65
Female	52
Attentiveness to science or technology[b]	
Attentive public	69
Interested public	61
Residual public	53

NOTES: The Index of Scientific Construct Understanding is a composite measure of the public understanding of scientific terms and concepts. In 1999, this measure included responses to the following true and false questions: "All radioactivity is man-made"; "Electrons are smaller than atoms"; "The earliest humans lived at the same time as the dinosaurs"; "The continents on which we live have been moving their location for millions of years and will continue to move in the future." The following short-answer items were also included: "Which travels faster: light or sound?"; "Does the Earth go around the Sun, or does the Sun go around the Earth?"; "How long does it take for the Earth to go around the Sun: one day, one month, or one year?" Coded verbatim responses to open-ended questions were also included. "Please tell me, in your own words, what is DNA?"; "Please tell me, in your own words, what is a molecule?"; and "Please tell me, in your own words, what is radiation?"

[a]Respondents were classified as having a "high" level of science/mathematics education if they took nine or more high school and college science/math courses. They were classified as "middle" if they took six to eight such courses, and as "low" if they took five or fewer.

[b]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it; and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, *Public Attitudes Toward Science and Technology, 1979- 1999, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figure 8-5 in Volume 1.

Appendix table 8-11.
Public understanding of the nature of scientific inquiry, by selected characteristics: 1999

Sex & level of education	Inquiry	Scientific study	Experiment	Probability
All adults	26	21	35	55
Sex				
Male	28	20	36	59
Female	24	22	33	51
Formal Education				
Less than high school	4	6	14	31
High school graduate	26	19	34	58
Baccalaureate	51	44	60	75
Graduate/professional	53	47	64	71
Science/mathematics education[a]				
Low	13	10	20	46
Middle	34	28	47	58
High	55	48	62	78
Attentiveness to science and technology[b]				
Attentive public	30	32	40	54
Interested public	31	23	40	58
Residual public	20	17	28	53

NOTE: The level of understanding of the nature of scientific inquiry is estimated using a combination of each survey participant's responses to three questions. To be classified as understanding the nature of scientific inquiry, a respondent had to answer all the probability questions correctly *and* either provide a "theory-testing" response to the question about what it means to study something scientifically or provide a correct response to the open-ended questions about the experiment, i.e., explain why it was better to test a drug using a control group. The three questions are:

"When you read news stories, you see certain sets of words and terms. We are interested in how many people recognize certain kinds of terms, and I would like to ask you a few brief questions in that regard. First, some articles refer to the results of a scientific study. When you read or hear the term scientific study, do you have a clear understanding of what it means, a general sense of what it means, or little understanding of what it means?" If the response is "clear understanding" or "general sense": "In your own words, could you tell me what it means to study something scientifically?"

"Now, please think of this situation. Two scientists want to know if a certain drug is effective in treating high blood pressure. The first scientist wants to give the drug to 1,000 people with high blood pressure and see how many experience lower blood pressure levels. The second scientist wants to give the drug to 500 people with high blood pressure, and not give the drug to another 500 people with high blood pressure, and see how many in both groups experience lower blood pressure levels. Which is the better way to test this drug? Why is it better to test the drug this way?"

"Now think about this situation. A doctor tells a couple that their 'genetic makeup' means that they've got one in four chances of having a child with an inherited illness. Does this mean that if their first three children are healthy, the fourth will have the illness? Does this mean that if their first child has the illness, the next three will not? Does this mean that each of the couple's children will have the same risk of suffering from the illness? Does this mean that if they have only three children, none will have the illness?

[a]Respondents were classified as having a "high" level of science/mathematics education if they took nine or more high school and college science/math courses. They were classified as "middle" if they took six to eight such courses, and as "low" if they took five or fewer.

[b]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it; and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, *Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figure 8-6 in Volume 1.

Appendix table 8-12.
Responses to items included in the Index of Scientific Promise and the Index of Scientific Reservation: 1999
(Percentages)

Item	Strongly agree	Agree	Do not know	Disagree	Strongly disagree
Promise of science					
Science and technology are making our lives healthier, easier, and more comfortable	30	60	1	1	8
Most scientists want to work on things that will make life better for the average person	8	75	2	1	14
With the application of science and new technology, work will become more interesting	7	66	4	1	22
Because of science and technology, there will be more opportunities for the next generation	12	72	2	1	13
Reservations about science					
We depend too much on science and not enough on faith	12	38	5	7	38
It is not important for me to know about science in my daily life	3	13	1	21	62
Science makes our way of life change too fast	3	38	2	4	53
	B>>H	**B>H**	**B=4**	**H>B**	**H>>B**
Have the benefits of scientific research outweighed the harmful results or have the harmful results outweighed the benefits	47	27	11	10	5

B>>H = benefits strongly outweigh the harmful results; B>H = benefits outweigh the harmful results; B=H = benefits equal the harmful results; H>B = harmful results outweigh the benefits; H>>B = harmful results strongly outweigh the benefits.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, *Public Attitudes Toward Science and Technology, 1979- 1999, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999) and unpublished tabulations prepared for the Division of Science Resources Studies of the National Science Foundation.

See page 8-13 in Volume 1.

Appendix table 8-13.
Responses to and mean scores on the Attitude Toward Organized Science Scale, by selected characteristics: 1983–99 (selected years)

	1983	1985	1988	1990	1992	1995	1997	1999
Percent of public								
Agree that "science and technology are making our lives healthier, easier, and more comfortable"	84	86	87	84	85	86	89	90
Agree that "the benefits of science are greater than any harmful effects"	57	68	76	72	73	72	75	75
Disagree that "science makes our way of life change too fast"	50	53	59	60	63	60	61	57
Disagree that "we depend too much on science and not enough on faith"	43	39	43	44	45	44	48	46
Mean ATOSS score								
All adults	2.3	2.5	2.7	2.6	2.7	2.6	2.7	2.7
Formal education								
Less than high school	1.8	1.8	2.2	1.8	2.0	2.0	2.2	2.0
High school graduate	2.4	2.6	2.8	2.7	2.7	2.6	2.7	2.7
Baccalaureate	2.9	3.1	3.2	3.1	3.3	3.3	3.2	3.1
Graduate/professional	2.9	3.1	3.1	3.2	3.3	3.4	3.4	3.3
Science/mathematics education[a]								
Low	NA	NA	NA	2.4	2.5	2.3	2.5	2.4
Middle	NA	NA	NA	2.9	2.7	2.9	2.9	2.8
High	NA	NA	NA	3.3	3.3	3.2	3.3	3.3
Sex								
Male	2.2	2.4	2.6	2.5	2.7	2.7	2.9	2.8
Female	2.5	2.6	2.8	2.8	2.6	2.5	2.6	2.6
Attentiveness to science or technology[b]								
Attentive public	2.6	2.8	3.0	2.8	2.9	3.1	3.0	3.0
Interested public	2.4	2.6	2.8	2.7	2.8	2.7	2.9	2.8
Residual public	2.1	2.3	2.5	2.5	2.5	2.4	2.4	2.4
Sample size	1,631	2,005	2,041	2,033	3,977	2,006	2,000	1,882

ATOSS = Attitude Toward Organized Science Scale; NA = not available

NOTES: Responses are to the following statement: "Now I would like to read you some statements like those you might find in a newspaper or magazine article. For each statement, please tell me if you generally agree or disagree. If you feel especially strongly about a statement, please tell me that you strongly agree or strongly disagree." The scale is a count of agreement with the first two items and disagreement with the second two items.

[a]Respondents were classified as having a "high" level of science/mathematics education if they took nine or more high school and college science/math courses. They were classified as "middle" if they took six to eight such courses, and as "low" if they took five or fewer.

[b]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it; and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-13 in Volume 1.

Appendix table 8-14.
Public assessment of the impact of computers and factory automation, by selected characteristics: 1985–99 (selected years)
(Percentages)

Characteristic	1985	1988	1990	1992	1995	1997	1999
All adults							
Strongly agree	3	5	4	5	6	9	9
Agree	45	35	35	34	35	37	39
Do not know	8	8	8	6	9	7	7
Disagree	42	45	45	48	43	39	39
Strongly disagree	1	7	8	7	7	8	6
Male							
Strongly agree	4	6	5	5	8	11	13
Agree	49	37	37	35	37	41	36
Do not know	7	7	7	5	8	5	5
Disagree	39	42	44	47	40	35	40
Strongly disagree	1	8	7	8	7	8	6
Female							
Strongly agree	2	4	3	5	5	8	6
Agree	42	34	32	33	33	34	40
Do not know	10	9	9	7	9	9	9
Disagree	45	48	47	48	45	41	39
Strongly disagree	1	5	9	7	8	8	6
Less than high school graduate							
Strongly agree	3	5	4	8	8	12	10
Agree	41	28	28	31	33	38	36
Do not know	8	9	9	5	11	6	9
Disagree	46	51	51	47	40	32	38
Strongly disagree	2	7	8	9	8	12	7
High school graduate							
Strongly agree	3	4	4	4	5	8	8
Agree	43	37	34	33	33	33	38
Do not know	8	7	7	5	8	7	6
Disagree	45	45	46	50	46	44	42
Strongly disagree	1	7	9	8	8	8	6
Baccalaureate and higher							
Strongly agree	3	9	6	4	7	10	13
Agree	60	42	46	40	43	48	44
Do not know	10	8	9	9	9	6	7
Disagree	25	37	34	42	35	31	33
Strongly disagree	1	4	5	5	6	5	3
Attentive public to science and technology[a]							
Strongly agree	4	10	5	7	10	17	16
Agree	56	37	45	41	36	38	38
Do not know	7	8	5	4	9	6	4
Disagree	32	37	38	43	38	31	35
Strongly disagree	1	8	7	5	7	8	7

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 8-14.
Public assessment of the impact of computers and factory automation, by selected characteristics: 1985–99 (selected years)

Characteristic	1985	1988	1990	1992	1995	1997	1999
				Sample size			
All adults	2,005	2,041	2,033	1,004	2,006	2,000	1,882
Male	950	958	964	486	953	930	900
Female	1,054	1,084	1,070	533	1,053	1,070	982
Less than high school graduate	507	530	495	215	418	420	403
High school graduate	1,147	1,158	1,202	623	1,196	1,188	1,111
Baccalaureate and higher	349	353	336	203	392	392	368
Attentive public to science and technology	235	233	229	105	195	288	216

NOTE: Responses are to the following question: "In general, computers and factory automation will create more jobs than they will eliminate. Do you strongly agree, agree, disagree, or strongly disagree?"

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it; and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-13 in Volume 1.

Appendix table 8-15.
Public assessment that people would do better by living a simpler life, by selected characteristics: 1997, 1999

Characteristic	1997	1999
	Percentages	
All adults		
Strongly agree	6	7
Agree	37	39
Do not know	5	3
Disagree	48	48
Strongly disagree	4	3
Male		
Strongly agree	6	6
Agree	33	34
Do not know	4	4
Disagree	53	53
Strongly disagree	4	3
Female		
Strongly agree	7	6
Agree	41	45
Do not know	5	3
Disagree	44	44
Strongly disagree	3	2
Less than high school graduate		
Strongly agree	8	11
Agree	44	50
Do not know	7	5
Disagree	36	32
Strongly disagree	5	2
High school graduate		
Strongly agree	7	6
Agree	37	39
Do not know	4	3
Disagree	48	50
Strongly disagree	4	2
Baccalaureate and higher		
Strongly agree	3	2
Agree	29	27
Do not know	5	4
Disagree	59	61
Strongly disagree	4	6
Attentive public to science and technology[a]		
Strongly agree	6	8
Agree	29	28
Do not know	3	3
Disagree	54	58
All adults	2,000	1,882
Male	930	900
Female	1,070	982
Less than high school graduate	420	403
High school graduate	1,188	1,111
Baccalaureate or higher	392	368
Attentive public to science and technology	288	216

NOTE: Responses are to the question: "People would do better by living a simpler life without so much technology. Do you strongly agree, agree, disagree, or strongly disagree?"

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it; and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-13 in Volume 1.

Appendix table 8-16.
Public assessment that technological discoveries will destroy the Earth, by selected characteristics: 1997, 1999

Characteristic	1997	1999
	Percentages	
All adults		
Strongly agree	4	4
Agree	22	27
Do not know	6	5
Disagree	56	55
Strongly disagree	12	9
Male		
Strongly agree	5	5
Agree	21	24
Do not know	6	4
Disagree	53	56
Strongly disagree	15	11
Female		
Strongly agree	4	4
Agree	23	29
Do not know	7	6
Disagree	57	53
Strongly disagree	9	7
Less than high school graduate		
Strongly agree	7	8
Agree	26	35
Do not know	7	6
Disagree	48	48
Strongly disagree	12	3
High school graduate		
Strongly agree	4	4
Agree	24	27
Do not know	7	5
Disagree	56	56
Strongly disagree	9	8
Baccalaureate and higher		
Strongly agree	2	2
Agree	14	18
Do not know	4	5
Disagree	61	57
Strongly disagree	19	18
Attentive public to science and technology[a]		
Strongly agree	4	8
Agree	11	18
Do not know	6	3
Disagree	60	56
Strongly disagree	19	15

Characteristic	1997	1999
	Sample size	
All adults	2,000	1,882
Male	930	900
Female	1,070	982
Less than high school graduate	420	403
High school graduate	1,188	1,111
Baccalaureate or higher	392	368
Attentive public to science and technology	288	216

NOTE: Responses are to the question: "Technological discoveries will eventually destroy the Earth. Do you strongly agree, agree, disagree, or strongly disagree?"

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-13 in Volume 1.

Appendix table 8-17.
Public assessment that technological development creates an artificial and inhuman way of living, by selected characteristics: 1997,1999

Characteristic	1997	1999
	Percentages	
All adults		
Strongly agree	2	2
Agree	27	29
Do not know	6	6
Disagree	58	58
Strongly disagree	7	5
Male		
Strongly agree	3	2
Agree	25	26
Do not know	4	5
Disagree	60	61
Strongly disagree	8	6
Female		
Strongly agree	2	3
Agree	29	31
Do not know	7	7
Disagree	56	56
Strongly disagree	6	4
Less than high school graduate		
Strongly agree	3	5
Agree	37	40
Do not know	9	13
Disagree	43	40
Strongly disagree	8	2
High school graduate		
Strongly agree	3	2
Agree	27	28
Do not know	6	5
Disagree	60	61
Strongly disagree	4	4
Baccalaureate and higher		
Strongly agree	1	1
Agree	16	18
Do not know	3	2
Disagree	68	66
Strongly disagree	12	13
Attentive public to science and technology[a]		
Strongly agree	3	4
Agree	19	22
Do not know	1	2
Disagree	63	64
Strongly disagree	14	9

Characteristic	1997	1999
	Sample size	
All adults	2,000	1,882
Male	930	900
Female	1,070	982
Less than high school graduate	420	403
High school graduate	1,188	1,111
Baccalaureate or higher	392	368
Attentive public to science and technology	288	216

NOTE: Responses are to the question: "Technological development creates an artificial and inhuman way of living. Do you strongly agree, agree, disagree, or strongly disagree?"

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979- 1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-13 in Volume 1.

Appendix table 8-18.
General attitudes toward science and technology, by selected characteristics: 1992–99 (selected years)

Characteristic	1992			1995			1997			1999		
	P[a]	R[b]	P/R	P[a]	R[b]	P/R	P[a]	R[b]	P/R	P[a]	R[b]	P/R
	Mean											
All adults	67	38	1.76	68	39	1.74	70	37	1.89	71	38	1.87
Formal education												
Less than high school	64	49	1.31	63	51	1.24	69	45	1.53	67	50	1.34
High school graduate	67	39	1.72	68	39	1.74	69	38	1.82	71	38	1.87
Baccalaureate	70	27	2.59	71	29	2.45	74	28	2.64	74	28	2.64
Graduate/professional	71	24	2.96	73	24	3.04	75	24	3.13	75	26	2.8
Science/mathematics education[c]												
Low	66	43	1.53	67	44	1.52	69	42	1.64	69	44	1.57
Middle	67	38	1.76	69	35	1.97	71	34	2.09	72	35	2.06
High	71	24	2.96	71	28	2.54	75	27	2.78	75	26	2.89
Sex												
Female	67	38	1.76	67	40	1.68	69	39	1.77	69	40	1.73
Male	68	39	1.74	69	38	1.82	71	35	2.03	72	36	2.00
Attentiveness to science and technology[d]												
Attentive public	71	36	1.97	74	30	2.47	75	30	2.50	75	31	2.42
Interested public	70	36	1.94	69	38	1.82	73	35	2.09	73	36	2.03
Residual public	65	41	1.59	65	42	1.55	66	43	1.54	67	43	1.56

P = Promise of Science and Technology; R = Reservations about Science and Technology; P/R = Ratio of Promise Index to Reservation Index

NOTES: The Index of Scientific Promise and the Index of Scientific Reservation are factor scores converted to a 0- 100 scale. A confirmatory factor analysis verified the existence of a two factor structure. The lowest possible factor score (strong disagreement with all of the items) was set to 0, and the highest possible factor score (strong agreement with all of the items) was set to 100. All factor scores between the highest and the lowest were placed on the 0-100 metric accordingly.

[a]The Index of Scientific Promise includes responses to the following statements: "Now I would like to read you some statements like those you might find in a newspaper or magazine article. For each statement, please tell me if you generally agree or disagree. If you feel especially strongly about a statement, please tell me that you strongly agree or disagree. First, science and technology are making our lives healthier, easier, and more comfortable- do you strongly agree, agree, disagree, or strongly disagree? Most scientists want to work on things that will make life better for the average person- do you strongly agree, agree, disagree, or strongly disagree? With the application of science and new technology, work will become more interesting- do you strongly agree, agree, disagree, or strongly disagree? Because of science and technology, there will be more opportunities for the next generation- do you strongly agree, agree, disagree, or strongly disagree?"

[b]The Index of Scientific Reservation includes responses to the following statements: "Now I would like to read you some statements like those you might find in a newspaper or magazine article. For each statement, please tell me if you generally agree or disagree. If you feel especially strongly about a statement, please tell me that you strongly agree or strongly disagree. We depend too much on science and not enough on faith- do you strongly agree, agree, disagree, or strongly disagree? It is not important for me to know about science in my daily life- do you strongly agree, agree, disagree, strongly disagree? Science makes our way of life change too fast- do you strongly agree, agree, disagree, strongly disagree? Now for a different type of question. People have frequently noted that scientific research has produced both beneficial and harmful consequences. Would you say that, on balance, the benefits of scientific research have outweighted the harmful results, or have the harmful results of scientific research been greater than its benefits? *(If benefits greater):* Would you say that the balance has been strongly in favor of beneficial results, or only slightly? *(If harms greater):* Would you say that the balance has been strongly in favor of harmful results, or only slightly?"

[c]Respondents were classified as having a "high" level of science/mathematics education if they took nine or more high school and college science/math courses. They were classified as "middle" if they took six to eight such courses, and as "low" if they took five or fewer.

[d]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, *Public Attitudes Toward Science and Technology, 1979- 1999, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-15 in Volume 1.

Appendix table 8-19.
Public assessment of funding of scientific research by the Federal Government, by selected characteristics: 1985–99
(Percentages)

Characteristic	1985	1988	1990	1992	1995	1997	1999
All adults							
Strongly agree	9	16	17	14	19	22	21
Agree	70	65	62	63	61	57	61
Do not know	5	4	4	3	3	3	3
Disagree	16	14	15	18	17	15	13
Strongly disagree	0	1	2	2	2	3	2
Male							
Strongly agree	11	20	23	17	19	24	24
Agree	71	63	60	62	60	54	60
Do not know	2	2	2	2	2	3	2
Disagree	15	13	13	17	18	16	12
Strongly disagree	1	2	2	2	1	3	2
Female							
Strongly agree	8	11	13	11	15	20	18
Agree	68	68	65	64	62	59	62
Do not know	8	6	5	4	5	4	4
Disagree	16	14	16	19	16	15	14
Strongly disagree	0	1	1	2	2	2	2
Less than high school graduate							
Strongly agree	5	6	10	10	8	20	17
Agree	65	66	59	61	59	50	55
Do not know	9	7	8	5	7	5	7
Disagree	21	18	20	21	24	22	18
Strongly disagree	0	3	3	3	2	3	3
High school graduate							
Strongly agree	8	17	18	12	16	19	18
Agree	72	66	65	64	63	60	66
Do not know	4	3	2	3	3	3	2
Disagree	15	13	14	19	17	15	12
Strongly disagree	1	1	1	2	1	3	2
Baccalaureate							
Strongly agree	19	26	27	22	24	31	34
Agree	68	62	60	64	62	56	53
Do not know	2	3	2	2	2	2	1
Disagree	10	8	10	12	11	10	10
Strongly disagree	1	1	1	0	1	1	2
Graduate degree							
Strongly agree	20	29	31	26	43	40	40
Agree	70	61	58	53	46	51	51
Do not know	2	2	4	5	2	2	1
Disagree	8	7	6	14	8	5	8
Strongly disagree	0	1	1	2	1	2	0
Attentive public to science and technology[a]							
Strongly agree	17	27	35	28	35	46	35
Agree	76	62	50	61	48	42	52
Do not know	0	2	4	1	1	1	0
Disagree	6	8	10	9	14	7	9
Strongly disagree	1	1	1	1	2	4	4

NOTES: Responses are to the question: "Even if it brings no immediate benefits, scientific research which advances the frontiers of knowledge is necessary and should be supported by the Federal Government. Do you strongly agree, agree, disagree, or strongly disagree?"

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-15 in Volume 1.

Appendix table 8-20.
Percentage of adults agreeing that the Federal Government should support basic scientific research, by level of Index of Scientific Promise and the Index of Scientific Reservation: 1999

Level of index	Disagree	Unsure	Agree	Sample size
Index of Scientific Promise[a]				
All adults	15	3	82	1,882
Low (0-49)	34	5	61	217
Moderate (50-74)	20	5	75	565
High (75-100)	8	2	90	1,100
Less than high school graduate	21	7	72	403
Low (0-49)	56	9	35	68
Moderate (50-74)	24	11	65	132
High (75-100)	7	4	89	203
High school graduate	14	2	84	1,111
Low (0-49)	26	4	70	117
Moderate (50-74)	20	3	77	340
High (75-100)	8	2	90	655
Baccalaureate and higher	10	1	89	368
Low (0-49)	16	0	84	32
Moderate (50-74)	16	2	82	93
High (75-100)	7	1	92	242
Index of Scientific Reservation[b]				
All adults	15	3	82	1,882
Low (0-29)	7	1	92	732
Moderate (30-54)	17	2	81	712
High (55+)	25	7	68	438
Less than high school graduate	21	7	72	403
Low (0-29)	0	2	98	47
Moderate (30-54)	21	4	75	184
High (55+)	26	12	62	172
High school graduate	14	2	84	1,111
Low (0-29)	8	2	90	452
Moderate (30-54)	15	1	84	423
High (55+)	24	4	72	236
Baccalaureate and higher	10	1	89	368
Low (0-29)	6	1	93	233
Moderate (30-54)	17	2	81	105
High (55+)	24	0	76	30

NOTES: The Index of Scientific Promise and the Index of Scientific Reservation are factor scores converted to a 0-100 scale. A confirmatory factor analysis verified the existence of a two factor structure. The lowest possible factor score (strong disagreement with all of the items) was set to 0, and the highest possible factor score (strong agreement with all of the items) was set to 100. All factor scores between the highest and the lowest were placed on the 0-100 metric accordingly.

[a]The Index of Scientific Promise includes responses to the following statements: "Now I would like to read you some statements like those you might find in a newspaper or magazine article. For each statement, please tell me if you generally agree or disagree. If you feel especially strongly about a statement, please tell me that you strongly agree or disagree. First, science and technology are making our lives healthier, easier, and more comfortable- do you strongly agree, agree, disagree, or strongly disagree? Most scientists want to work on things that will make life better for the average person- do you strongly agree, agree, disagree, or strongly disagree? With the application of science and new technology, work will become more interesting- do you strongly agree, agree, disagree, or strongly disagree? Because of science and technology, there will be more opportunities for the next generation- do you strongly agree, agree, disagree, or strongly disagree?"

[b]The Index of Scientific Reservation includes responses to the following statements: "Now I would like to read you some statements like those you might find in a newspaper or magazine article. For each statement, please tell me if you generally agree or disagree. If you feel especially strongly about a statement, please tell me that you strongly agree or strongly disagree. We depend too much on science and not enough on faith- do you strongly agree, agree, disagree, or strongly disagree? It is not important for me to know about science in my daily life- do you strongly agree, agree, disagree, strongly disagree? Science makes our way of life change too fast- do you strongly agree, agree, disagree, strongly disagree? Now for a different type of question. People have frequently noted that scientific research has produced both beneficial and harmful consequences. Would you say that, on balance, the benefits of scientific research have outweighted the harmful results, or have the harmful results of scientific research been greater than its benefits? *(If benefits greater):* Would you say that the balance has been strongly in favor of beneficial results, or only slightly? *(If harms greater):* Would you say that the balance has been strongly in favor of harmful results, or only slightly?"

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figure 8-8 in Volume 1.

Appendix table 8-21.
Public preferences for government spending: 1981–99 (selected years)
(Percentages)

Policy issue		1981	1983	1985	1988	1990	1992	1997	1999
Exploring space	Too little	18	17	9	17	9	12	14	15
	Too much	43	39	45	42	52	50	45	46
Reducing pollution	Too little	52	54	69	76	76	72	65	65
	Too much	14	11	6	4	5	7	8	7
Improving health care	Too little	61	-	68	68	75	79	68	71
	Too much	6	-	3	2	3	5	7	5
Supporting scientific research	Too little	31	-	29	34	30	34	34	37
	Too much	18	-	18	15	16	19	14	14
Improving education	Too little	62	71	73	76	77	81	76	75
	Too much	6	5	3	4	4	4	6	6
Helping older people	Too little	73	-	72	76	75	73	66	71
	Too much	3	-	3	2	2	4	5	4
Improving national defense[a]	Too little	33	19	11	11	15	15	23	31
	Too much	26	47	50	53	40	40	32	25
Helping low-income persons	Too little	45	-	54	55	57	56	44	49
	Too much	24	-	13	12	15	17	23	19
Sample size		1,659	1,631	2,005	2,041	2,033	2,001	2,000	1,882

- = not asked

NOTE: Responses are to the following question: "We are faced with many problems in this country. I'm going to name some of these problems, and for each one, I'd like you to tell me if you think that the government is spending too little money on it, about the right amount, or too much."

[a]The "improving national defense" question was asked on a split ballot in 1988 therefore, the N for that item only is 1,013.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, *Public Attitudes Toward Science and Technology, 1979- 1999, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-17 in Volume 1.

Appendix table 8-22.
Public preferences for government spending, by selected characteristics: 1999

Characteristic	Exploring space	Reducing pollution	Improving health care	Supporting scientific research	Improving education	Helping older people	Improving national defense	Helping low-income persons
All adults								
Too little	15	65	71	37	75	71	31	49
About the right amount	36	25	22	43	18	23	40	30
Too much	46	7	5	14	6	4	25	19
Do not know	3	3	2	6	1	2	4	2
Male								
Too little	21	64	66	39	70	65	33	50
About the right amount	40	26	26	44	21	26	39	29
Too much	37	8	7	13	7	6	26	19
Do not know	2	2	1	4	2	3	2	2
Female								
Too little	9	66	75	35	79	76	29	49
About the right amount	32	24	18	42	15	20	41	30
Too much	54	5	4	15	5	2	24	19
Do not know	5	5	3	8	1	2	6	2
Less than high school graduate								
Too little	12	62	72	35	70	73	35	70
About the right amount	23	23	22	37	22	21	33	24
Too much	58	9	3	20	6	4	22	4
Do not know	7	6	3	8	2	2	10	2
High school graduate								
Too little	14	66	72	35	77	74	31	45
About the right amount	36	26	21	44	17	21	42	30
Too much	47	6	6	15	5	3	25	23
Do not know	3	2	1	6	1	2	2	2
Baccalaureate and higher								
Too little	18	65	66	45	74	60	27	41
About the right amount	49	24	25	43	17	32	44	35
Too much	30	8	7	6	8	5	27	22
Do not know	3	3	2	6	1	3	2	2
Attentive public to science and technology[a]								
Too little	25	68	70	44	76	67	36	54
About the right amount	39	19	20	38	16	26	39	27
Too much	36	12	9	16	8	5	22	18
Do not know	0	1	1	2	0	2	3	1

NOTE: Responses are to the following question: "We are faced with many problems in this country. I'm going to name some of these problems, and for each one, I'd like you to tell me if you think that the government is spending too little money on it, about the right amount, or too much."

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, *Public* Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-17 in Volume 1.

Appendix table 8-23.
Public confidence in the people running various institutions: 1973–98
(Percentages)

	1973	1974	1975	1976	1977	1978	1980	1982	1983	1984	1986	1987	1988	1989	1990	1991	1993	1994	1996	1998
Medicine	54	60	50	54	51	46	52	45	51	50	46	52	51	46	46	48	39	41	45	44
Scientific community	37	45	39	43	41	36	41	38	41	44	39	45	39	40	37	41	37	38	39	40
U.S. Supreme Court	31	33	31	35	35	28	25	30	27	33	30	36	35	34	35	37	31	30	28	37
Military	32	40	35	39	36	29	28	31	29	36	31	34	34	32	33	60	42	37	37	36
Education	37	49	31	37	41	28	30	33	29	28	28	35	29	30	27	30	22	25	23	27
Major companies	29	31	19	22	27	22	27	23	24	30	24	30	25	24	25	20	21	25	23	26
Organized religion	35	44	24	30	40	31	35	32	28	31	25	29	20	22	23	25	23	24	25	27
Executive branch of the Federal Government	29	14	13	13	28	12	12	19	13	18	21	18	16	20	23	26	12	11	10	14
Banks and financial institutions	-	-	32	39	42	33	32	27	24	31	21	27	27	19	18	12	15	18	25	26
Congress	23	17	13	14	19	13	9	13	10	12	16	16	15	17	15	18	7	8	8	11
Press	23	26	24	28	25	20	22	18	13	17	18	18	18	17	15	16	11	8	11	9
TV	18	23	18	19	17	14	16	14	12	13	15	12	14	14	14	14	12	9	10	10
Organized labor	15	18	10	12	15	11	15	12	8	8	8	10	10	9	11	11	8	10	11	11
Average[a]	30	33	26	29	31	24	26	26	24	27	25	28	26	25	25	29	22	22	23	24
Sample size	1,504	1,484	1,490	1,499	1,530	1,532	1,468	1,506	1,599	989	1,470	1,466	997	1,035	899	1,017	1,057	2,011	1,925	1,911

- = not asked

NOTES: Percentages represent those respondents expressing a "great deal of confidence" when asked the following: "I am going to name some institutions in this country. As far as the people running these institutions are concerned, would you say that you have a great deal of confidence, only some confidence, or hardly any confidence at all in them?" The survey was not conducted in 1979 and 1981, and the question was not asked in 1985.

[a]Average does not include banks and financial institutions.

SOURCE: J.A. Davis and T.W. Smith, *General Social Surveys, Cumulative Codebook* (Chicago: University of Chicago, National Opinion Research Center, annual series).

See figure 8-9 in Volume 1.

Science & Engineering Indicators - 2000

Appendix table 8-24.
Public assessment of scientific research, by selected characteristics: 1979–99 (selected years)

Characteristic	1979	1981	1985	1988	1990	1992	1995	1997	1999
					Percent				
All adults									
Benefits strongly outweigh harmful results	46	42	44	57	47	42	43	47	47
Benefits slightly outweigh harmful results	24	28	24	25	25	31	29	28	27
Benefits equal harmful results	19	13	13	5	15	11	16	13	11
Harmful results slightly outweigh benefits	7	12	13	9	10	12	10	8	10
Harmful results strongly outweigh benefits	4	5	6	4	3	4	3	4	5
Male									
Benefits strongly outweigh harmful results	51	48	48	59	54	45	47	52	50
Benefits slightly outweigh harmful results	23	27	23	25	24	30	28	27	27
Benefits equal harmful results	16	11	10	5	9	9	13	10	9
Harmful results slightly outweigh benefits	7	10	13	7	9	11	9	7	10
Harmful results strongly outweigh benefits	3	5	6	4	4	5	4	4	4
Female									
Benefits strongly outweigh harmful results	42	37	40	55	40	40	39	42	45
Benefits slightly outweigh harmful results	25	28	26	25	26	31	30	29	28
Benefits equal harmful results	23	16	14	6	20	13	19	15	12
Harmful results slightly outweigh benefits	6	14	14	10	11	12	10	10	10
Harmful results strongly outweigh benefits	4	5	6	4	3	4	3	4	5
Less than high school graduate									
Benefits strongly outweigh harmful results	26	26	20	37	24	24	18	30	25
Benefits slightly outweigh harmful results	25	23	21	30	25	33	30	28	25
Benefits equal harmful results	32	25	26	9	30	17	34	21	18
Harmful results slightly outweigh benefits	12	18	20	17	17	20	14	18	22
Harmful results strongly outweigh benefits	5	9	13	7	4	7	3	3	10
High school graduate									
Benefits strongly outweigh harmful results	50	43	47	59	49	41	44	46	47
Benefits slightly outweigh harmful results	26	31	26	25	27	32	30	30	31
Benefits equal harmful results	16	10	10	5	11	10	13	13	10
Harmful results slightly outweigh benefits	5	12	13	7	10	12	10	6	8
Harmful results strongly outweigh benefits	3	4	4	4	3	5	3	5	4
Baccalaureate and higher									
Benefits strongly outweigh harmful results	69	64	67	80	72	66	67	67	71
Benefits slightly outweigh harmful results	18	22	23	16	18	22	23	23	19
Benefits equal harmful results	8	7	2	1	6	8	6	6	5
Harmful results slightly outweigh benefits	2	4	6	2	2	3	3	3	4
Harmful results strongly outweigh benefits	3	2	2	1	2	2	1	1	1
Attentive public to science and technology[a]									
Benefits strongly outweigh harmful results	67	63	59	62	61	48	64	64	61
Benefits slightly outweigh harmful results	16	20	17	23	19	27	21	19	21
Benefits equal harmful results	8	5	7	6	10	12	8	6	5
Harmful results slightly outweigh benefits	4	8	13	6	6	9	3	8	11
Harmful results strongly outweigh benefits	5	4	4	3	4	4	4	3	2
					Sample size				
All adults	1,635	1,536	2,005	975	2,033	997	2,006	2,000	1,882
Male	773	724	950	475	964	464	953	930	900
Female	862	812	1,054	500	1,070	533	1,053	1,070	982
Less than high school graduate	465	385	507	259	495	215	418	420	403
High school graduate	932	886	1,147	546	1,202	579	1,196	1,188	1,111
Baccalaureate and higher	238	264	349	170	336	203	392	392	368
Attentive public to science and technology[a]	154	381	235	116	229	94	195	288	216

NOTES: Responses are for the following statements: "People have frequently noted that scientific research has produced both beneficial and harmful consequences. Would you say that, on balance, the benefits of scientific research have outweighed the harmful results, or have the harmful results of scientific research been greater than its benefits? Would you say that the balance has been strongly in favor of beneficial results or only slightly? Would you say that the balance has been strongly in favor of harmful results or only slightly?" Percentages may not total 100 because of rounding.

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figure 8-10 in Volume 1.

Appendix table 8-25.
Public assessment of nuclear power, by selected characteristics: 1985–99 (selected years)

Characteristic	1985	1988	1990	1992	1995	1997	1999
	Percent						
All adults							
Benefits strongly outweigh harmful results	28	18	24	17	21	22	24
Benefits slightly outweigh harmful results	22	24	23	30	22	23	24
Benefits equal harmful results	6	11	12	11	14	18	15
Harmful results slightly outweigh benefits	13	17	13	15	21	17	20
Harmful results strongly outweigh benefits	31	30	28	27	21	20	17
Male							
Benefits strongly outweigh harmful results	38	23	31	21	29	28	30
Benefits slightly outweigh harmful results	22	27	24	34	23	26	29
Benefits equal harmful results	4	7	8	7	8	13	7
Harmful results slightly outweigh benefits	9	15	11	10	21	13	20
Harmful results strongly outweigh benefits	27	28	26	28	19	20	14
Female							
Benefits strongly outweigh harmful results	19	14	17	14	14	17	18
Benefits slightly outweigh harmful results	22	21	21	27	21	20	21
Benefits equal harmful results	8	14	16	14	20	22	21
Harmful results slightly outweigh benefits	16	19	16	18	23	20	21
Harmful results strongly outweigh benefits	35	32	30	27	22	21	19
Less than high school graduate							
Benefits strongly outweigh harmful results	28	15	21	10	15	20	22
Benefits slightly outweigh harmful results	24	25	21	37	16	17	21
Benefits equal harmful results	8	17	23	11	25	25	22
Harmful results slightly outweigh benefits	14	19	13	13	28	21	20
Harmful results strongly outweigh benefits	26	24	22	29	16	17	15
High school graduate							
Benefits strongly outweigh harmful results	27	18	23	19	21	22	24
Benefits slightly outweigh harmful results	21	23	23	26	23	23	24
Benefits equal harmful results	6	9	9	11	13	16	13
Harmful results slightly outweigh benefits	13	17	14	16	21	16	21
Harmful results strongly outweigh benefits	33	33	31	28	23	23	18
Baccalaureate and higher							
Benefits strongly outweigh harmful results	29	22	32	19	28	25	28
Benefits slightly outweigh harmful results	21	25	23	34	26	26	29
Benefits equal harmful results	3	7	7	10	8	14	11
Harmful results slightly outweigh benefits	13	14	13	14	18	17	18
Harmful results strongly outweigh benefits	3	32	25	23	19	18	14
Attentive public to science and technology[a]							
Benefits strongly outweigh harmful results	35	26	30	24	28	25	26
Benefits slightly outweigh harmful results	20	24	27	30	24	25	30
Benefits equal harmful results	1	9	6	10	10	11	11
Harmful results slightly outweigh benefits	12	16	9	9	22	17	18
Harmful results strongly outweigh benefits	32	25	28	27	18	22	15

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 8-25.
Public assessment of nuclear power, by selected characteristics: 1985–99 (selected years)

Characteristic	1985	1988	1990	1992	1995	1997	1999
				Sample size			
All adults	2,005	2,041	2,033	997	2,006	2,000	1,882
Male	950	958	964	464	953	930	900
Female	1,054	1,084	1,070	533	1,053	1,070	982
Less than high school graduate	507	530	495	215	418	420	403
High school graduate	1,143	1,158	1,202	579	1,196	1,188	1,111
Baccalaureate and higher	349	353	336	203	392	392	368
Attentive public to science and technology[a]	235	233	229	94	195	288	216

NOTES: In 1985, 1988, 1990, 1995, 1997, and 1999, the question was worded, "In the current debate over the use of nuclear reactors to generate electricity, there is a broad agreement that there are some risks and some benefits associated with nuclear power. In your opinion, have the benefits associated with nuclear power outweighed the harmful results, or have the harmful results associated with nuclear power been greater than its benefits? Would you say that the balance has been strongly in favor of beneficial results or only slightly? Would you say that the balance has been strongly in favor of harmful results or only slightly?" In 1992, the question was worded, "In the current debate over the use of nuclear reactors to generate electricity, there is broad agreement that there are some costs and some benefits associated with nuclear power. In your opinion, are the costs associated with nuclear power greater than the benefits, or are the benefits associated with nuclear power greater than the costs? Would you say that the benefits have substantially exceeded the costs or only slightly exceeded the costs? Would you say that the costs substantially exceeded the benefits or only slightly exceeded the benefits?" Percentages may not total 100 because of rounding.

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it; and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figure 8-11 in Volume 1.

Appendix table 8-26.
Public assessment of genetic engineering, by selected characteristics: 1985–99 (selected years)

Characteristic	1985	1990	1995	1997	1999
	Percent				
All adults					
Benefits strongly outweigh harmful results	23	20	21	19	20
Benefits slightly outweigh harmful results	26	27	22	23	24
Benefits equal harmful results	12	16	22	22	18
Harmful results slightly outweigh benefits	14	19	23	20	22
Harmful results strongly outweigh benefits	25	18	12	16	16
Male					
Benefits strongly outweigh harmful results	26	21	24	23	24
Benefits slightly outweigh harmful results	28	31	22	26	26
Benefits equal harmful results	11	14	21	20	17
Harmful results slightly outweigh benefits	13	18	22	17	21
Harmful results strongly outweigh benefits	22	16	10	14	12
Female					
Benefits strongly outweigh harmful results	19	19	18	16	16
Benefits slightly outweigh harmful results	25	23	22	21	22
Benefits equal harmful results	14	17	22	23	20
Harmful results slightly outweigh benefits	15	21	23	22	22
Harmful results strongly outweigh benefits	27	20	15	18	20
Less than high school graduate					
Benefits strongly outweigh harmful results	19	16	10	15	18
Benefits slightly outweigh harmful results	29	27	19	18	19
Benefits equal harmful results	16	25	30	23	27
Harmful results slightly outweigh benefits	12	17	29	30	21
Harmful results strongly outweigh benefits	24	15	13	14	15
High school graduate					
Benefits strongly outweigh harmful results	21	19	20	18	18
Benefits slightly outweigh harmful results	24	27	21	24	24
Benefits equal harmful results	13	12	21	21	16
Harmful results slightly outweigh benefits	15	21	23	18	24
Harmful results strongly outweigh benefits	27	21	14	19	18
Baccalaureate and higher					
Benefits strongly outweigh harmful results	33	29	35	27	27
Benefits slightly outweigh harmful results	29	28	30	28	28
Benefits equal harmful results	7	15	16	21	16
Harmful results slightly outweigh benefits	13	15	14	14	17
Harmful results strongly outweigh benefits	18	13	6	10	12
Attentive public to science and technology[a]					
Benefits strongly outweigh harmful results	37	32	42	36	33
Benefits slightly outweigh harmful results	28	30	22	24	31
Benefits equal harmful results	9	9	16	13	8
Harmful results slightly outweigh benefits	12	12	13	16	19
Harmful results strongly outweigh benefits	14	17	7	11	9
Attentive public to medical research[a]					
Benefits strongly outweigh harmful results	29	31	34	27	28
Benefits slightly outweigh harmful results	24	27	21	25	24
Benefits equal harmful results	12	12	17	18	12
Harmful results slightly outweigh benefits	11	17	18	18	23
Harmful results strongly outweigh benefits	24	13	9	12	13

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 8-26.
Public assessment of genetic engineering, by selected characteristics: 1985-99 (selected years)

Characteristic	1985	1990	1995	1997	1999
	Sample size				
All adults	2,005	2,033	2,006	2,000	1,882
Male	950	964	953	930	900
Female	1,054	1,070	1,053	1,070	982
Less than high school graduate	507	495	418	420	403
High school graduate	1,143	1,179	1,196	1,188	1,111
Baccalaureate and higher	349	359	392	392	368
Attentive public to science and technology[a]	235	229	195	288	216
Attentive public to medical research[a]	349	337	310	377	301

NOTES: In 1985, the question was worded, "Some persons have argued that the creation of new life forms through genetic engineering constitutes a serious risk, while other persons have argued that this research may yield major benefits for society. In your opinion, are the risks of genetic engineering greater than the benefits, or are the benefits of genetic engineering research greater than the risks? Would you say that the benefits are substantially greater than the risks, or only slightly greater than the risks? Would you say that the risks are substantially greater than the benefits or only slightly greater than the benefits?" In 1990, the question was worded, "Some persons have argued that the creation of new life forms through genetic engineering research constitutes a serious risk, while other persons have argued that this research may yield major benefits for society. In your opinion, are the risks of genetic engineering research greater than its benefits, or are the benefits of genetic engineering research greater than its risks? Would you say that the benefits have substantially exceeded the risks or only slightly exceeded the risks? Would you say that the risks have substantially exceeded the benefits or only slightly exceeded the benefits?" In 1995, the question was worded, "Some persons have argued that the creation of new life forms through genetic engineering research constitutes a serious risk, while other persons have argued that this research may yield major benefits for society. In your opinion, have the benefits of genetic engineering research outweighed the harmful results, or have the harmful results of genetic engineering research been greater than its benefits? Would you say that the balance has been strongly in favor of beneficial results or only slightly? Would you say that the balance has been strongly in favor of harmful results or only slightly?" In 1997 and 1999, one-half of the respondents were asked the question used in 1995. The other one-half were asked: "Some persons have argued that the modification of existing life forms through genetic engineering research constitutes a serious risk, while other persons have argued that this research may yield major benefits for society. In your opinion, have the benefits of engineering research outweighed the harmful results, or have the harmful results of genetic engineering research been greater than its benefits? Would you say that the balance has been strongly in favor of beneficial results or only slightly? Would you say that the balance has been strongly in favor of harmful results or only slightly?" Percentages may not total 100 because of rounding.

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figures 8-12 and 8-13 in Volume 1.

Appendix table 8-27.
Public assessment of space exploration, by selected characteristics: 1985–99 (selected years)

Characteristic	1985	1988	1990	1992	1995	1997	1999
	Percent						
All adults							
Benefits strongly outweigh costs	27	22	18	17	22	24	24
Benefits slightly outweigh costs	27	25	25	26	24	24	25
Benefits equal costs	7	9	9	9	8	10	8
Costs slightly outweigh benefits	15	18	17	22	17	17	17
Costs strongly outweigh benefits	24	26	31	26	28	25	26
Male							
Benefits strongly outweigh costs	33	28	23	17	28	31	31
Benefits slightly outweigh costs	31	27	26	26	25	25	26
Benefits equal costs	6	10	8	9	6	8	5
Costs slightly outweigh benefits	12	13	16	22	16	15	15
Costs strongly outweigh benefits	18	22	27	26	24	21	23
Female							
Benefits strongly outweigh costs	21	16	14	11	17	18	19
Benefits slightly outweigh costs	24	23	24	25	23	23	24
Benefits equal costs	8	9	10	11	10	12	10
Costs slightly outweigh benefits	17	23	17	27	18	18	18
Costs strongly outweigh benefits	30	29	35	26	32	29	29
Less than high school graduate							
Benefits strongly outweigh costs	22	16	15	14	14	18	15
Benefits slightly outweigh costs	25	26	20	29	20	21	25
Benefits equal costs	10	9	17	12	13	16	15
Costs slightly outweigh benefits	17	21	16	24	21	24	18
Costs strongly outweigh benefits	26	29	32	21	31	21	27
High school graduate							
Benefits strongly outweigh costs	26	21	17	15	23	23	26
Benefits slightly outweigh costs	28	25	25	25	24	23	23
Benefits equal costs	6	9	7	9	6	9	5
Costs slightly outweigh benefits	14	18	17	23	17	16	17
Costs strongly outweigh benefits	26	27	34	28	30	29	29
Baccalaureate and higher							
Benefits strongly outweigh costs	36	33	27	22	32	31	31
Benefits slightly outweigh costs	28	26	28	26	27	29	29
Benefits equal costs	6	10	7	6	8	8	6
Costs slightly outweigh benefits	13	15	16	18	14	12	16
Costs strongly outweigh benefits	17	16	22	28	20	20	18
Attentive public to science and technology[a]							
Benefits strongly outweigh costs	39	38	26	28	32	44	34
Benefits slightly outweigh costs	27	28	33	26	25	22	28
Benefits equal costs	7	6	4	11	7	6	2
Costs slightly outweigh benefits	13	10	14	20	16	11	17
Costs strongly outweigh benefits	14	21	23	15	20	17	19
Attentive public to space exploration[a]							
Benefits strongly outweigh costs	49	46	36	38	52	57	41
Benefits slightly outweigh costs	25	30	36	44	23	19	26
Benefits equal costs	8	4	3	3	4	6	2
Costs slightly outweigh benefits	11	7	11	6	12	10	19
Costs strongly outweigh benefits	7	13	14	9	9	8	12

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 8-27.
Public assessment of space exploration, by selected characteristics: 1985–99 (selected years)

Characteristic	1985	1988	1990	1992	1995	1997	1999
	Sample size						
All adults	2,005	2,041	2,033	1,004	2,006	2,000	1,882
Male	950	958	964	486	953	930	900
Female	1,054	1,084	1,070	533	1,053	1,070	982
Less than high school graduate	507	530	495	215	418	420	403
High school graduate	1,147	1,158	1,202	623	1,196	1,188	1,111
Baccalaureate and higher	349	353	336	203	392	392	368
Attentive public to science and technology[a]	235	233	229	105	195	288	216
Attentive public to space exploration[a]	184	163	123	51	99	168	120

NOTES: Responses are to the following questions: "Many current issues in science and technology may be viewed as a judgment of relative benefits. Thinking first about the space program, some persons have argued that the costs of the space program may have exceeded its benefits, while other people have argued that the benefits of space exploration have exceeded its costs. In your opinion, have the costs of space exploration exceeded its benefits, or have the benefits of space exploration exceeded its costs? Would you say that the benefits have substantially exceeded the costs, or only slightly exceeded the costs? Would you say that the costs have substantially exceeded the benefits or only slightly exceeded the benefits?" Percentages may not total 100 because of rounding.

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figure 8-14 in Volume 1.

Appendix table 8-28.
Public assessment of the use of dogs and chimpanzees in scientific research, by selected characteristics: 1988–99 (selected years)

Characteristic	1988	1990	1992	1995	1997	1999
	Percent					
All adults						
Strongly agree	5	5	9	7	7	7
Agree	48	45	44	43	39	43
Do not know	5	6	5	4	3	3
Disagree	28	31	28	33	33	30
Strongly disagree	14	13	14	13	18	17
Male						
Strongly agree	7	7	13	10	11	9
Agree	55	55	52	52	47	53
Do not know	5	4	3	3	3	3
Disagree	26	26	25	26	28	27
Strongly disagree	7	8	7	9	11	8
Female						
Strongly agree	4	3	6	4	5	5
Agree	41	36	37	35	32	33
Do not know	6	7	6	5	3	4
Disagree	30	35	31	40	37	33
Strongly disagree	19	19	20	16	23	25
Less than high school graduate						
Strongly agree	3	4	8	7	4	11
Agree	53	49	47	44	28	44
Do not know	6	6	4	5	2	4
Disagree	26	30	28	34	43	29
Strongly disagree	12	11	13	10	23	12
High school graduate						
Strongly agree	5	5	8	5	8	5
Agree	44	41	42	41	39	42
Do not know	5	6	5	4	4	3
Disagree	31	32	30	35	31	31
Strongly disagree	15	16	15	15	18	19
Baccalaureate and higher						
Strongly agree	9	6	13	11	10	10
Agree	52	53	50	48	51	47
Do not know	7	7	5	4	4	3
Disagree	23	26	22	26	26	25
Strongly disagree	9	8	10	11	9	15
Attentive public to science and technology[a]						
Strongly agree	7	7	10	15	10	9
Agree	52	43	45	42	36	48
Do not know	6	7	3	3	6	2
Disagree	21	29	24	25	24	23
Strongly disagree	14	14	18	15	24	18

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 8-28.
Public assessment of the use of dogs and chimpanzees in scientific research, by selected characteristics: 1988–99 (selected years)

Characteristic	1988	1990	1992	1995	1997	1999
Adults 18 to 24 years old						
Strongly agree	4	3	15	4	6	4
Agree	43	35	37	35	20	34
Do not know	3	4	2	2	4	0
Disagree	29	32	26	37	41	27
Strongly disagree	21	26	20	22	29	35
Adults 25 to 34 years old						
Strongly agree	5	5	10	8	7	4
Agree	45	40	40	41	42	48
Do not know	5	4	3	4	2	1
Disagree	30	35	33	34	33	35
Strongly disagree	15	16	14	13	16	12
Adults 35 to 44 years old						
Strongly agree	5	6	9	8	7	5
Agree	47	44	41	41	41	45
Do not know	6	6	6	4	4	4
Disagree	28	31	30	34	33	30
Strongly disagree	14	13	14	13	15	16
Adults 45 to 54 years old						
Strongly agree	4	4	6	6	7	7
Agree	50	54	41	43	38	52
Do not know	5	4	5	4	5	3
Disagree	27	27	31	35	29	22
Strongly disagree	14	11	17	12	21	16
Adults 55 to 64 years old						
Strongly agree	5	3	9	10	10	8
Agree	52	51	47	48	45	44
Do not know	6	10	8	4	2	1
Disagree	27	29	24	31	29	33
Strongly disagree	10	7	12	7	14	14
Adults 65 and older						
Strongly agree	6	6	7	5	8	15
Agree	53	52	61	53	45	37
Do not know	6	9	5	7	4	10
Disagree	27	26	21	27	33	28
Strongly disagree	8	7	6	8	10	10
Sample size						
All adults	2,041	2,033	2,001	2,006	996	904
Male	958	964	950	953	454	455
Female	1,084	1,070	1,051	1,053	542	449
Less than high school graduate	530	495	403	418	216	188
High school graduate	1,158	1,202	1,202	1,196	579	534
Baccalaureate and higher	353	336	306	392	200	182
Adults 18 to 24 years old	318	322	276	275	146	134
Adults 25 to 34 years old	485	497	459	471	223	198
Adults 35 to 44 years old	372	366	430	423	199	188
Adults 45 to 54 years old	264	264	318	308	171	140
Adults 55 to 64 years old	267	269	191	205	90	98
Adults 65 and older	332	315	326	321	163	145

NOTE: Responses are to the following question: "Scientists should be allowed to do research that causes pain and injury to animals like dogs and chimpanzees if it produces new information about human health problems. Do you strongly agree, agree, disagree, or strongly disagree?"

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, *Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figure 8-15 in Volume 1.

Appendix table 8-29.
Public assessment of the use of mice in scientific research, by selected characteristics: 1999
(Percentages)

Characteristic	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	Sample size
All adults	10	60	2	21	7	1,882
Sex						
Male	14	65	2	15	4	900
Female	6	55	3	27	9	982
Formal education						
Less than high school	7	60	1	26	6	403
High school graduate	9	59	3	22	7	1,111
Baccalaureate degree and higher	17	60	2	16	5	368
Science/mathematics education[a]						
Low	8	60	3	23	6	1,051
Middle	9	59	1	22	9	480
High	15	61	2	17	5	351
Age						
18 to 24	6	47	2	29	16	263
25 to 34	8	61	3	22	6	440
35 to 44	11	60	3	20	6	395
45 to 54	14	60	1	20	5	295
55 to 64	11	65	2	18	4	191
65 and older	10	66	2	18	4	296
Attentiveness to science and technology[b]						
Attentive public	15	56	2	21	6	216
Interested public	13	60	2	20	5	836
Residual public	6	60	3	23	8	830
Question order						
Mice first	13	58	3	20	6	978
Dogs and chimps first	7	62	2	23	6	904

NOTE: Responses are to the following question: "Scientists should be allowed to do research that causes pain and injury to animals like mice if it produces new information about human health problems. Do you strongly agree, agree, disagree, or strongly disagree?"

[a]Respondents were classified as having a "high" level of science/mathematics education if they took nine or more high school and college science/math courses. They were classified as "middle" if they took six to eight such courses, and as "low" if they took five or fewer.

[b]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, *Public Attitudes Toward Science and Technology, 1979- 1999, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-22 in Volume 1.

Appendix table 8-30.
Public's access to computers from work and home, by selected characteristics: 1983–99 (selected years)

Characteristic	1983	1985	1988	1990	1995	1997	1999
				Percent			
All adults							
No access	70	66	62	58	46	43	35
Home but not work	5	9	10	10	15	19	23
Work but not home	22	19	19	20	18	15	11
Work and home	3	6	9	12	21	23	31
Male							
No access	68	62	59	55	41	42	35
Home but not work	3	9	10	11	15	18	19
Work but not home	25	21	20	19	19	14	10
Work and home	4	8	11	15	25	26	36
Female							
No access	72	69	66	61	50	44	35
Home but not work	6	8	9	10	15	21	26
Work but not home	20	18	19	21	18	15	12
Work and home	2	5	6	8	17	20	27
Less than high school graduate							
No access	94	87	92	85	80	79	74
Home but not work	<1	6	5	6	8	16	17
Work but not home	5	7	3	8	10	2	5
Work and home	<1	0	0	1	2	3	5
High school graduate							
No access	66	65	58	55	42	40	30
Home but not work	6	9	12	12	18	21	26
Work but not home	25	21	23	22	20	18	13
Work and home	3	5	7	11	20	21	31
Baccalaureate and higher							
No access	47	40	33	29	18	12	8
Home but not work	6	10	10	12	15	20	19
Work but not home	39	33	31	29	22	18	12
Work and home	8	17	26	30	45	50	61
Attentive public for science and technology[a]							
No access	61	56	50	44	31	34	31
Home but not work	7	10	14	15	19	24	23
Work but not home	22	23	20	16	13	12	7
Work and home	10	11	16	25	37	30	39
				Sample size			
All adults	631	2,005	2,041	2,033	2,006	2,000	1,882
Male	775	950	958	964	953	930	900
Female	856	1,054	1,084	1,070	1,053	1,070	982
Less than high school graduate	404	507	530	495	418	420	403
High school graduate	941	1,147	1,158	1,202	1,196	1,188	1,111
Baccalaureate and higher	282	349	353	336	392	392	368
Attentive public to science & technology[a]	208	235	233	229	195	288	216

NOTE: In 1985, 1988, 1990, 1995, 1997, and 1999, the question was worded, "Do you use a computer in your work? About how many hours do you personally use your work computer in a typical week? Do you presently have a home computer in your household? About how many hours do you personally use your home computer in a typical week? In 1983, the question was worded, "Do you use computers or word processing equipment in your work?."

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, *Public Attitudes Toward Science and Technology, 1979- 1999, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figures 8-16 and 8-19 in Volume 1.

Appendix table 8-31.
Public's access to computers from work and home, by selected characteristics: 1995, 1997, and 1999

Characteristic	1995	1997	1999
	Percent		
All adults			
Have more than one computer in home	-	12	17
Have CD-ROM reader in home computer	14	29	45
Have modem in home computer	21	33	46
Subscribe to network service at home	7	18	32
Have e-mail address at home	-	18	31
Have ever accessed the WWW at home	-	16	28
Have e-mail address at work	-	16	20
Have access to the WWW at work	-	14	23
Male			
Have more than one computer in home	-	14	19
Have CD-ROM reader in home computer	16	31	48
Have modem in home computer	24	35	48
Subscribe to network service at home	9	21	34
Have e-mail address at home	-	20	33
Have ever accessed the WWW at home	-	20	30
Have e-mail address at work	-	18	24
Have access to the WWW at work	-	18	27
Female			
Have more than one computer in home	-	11	15
Have CD-ROM reader in home computer	13	26	42
Have modem in home computer	18	30	44
Subscribe to network service at home	5	15	31
Have e-mail address at home	-	15	30
Have ever accessed the WWW at home	-	13	26
Have e-mail address at work	-	14	16
Have access to the WWW at work	-	11	19
Less than high school graduate			
Have more than one computer in home	-	5	4
Have CD-ROM reader in home computer	3	8	14
Have modem in home computer	2	13	15
Subscribe to network service at home	1	1	9
Have e-mail address at home	-	6	7
Have ever accessed the WWW at home	-	5	6
Have e-mail address at work	-	1	1
Have access to the WWW at work	-	2	3
High school graduate			
Have more than one computer in home	-	11	17
Have CD-ROM reader in home computer	15	29	47
Have modem in home computer	22	31	48
Subscribe to network service at home	6	17	33
Have e-mail address at home	-	17	32
Have ever accessed the WWW at home	-	14	28
Have e-mail address at work	-	12	16
Have access to the WWW at work	-	11	19
Baccalaureate and higher			
Have more than one computer in home	-	24	31
Have CD-ROM reader in home computer	25	51	72
Have modem in home computer	36	57	74
Subscribe to network service at home	16	37	57
Have e-mail address at home	-	33	55
Have ever accessed the WWW at home	-	34	52
Have e-mail address at work	-	41	52
Have access to the WWW at work	-	39	57

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 8-31.
Public's access to computers from work and home, by selected characteristics: 1995, 1997, and 1999

Characteristic	1995	1997	1999
	Percent		
Attentive public to science and technology[a]			
Have more than one computer in home	-	17	22
Have CD-ROM reader in home computer	24	40	56
Have modem in home computer	37	47	55
Subscribe to network service at home	16	26	36
Have e-mail address at home	-	30	36
Have ever accessed the WWW at home	-	30	33
Have e-mail address at work	-	23	24
Have ever accessed the WWW at work	-	23	28
	Sample Size		
All adults	2,006	2,000	1,882
Male	953	930	900
Female	1,053	1,070	982
Less than high school graduate	418	420	403
High school graduate	1,196	1,188	1,111
Baccalaureate and higher	392	392	368
Attentive public to science & technology[a]	195	288	216

- = not included in survey; WWW = World Wide Web

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, *Public Attitudes Toward Science and Technology, 1979- 1999, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figures 8-17 and 8-18 in Volume 1.

Appendix table 8-32.
Public's access to and use of computers at home and work, by selected characteristics: 1999

Characteristic	Percent												Hours per year			Sample size
						On home computer					On work computer					
	Computer in work	Computer at home	Computer home & work	Computer home or work	No computer	Modem	On-line service	CD-ROM	E-mail address	Access WWW	E-mail address	Access WWW	Work computer	Home computer	On-line	
All adults	42	54	31	65	35	46	32	45	31	28	20	23	421	153	86	1,882
Formal education																
Less than high school	9	21	5	26	74	15	9	14	7	6	1	3	105	43	21	403
High school graduate	44	57	31	70	30	48	33	47	32	28	16	19	411	157	76	1,111
Baccalaureate	70	78	57	91	9	71	55	68	54	50	47	51	788	266	184	239
Graduate/professional	78	84	68	93	7	78	61	77	56	57	62	67	821	257	195	129
Science/mathematics education[a]																
Low	28	39	18	49	51	29	19	29	18	15	9	12	262	87	42	1,051
Middle	53	67	41	79	21	60	46	59	43	41	23	26	510	201	110	480
High	70	81	57	94	6	76	56	73	55	51	47	53	777	287	186	351
Sex																
Male	46	55	36	65	35	48	34	48	33	30	24	27	419	171	101	900
Female	39	53	27	65	35	44	31	42	30	26	16	19	424	137	72	982
Attentiveness to science or technology[b]																
Attentive public	46	62	39	69	31	55	36	56	36	33	24	28	527	259	113	216
Interested public	46	59	34	71	29	50	37	50	34	32	22	28	435	167	107	836
Residual public	37	47	26	58	42	39	27	37	27	22	16	18	381	112	58	830
Cable																
Cable and satellite	66	86	61	93	7	77	55	83	62	55	24	24	622	293	130	29
Have cable	44	55	32	67	33	46	34	45	32	29	19	23	439	162	93	1,216
Satellite dish	41	59	30	70	30	51	32	48	32	28	21	24	410	156	84	216
Neither[c]	37	46	27	56	44	40	25	39	25	21	20	23	361	118	65	421

WWW = World Wide Web

NOTE: Responses are to the statements: "Do you use a computer in your work? About how many hours do you personally use your work computer in a typical week? Do you have an e-mail address for use at work? Do you have access to the World Wide Web through your work computer? Do you presently have a home computer in your household? About how many hours do you personally use your home computer in a typical week? Do you have a CD-ROM reader in your home computer? Do you have a modem in your home computer? Do you presently subscribe to any network service such as CompuServe, Prodigy, America Online, or any other dial-in service? About how many hours a month do you use your dial-in or network service? Do you have an e-mail address that you use with your home computer? Do you ever access the World Wide Web through your home computer?"

[a]Respondents were classified as having a "high" level of science/mathematics education if they took nine or more high school and college science/math courses. They were classified as "middle" if they took six to eight such courses, and as "low" if they took five or fewer.

[b]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

[c]This category includes respondents who reported that they did not watch any television.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figure 8-18 and text table 8-5 in Volume 1.

Appendix table 8-33.
Public use of information on an annual basis, by selected characteristics: 1999

Characteristic	Hours per year					Copies per year			Visits per year		Number per year		Sample size
	Total TV	TV news	Science TV	Total radio	Radio news	News-papers	News magazines	Science magazines	Science museum	Public library	Books borrowed	Video tapes borrowed	
All adults	1,017	431	42	918	228	178	11.3	3.2	2.2	8.6	11.3	1.2	1,882
Formal education													
Less than high school	1,404	550	36	870	223	157	5.5	1.6	1.8	4.8	4.6	0.5	403
High school graduate	976	419	43	1,009	224	174	10.6	3.1	2.0	9.1	11.8	1.2	1,111
Baccalaureate	733	335	48	761	261	202	18.1	4.8	3.4	11.1	15.3	1.7	239
Graduate/professional	680	347	40	570	221	229	21.9	6.5	3.1	12.5	19.6	2.0	129
Science/mathematics education[a]													
Low	1,175	482	42	971	227	172	7.5	2.2	1.6	6.1	7.3	0.7	1,051
Middle	923	405	42	920	229	185	15.1	3.5	2.5	10.3	14.6	1.4	480
High	670	316	44	752	229	184	17.2	5.8	3.6	13.9	18.5	2.2	351
Sex													
Male	1,009	410	46	965	254	189	11.8	4.5	2.2	7.3	7.4	1.0	900
Female	1,023	450	38	874	204	168	10.8	2.0	2.2	9.8	14.8	1.3	982
Attentiveness to science or technology[b]													
Attentive public	1,036	509	52	864	301	287	24.8	9.1	3.8	11.4	14.5	1.3	216
Interested public	1,078	442	50	910	223	161	9.7	3.5	2.4	8.2	10.4	1.2	836
Residual public	950	401	31	939	214	167	9.4	1.4	1.6	8.4	11.3	1.0	830
Cable													
Cable and satellite	879	503	24	935	291	200	10.7	4.3	3.7	9.7	14.3	0.6	29
Have cable	1,100	458	50	890	204	184	12.2	3.2	2.3	7.8	9.4	0.9	1,216
Satellite dish	1,099	426	39	1,002	279	181	7.0	3.4	2.2	9.0	13.2	1.4	216
Neither[c]	743	352	20	952	268	155	10.7	2.9	1.8	10.6	15.3	1.2	421

[a]Respondents were classified as having a "high" level of science/mathematics education if they took nine or more high school and college science/math courses. They were classified as "middle" if they took six to eight such courses, and as "low" if they took five or fewer.

[b]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues, but who is a member of the interested public for at least one of those issues, is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

[c]This category includes respondents who reported that they did not watch any television.

NOTE: Responses are to the statements: "Altogether, on an average day, about how many hours would you say that you watch television? About how many of those hours are news reports or news shows?" "Now, let me ask you about your use of museums, zoos, and similar institutions. I am going to read to you a short list of places and ask you to tell me how many times you visited each type of place during the last year, that is, the last 12 months. If you did not visit a given place, just say none. A natural history museum- how many times did you visit it during the last year? A zoo or an aquarium- how many times did you visit it during the last year? A science or technology museum- how many times did you visit it during the last year? A public library- how many times did you visit it during the last year?"; "During the last 12 months, did you borrow any books from the public library? *(If yes):* About how many books did you borrow during the last year?" "During the last 12 months, did you borrow any videotapes from the library? *(If yes):* About how many videotapes did you borrow during the last year?" "Do you watch any television shows that focus primarily on science or nature? Which science or nature show do you watch most often? About how many times a month do you watch this show?"; and "On an average day, about how many hours would you say that you listen to a radio? About how many of those hours are news reports or news shows?" "Now let me change the topic slightly and ask you how you get information. First, how often do you read a newspaper: every day, a few times a week, once a week, or less than once a week?" "Are there any magazines that you read regularly, that is most of the time? *If yes:* What magazine would that be? Is there another magazine that you read regularly?

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, *Public Attitudes Toward Science and Technology, 1979- 1999, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-26 in Volume 1.

Appendix table 8-34.
Public use of various sources of information, by selected characteristics: 1999
(Percentages)

Characteristic	Newspaper every day	News mag. read regularly	TV news 1+hr/day	Radio news 1+hr/day	Public library 1 visit/yr	Public library 5 visits/yr	Science magazine 1+/month	Science TV 1+/month	Science museum 1+/year	Purchased one+ book/yr Any	Purchased one+ book/yr Science	Sample size
All adults	41	17	67	29	72	40	22	59	61	62	33	1,882
Formal education												
Less than high school	36	9	78	26	53	25	13	48	37	34	10	403
High school graduate	40	16	66	29	76	43	22	62	63	65	35	1,111
Baccalaureate	48	26	59	33	82	52	27	61	83	86	53	239
Graduate/professional	57	34	56	29	81	49	38	64	79	86	56	129
Science/mathematics education[a]												
Low	40	13	73	29	63	31	17	54	49	50	21	1,051
Middle	42	22	64	27	81	46	24	63	73	71	39	480
High	42	26	54	30	87	61	35	68	82	88	61	351
Sex												
Male	44	18	65	32	69	36	31	65	63	57	34	900
Female	38	16	69	26	75	44	14	54	60	67	33	982
Attentiveness to science & technology[b]												
Attentive public	75	38	74	35	79	55	51	74	73	79	58	216
Interested public	35	15	69	29	77	40	25	64	67	67	37	836
Residual public	38	14	64	26	66	37	12	50	52	53	23	830
Cable												
Have cable and satellite	46	17	72	45	72	52	28	72	72	79	57	29
Have cable	43	19	70	26	74	39	22	66	62	63	33	1,216
Satellite dish	40	10	66	31	69	40	26	69	62	62	34	216
Neither[c]	35	16	58	34	70	44	20	35	58	60	32	421

[a]Respondents were classified as having a "high" level of science/mathematics education if they took nine or more high school and college science/math courses. They were classified as "middle" if they took six to eight such courses, and as "low" if they took five or fewer.

[b]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

[c]This category includes respondents who reported that they did not watch any television.

NOTE: Responses are to the statements: "How often do you read a newspaper: every day, a few times a week, once a week, or less than once a week?"; "Are there any magazines that you read regularly, that is, most of the time? What magazine would that be?";"Altogether, on an average day, about how many hours would you say that you watch television? About how many of those hours are news reports or news shows?"; "Now let me ask you about your use of museums, zoos, and similar institutions. I am going to read you a short list of places and ask you to tell me how many times you visited each type of place during the last year, that is, the last 12 months. If you did not visit any given place, just say none. A natural history museum- how many times did you visit it during the last year? A zoo or an aquarium- how many times did you visit it during the last year? A science or technology museum- how many times did you visit it during the last year? A public library- how many times did you visit it during the last year?"; "Do you watch any television shows that focus primarily on science or nature? Which science or nature show do you watch most often? About how many times a month do you watch this show?"; and "On an average day, about how many hours would you say that you listen to a radio? About how many of those hours are news reports or news shows?"

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, *Public Attitudes Toward Science and Technology, 1979- 1999, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-26 in Volume 1.

Appendix table 8-35.
Percentage of the public reading a newspaper every day, by selected characteristics: 1979–99 (selected years)

Characteristic	1979	1981	1985	1988	1990	1992	1995	1997	1999
					Percent				
All adults	60	62	61	53	57	56	47	46	41
Sex									
Male	63	64	66	52	63	63	52	49	44
Female	57	61	57	55	52	50	43	43	38
Formal education									
Less than high school	52	56	55	46	53	47	42	41	36
High school graduate	59	62	61	54	55	56	46	44	40
Baccalaureate degree	74	68	68	59	71	59	55	53	48
Graduate/professional degree	84	75	79	68	70	70	60	59	57
Attentiveness to science or technology[a]									
Attentive public	88	88	85	77	87	76	77	79	75
Interested public	56	59	55	51	54	53	41	38	35
Residual public	58	57	61	50	53	54	48	42	38
					Sample size				
All adults	1,635	1,631	2,005	2,041	2,033	1,004	2,006	2,000	1,882
Male	773	775	950	958	964	486	953	930	900
Female	862	856	1,054	1,084	1,070	533	1,053	1,070	982
Less than high school graduate	465	404	507	530	495	215	418	420	403
High school graduate	932	941	1,147	1,158	1,202	623	1,196	1,188	1,111
Baccalaureate and higher	238	282	349	353	336	203	392	392	368
Attentive public to science and technology[a]	154	208	235	233	229	105	195	288	216

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it; and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figure 8-20 in Volume 1.

Appendix table 8-36.
Percentage of the public visiting a science or technology museum one or more times per year: 1983–99 (selected years)

Characteristic	1983	1985	1988	1990	1992	1995	1997	1999
				Percent				
All adults	61	58	59	59	62	61	60	61
Sex								
Male	62	58	57	59	60	59	63	63
Female	60	57	61	60	63	63	58	60
Formal education								
Less than high school	43	37	36	30	40	32	34	37
High school graduate	63	61	64	66	64	64	64	63
Baccalaureate degree	78	78	80	79	78	80	78	83
Graduate/professional degree	83	79	81	76	78	83	75	79
Attentiveness to science or technology[a]								
Attentive public	72	70	61	69	67	71	68	73
Interested public	66	60	63	60	61	65	66	67
Residual public	51	53	56	57	61	54	51	52
				Sample size				
All adults	1,631	2,005	2,041	2,033	1,004	2,006	2,000	1,882
Male	775	950	958	964	486	953	930	900
Female	856	1,054	1,084	1,070	533	1,053	1,070	982
Less than high school graduate	404	507	530	495	215	418	420	403
High school graduate	941	1,147	1,158	1,202	623	1,196	1,188	1,111
Baccalaureate and higher	282	349	353	336	203	392	392	368
Attentive public to science and technology[a]	208	235	233	229	105	195	288	216

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues, but who is a member of the interested public for at least one of those issues, is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979- 1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-26 in Volume 1.

Appendix table 8-37.
Public assessment of the quality of science and mathematics education in the U.S., by selected characteristics: 1985–99 (selected years)

Characteristic	1985	1988	1990	1992	1995	1997	1999
	Percent						
All adults							
Strongly agree	14	18	24	24	21	23	21
Agree	49	50	48	51	48	45	42
Do not know	8	7	4	4	6	6	7
Disagree	27	23	22	19	22	22	26
Strongly disagree	2	2	2	2	3	4	4
Male							
Strongly agree	14	17	24	24	20	22	19
Agree	49	50	50	51	49	44	46
Do not know	7	7	3	3	5	6	6
Disagree	28	23	21	19	23	25	25
Strongly disagree	2	2	2	3	3	3	4
Female							
Strongly agree	14	18	24	24	21	24	23
Agree	49	49	46	50	48	45	38
Do not know	9	7	5	5	7	7	7
Disagree	26	24	22	19	21	20	28
Strongly disagree	2	2	3	2	3	4	4
Less than high school graduate							
Strongly agree	7	11	19	17	14	14	14
Agree	53	51	45	51	47	45	36
Do not know	11	14	9	5	13	10	12
Disagree	27	22	23	24	22	27	32
Strongly disagree	2	2	4	3	4	4	6
High school graduate							
Strongly agree	15	19	24	24	20	24	22
Agree	48	49	49	50	49	45	44
Do not know	7	5	3	4	5	6	5
Disagree	28	25	22	19	23	21	26
Strongly disagree	2	2	2	3	3	4	3
Baccalaureate and higher							
Strongly agree	22	24	30	29	28	29	27
Agree	45	50	48	53	48	44	44
Do not know	5	4	3	2	3	4	5
Disagree	25	20	16	15	19	20	21
Strongly disagree	3	2	3	1	2	3	3
Attentive public for science and technology[a]							
Strongly agree	20	26	36	31	32	33	32
Agree	53	48	46	49	42	37	36
Do not know	5	5	1	3	2	4	5
Disagree	20	20	15	14	21	21	19
Strongly disagree	2	1	2	4	3	5	7

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 8-37.
Public assessment of the quality of science and mathematics education in the U.S., by selected characteristics: 1985–99 (selected years)

Characteristic	1985	1988	1990	1992	1995	1997	1999
				Sample size			
All adults	2,005	2,041	2,033	1,004	2,006	2,000	1,882
Male	950	958	964	486	953	930	900
Female	1,054	1,084	1,070	533	1,053	1,070	982
Less than high school graduate	507	530	495	215	418	420	403
High school graduate	1,147	1,158	1,202	623	1,196	1,188	1,111
Baccalaureate and higher	349	353	336	203	392	392	368
Attentive public to science and technology[a]	235	233	229	105	195	288	216

NOTE: Responses are to the following question: "The quality of science and mathematics education in American schools is inadequate. Do you strongly agree, agree, disagree, or strongly disagree?"

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, *Public Attitudes Toward Science and Technology, 1979- 1999, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-32 in Volume 1.

Appendix table 8-38.
Public assessment of astrology, by selected characteristics: 1979–99 (selected years)

Characteristic	1979	1981	1985	1988	1990	1992	1995	1997	1999
					Percent				
All adults									
Very scientific	7	10	8	6	6	6	7	7	7
Sort of scientific	34	35	31	31	29	29	28	29	29
Not at all scientific	50	51	57	60	60	62	60	59	59
Do not know	9	4	4	3	5	3	5	5	5
Male									
Very scientific	7	9	7	5	5	6	7	7	7
Sort of scientific	30	29	29	25	23	25	24	27	25
Not at all scientific	54	58	60	67	67	67	65	63	63
Do not know	9	4	4	3	5	2	4	3	5
Female									
Very scientific	8	10	9	7	6	7	7	7	7
Sort of scientific	37	41	32	37	35	32	32	31	32
Not at all scientific	46	44	55	53	55	58	55	55	56
Do not know	9	5	4	3	4	3	6	7	5
Less than high school graduate									
Very scientific	11	13	14	11	7	12	11	11	13
Sort of scientific	34	37	38	35	31	33	28	37	34
Not at all scientific	39	40	43	50	50	49	48	42	41
Do not know	16	10	5	4	12	6	13	10	12
High school graduate									
Very scientific	7	10	8	6	6	6	8	7	7
Sort of scientific	37	38	29	32	32	31	30	30	30
Not at all scientific	50	50	60	59	60	61	59	59	60
Do not know	6	2	3	3	2	2	3	4	3
Baccalaureate and higher									
Very scientific	2	3	3	2	3	3	2	3	2
Sort of scientific	20	25	25	23	18	17	22	19	19
Not at all scientific	71	69	70	74	77	78	74	76	76
Do not know	7	3	2	1	2	2	2	2	3
Attentive public to science and technology[a]									
Very scientific	8	9	7	3	6	15	8	7	12
Sort of scientific	28	34	27	29	21	23	24	29	23
Not at all scientific	60	54	62	66	72	58	65	62	64
Do not know	4	3	4	2	1	4	3	2	1

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 8-38.
Public assessment of astrology, by selected characteristics: 1979–99 (selected years)

Characteristic	1979	1981	1985	1988	1990	1992	1995	1997	1999
					Sample size				
All adults	1,635	1,631	2,005	2,041	2,033	1,004	2,006	2,000	1,882
Male	773	775	950	958	964	486	953	930	900
Female	862	856	1,054	1,084	1,070	533	1,053	1,070	982
Less than high school graduate	465	404	507	530	495	215	418	420	403
High school graduate	932	941	1,147	1,158	1,202	623	1,196	1,188	1,111
Baccalaureate and higher	238	282	349	353	336	203	392	392	368
Attentive public to science and technology[a]	154	208	235	233	229	105	195	288	216

NOTE: Responses are to the following question: "Would you say that astrology is very scientific, sort of scientific, or not at all scientific?"

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it; and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979- 1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See figure 8-24 in Volume 1.

Appendix table 8-39.
Frequency of reading astrology reports, by selected characteristics: 1985–99 (selected years)

Characteristic	1985	1988	1990	1992	1997	1999
	Percent					
All adults						
Every day	9	9	9	8	7	6
Quite often	6	8	8	7	8	6
Just occasionally	37	33	33	35	33	32
Almost never	13	13	12	13	12	17
Never	35	37	38	37	38	39
Do not know	<1	0	0	0	2	<1
Male						
Every day	8	6	5	6	3	4
Quite often	5	4	4	6	6	4
Just occasionally	30	30	29	29	32	26
Almost never	14	15	14	14	13	18
Never	43	45	48	45	44	48
Do not know	<1	0	0	0	2	0
Female						
Every day	10	13	12	10	10	7
Quite often	6	11	11	9	9	7
Just occasionally	44	37	37	40	35	37
Almost never	12	10	11	12	11	16
Never	27	29	29	29	33	33
Do not know	<1	0	0	0	2	<1
Less than high school graduate						
Every day	11	13	13	10	11	11
Quite often	7	8	7	9	8	7
Just occasionally	31	28	28	35	32	26
Almost never	11	10	9	14	6	15
Never	39	41	43	32	43	41
Do not know	<1	0	0	0	<1	<1
High school graduate						
Every day	10	8	9	9	7	5
Quite often	5	9	8	8	9	6
Just occasionally	40	36	36	37	35	34
Almost never	13	13	12	11	13	17
Never	32	35	35	35	34	38
Do not know	<1	0	0	0	2	0
Baccalaureate and higher						
Every day	5	6	4	5	4	3
Quite often	5	5	6	4	4	4
Just occasionally	37	33	30	29	29	30
Almost never	16	16	18	16	15	20
Never	36	40	42	46	44	43
Do not know	<1	0	0	0	4	0
Attentive public to science and technology[a]						
Every day	12	17	13	15	13	7
Quite often	6	8	5	4	9	3
Just occasionally	33	30	38	27	30	33
Almost Never	13	11	10	11	12	16
Never	36	34	34	43	32	41
Do not know	0	0	0	0	4	0

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 8-39.
Frequency of reading astrology reports, by selected characteristics: 1985–99 (selected years)

Characteristic	1985	1988	1990	1992	1997	1999
	Sample size					
All adults	2,005	2,041	2,033	1,004	2,000	1,882
Male	950	958	964	486	930	900
Female	1,054	1,084	1,070	533	1,070	982
Less than high school graduate	507	530	495	215	420	403
High school graduate	1,147	1,158	1,202	623	1,188	1,111
Baccalaureate and higher	349	353	336	203	392	368
Attentive public to science and technology[a]	235	233	229	105	288	216

NOTE: Responses are to the following question: "Do you ever read a horoscope or your personal astrology report? *(If yes:)* Do you read an astrology report every day, quite often, just occasionally, or almost never?"

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, Public Attitudes Toward Science and Technology, 1979-1999, Integrated Codebook (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-32 in Volume 1.

Appendix table 8-40.
Public assessment of lucky numbers, by selected characteristics: 1988–99 (selected years)

Characteristic	1988	1990	1992	1995	1997	1999
	Percent					
All adults						
Strongly agree	1	2	3	2	2	3
Agree	35	33	33	35	34	31
Do not know	5	4	3	4	5	3
Disagree	51	51	50	48	46	51
Strongly disagree	8	10	11	11	13	12
Male						
Strongly agree	2	2	4	3	2	4
Agree	35	31	33	34	33	30
Do not know	4	3	3	3	5	2
Disagree	50	52	48	48	46	51
Strongly disagree	9	12	12	12	14	13
Female						
Strongly agree	1	2	2	2	2	3
Agree	36	36	34	37	36	32
Do not know	5	5	3	4	5	4
Disagree	52	50	52	48	45	51
Strongly disagree	6	7	9	9	12	10
Less than high school graduate						
Strongly agree	1	2	7	3	4	7
Agree	47	46	43	46	43	39
Do not know	7	6	5	6	8	4
Disagree	43	44	40	41	33	44
Strongly disagree	2	2	5	4	12	6
High school graduate						
Strongly agree	2	3	3	3	2	2
Agree	34	33	35	37	36	33
Do not know	3	3	2	3	4	3
Disagree	54	52	51	48	48	52
Strongly disagree	7	9	9	9	10	10
Baccalaureate and higher						
Strongly agree	1	1	0	1	2	1
Agree	23	16	18	20	20	21
Do not know	5	4	4	4	5	3
Disagree	53	59	57	55	52	52
Strongly disagree	18	20	21	20	21	23
Attentive public to science and technology[a]						
Strongly agree	2	2	5	6	5	6
Agree	36	28	32	25	29	27
Do not know	4	5	4	3	6	2
Disagree	45	51	44	48	42	45
Strongly disagree	13	14	15	18	18	20

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 8-40.
Public assessment of lucky numbers, by selected characteristics: 1988–99 (selected years)

Characteristic	1988	1990	1992	1995	1997	1999
			Sample size			
All adults	2,041	2,033	1,004	2,006	2,000	1,882
Male	958	964	486	953	930	900
Female	1,084	1,070	533	1,053	1,070	982
Less than high school graduate	530	495	215	418	420	403
High school graduate	1,158	1,202	623	1,196	1,188	1,111
Baccalaureate and higher	353	336	203	392	392	368
Attentive public to science and technology[a]	233	229	105	195	288	216

NOTE: Responses are to the following question: "Some numbers are especially lucky for some people. Do you strongly agree, agree, disagree, or strongly disagree?"

[a]To be classified as attentive to a given policy area, an individual must indicate that he or she is "very interested" in that issue area, report that he or she is "very well informed" about it, and be a regular reader of a daily newspaper or relevant national magazine. Citizens who report that they are "very interested" in an issue area, but who do not think that they are "very well informed" about it, are classified as the "interested public." All other individuals are classified as members of the "residual public" for that issue area. The attentive public for science and technology combines the attentive public for new scientific discoveries and the attentive public for new inventions and technologies. Any individual who is not attentive to either of those issues but who is a member of the interested public for at least one of those issues is classified as a member of the interested public for science and technology. All other individuals are classified as members of the residual public for science and technology.

SOURCES: National Science Foundation, Division of Science Resource Studies (NSF/SRS), *NSF Survey of Public Attitudes Toward and Understanding of Science and Technology, 1999* (and earlier years). For a complete set of data from the survey, see J.D. Miller and L. Kimmel, *Public Attitudes Toward Science and Technology, 1979- 1999, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1999); and unpublished tabulations.

See page 8-32 in Volume 1.

Appendix table 9-1.
Moore's Law: The trend in the number of transistors per chip over time

Microprocessor	Year	Transistors (000s)	Clock Speed (Mhz)
4004	1971	2.3	0.1
8008	1972	3.5	0.2
8080	1974	6.0	2.0
8086	1978	29.0	10.0
80286	1982	134.0	12.5
Intel386™	1985	275.0	16.0
Intel486™	1989	1,200.0	25.0
Pentium®	1993	3,100.0	60.0
Pentium® Pro	1995	5,500.0	200.0
Pentium® II	1997	7,500.0	300.0
Pentium® III	1999	9,500.0	600.0

SOURCE: Intel <<http://www.intel.com/pressroom/kits/processors/quickref.htm>>.

See figure 9-2 in Volume 1. *Science & Engineering Indicators - 2000*

Appendix table 9-2.
Number of Internet hosts

Date	Hosts	Source
08/81	213	host table
05/82	235	
08/83	562	
10/84	1,024	
10/85	1,961	
02/86	2,308	
11/86	5,089	
12/87	28,174	old domain survey
07/88	33,000	
10/88	56,000	
01/89	80,000	
07/89	130,000	
10/89	159,000	
10/90	313,000	
01/91	376,000	
07/91	535,000	
10/91	617,000	
01/92	727,000	
04/92	890,000	
07/92	992,000	
10/92	1,136,000	
01/93	1,313,000	
04/93	1,486,000	
07/93	1,776,000	
10/93	2,056,000	
01/94	2,217,000	
07/94	3,212,000	
10/94	3,864,000	adjusted counts
01/95	4,852,000	5,846,000
07/95	6,642,000	8,200,000
01/96	9,472,000	14,352,000
07/96	12,881,000	16,729,000
01/97	16,146,000	21,819,000
07/97	19,540,000	26,053,000
01/98	29,670,000	new domain survey
07/98	36,739,000	
01/99	43,230,000	
07/99	56,218,000	

SOURCE: Internet Software Consortium,<<http://www.isc.org/>>.

See figure 9-4 in Volume 1. *Science & Engineering Indicators - 2000*

Appendix table 9-3.
Department of Commerce Classification of IT producing and using industries

IT producing industries are producers of computer hardware and software, communications equipment and services, and instruments.

IT using industries are those that are among the top 15 industries in relation to either of two measures: IT capital stock as a share of total equipment stock (net of depreciation), or IT investment per employee.

Information Technology Producing Industries

Hardware Industries	**Software/Services Industries**
Computers and equipment	Computer Programming Services
Wholesale trade of computers and equipment	Prepackaged software
Retail trade of computers and equipment	Wholesale trade of software
Calculating and office machines, n.e.c.	Retail trade of software
Magnetic and optical recording media	Computer integrated systems design
Electron tubes	Computer processing, data preparation
Printed circuit boards	Information retrieval services
Semiconductors	Computer services management
Passive electronic components	Computer rental and leasing
Industrial instruments for measurement	Computer maintenance and repair
Instruments for measuring electricity	Computer related services, n.e.c.
Laboratory analytical instruments	
Communications Equipment Industries	**Communications Services Industries**
Household audio and video equipment	Telephone and telegraph communications
Telephone and telegraph equipment	Radio and TV broadcasting
Radio and TV and communications equipment	Cable and other pay TV services

Industries Considered Major Users of IT Equipment

Telecommunications	Security and commodity brokers
Radio and TV broadcasting	Business services
Other services, n.e.c	Health services
Motion pictures	Holding and investment offices
Legal services	Wholesale trade
Insurance carriers	Real estate
Instruments and related products	Insurance agents and brokers
Depository institutions	Nondepository institutions
Pipelines, except natural gas	Petroleum and coal products
Chemicals and allied products	Electronic equipment

SOURCE: U.S. Department of Commerce. 1999. *The Emerging Digital Economy II.* Washington, DC: U.S. Department of Commerce. Available online at <<http://www.ecommerce.gov>>.

See text tables 9-3 and 9-4 in Volume 1.

Appendix table 9-4.
Gross product by industry as a share of gross domestic product: 1959–94 (selected years)
(Percentages)

Industry	1959	1967	1977	1982	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Goods, total	38.9	36.0	32.8	31.0	27.3	27.6	26.8	26.2	24.7	24.0	23.7	24.3	24.4	24.4	24.2
Agriculture, forestry, and fishing	4.0	3.0	2.7	2.4	1.9	1.8	1.9	1.9	1.7	1.8	1.6	1.7	1.5	1.7	1.6
Mining	2.5	1.8	2.7	4.6	1.9	2.0	1.8	2.0	1.7	1.5	1.4	1.4	1.4	1.5	1.5
Construction	4.7	4.7	4.6	4.0	4.6	4.6	4.5	4.3	3.9	3.7	3.7	3.9	3.9	4.1	4.1
Manufacturing	27.7	26.5	22.8	20.0	18.9	19.2	18.6	18.0	17.4	17.0	17.0	17.3	17.6	17.1	17.0
Services, total	48.8	49.8	51.9	53.9	59.1	59.7	59.6	59.8	61.0	61.3	61.6	62.0	62.7	63.2	63.8
Transportation and public utilities[a]	8.9	8.5	8.9	9.0	9.0	8.8	8.5	8.4	8.7	8.5	8.6	8.6	8.5	8.5	8.3
Wholesale trade	7.1	6.9	7.0	6.8	6.4	6.7	6.6	6.4	6.6	6.5	6.5	6.7	6.8	6.8	6.9
Retail trade	9.7	9.4	9.4	8.9	9.3	9.1	9.0	8.8	8.7	8.7	8.7	8.9	8.8	8.8	8.8
Finance, insurance, and real estate	13.6	14.1	14.0	15.6	17.7	17.7	17.7	17.8	18.3	18.4	18.5	18.2	18.7	18.9	19.4
Professional[b]	5.2	6.5	8.6	10.6	12.5	10.8	11.0	11.5	11.7	12.1	12.2	12.3	12.5	12.7	12.9
Personal[c]	3.4	3.5	3.1	3.1	3.4	3.5	3.4	3.6	3.5	3.6	3.5	3.6	3.7	3.7	3.6
Other[d]	0.9	0.9	0.8	0.8	0.9	3.2	3.7	3.6	3.4	3.5	3.5	3.6	3.7	3.8	3.9
Government	12.8	14.1	14.5	14.2	13.9	13.8	13.6	13.8	14.2	14.0	13.7	13.4	13.2	13.0	12.7

[a]Includes communications.
[b]Professional services include business, health, legal, educational, social, and (through 1987) miscellaneous professional services.
[c]Personal services include hotels and lodging, auto repair and services, miscellaneous repair, amusement and recreation, and private household services.
[d]Other services include motion pictures, membership organizations, and (after 1987) other.

NOTE: Shares are based on current dollars.

SOURCES: U.S. Bureau of Economic Analysis, *Survey of Current Business* (August 1996), table 11, and Bureau of Economic Analysis, *National Accounts Data* <<http://www.bea.doc.gov/bea/dn2/gposhr.htm>> (Accessed August 1999).

See pages 7-6 and 9-17 in Volume 1.

Appendix table 9-5.
Percentage of public schools with access to the Internet, and percentage of instructional rooms with access to the Internet, by school characteristics: 1994, 1997, and 1998

School characteristic	Schools			Instructional rooms		
	1994	1997	1998	1994	1997	1998
All public schools	35	78	89	3	27	51
Instructional level[a]						
Elementary	30	75	88	3	24	51
Secondary	49	89	94	4	32	52
Size of enrollment						
Less than 300	30	75	87	3	27	54
300 to 999	35	78	89	3	28	53
1,000 or more	58	89	95	3	25	45
Metropolitan status						
City	40	74	92	4	20	47
Urban fringe	38	78	85	4	29	50
Town	29	84	90	3	34	55
Rural	35	79	92	3	30	57
Geographic region						
Northeast	34	78	90	3	22	39
Southeast	29	84	92	2	26	51
Central	34	79	90	3	33	61
West	42	73	86	5	27	51
Percent minority enrollment						
Less than 6 percent	38	84	91	6	37	57
6 to 20 percent	38	87	93	4	35	59
21 to 49 percent	38	73	91	4	22	52
50 percent or more	27	63	82	3	13	37
Percent of students eligible for free or reduced price school lunch						
Less than 11 percent	40	88	87	4	36	62
11 to 30 percent	39	83	94	4	32	53
31 to 70 percent	33	78	91	3	27	52
71 percent or more	19	63	80	2	14	39

[a]Data for combined schools are included in the totals and in analyses by other school characteristics but are not shown separately.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System (NCES/FRSS), "Advanced Telecommunications in Public Schools, K-12," NCES 95-731; "Advanced Telecommunications in U.S. Public Elementary and Secondary Schools, 1995," NCES 96-854; "Advanced Telecommunications in U.S. Elementary and Secondary Public Schools, Fall 1996," NCES 97-944; "Internet Access in Public Schools, Fall 1998," FRSS 69, 1998.

See page 9-23 in Volume 1.

Appendix table 9-6.
Percentage distribution of 2-year and 4-year higher education institutions according to current or planned offering of distance education courses, by institutional characteristics: Fall 1995 and 1997–98

Institutional characteristic	Currently offering distance education courses		Planning to offer distance education courses in the next 3 years		Not currently offering and not planning to offer distance education courses	
	1995	1997- 98	1995	1997- 98	1995	1997- 98
All institutions	33	44	25	21	42	35
Institutional type						
Public 2-year	58	72	28	19	14	9
Private 2-year	2	6	14	24	84	70
Public 4-year	62	79	23	12	14	9
Private 4-year	12	22	27	25	61	53
Size of institution						
Less than 3,000	16	27	27	26	56	47
3,000 to 9,999	61	75	24	13	15	11
10,000 or more	76	87	14	8	10	5

NOTE: Percentages are computed across each row for each year. Percentages for 1995 are based on an estimated 3,460 higher education institutions, and for 1997- 98 are based on an estimated 3,580 higher education institutions. Percentages may not sum to totals because of rounding.

SOURCES: U.S. Department of Education, National Center for Education Statistics, *Distance Education at Postsecondary Education Institutions: 1997- 98. NCES 2000-013, 1999.*

See page 9-26 in Volume 1

Appendix table 9-7.
Number of different distance education courses offered by 2-year and 4-year higher education institutions in 1994–95 and 1997–98, by institutional characteristics

Institutional characteristics	Total number of distance education courses with different catalog numbers offered in 1994-95[a]	Total number of different distance education courses for any level or audience offered in 1997-98[b]	Number of different college-level, credit-granting distance education courses offered in 1997-98[c]
All institutions	25,730	52,270	47,540
Institutional type			
Public 2-year	10,150	20,210	18,670
Public 2-year	11,470	23,390	20,500
Private 4-year	4,030	8,420	8,120
Size of institution			
Less than 3,000	6,070	13,980	12,090
3,000 to 9,999	7,970	17,020	15,910
10,000 or more	11,700	21,260	19,550

[a] Includes information for the estimated 1,130 higher education institutions that offered distance education courses in fall 1995. The data for 1994-95 were not imputed for item nonresponse. However, there was no item nonresponse for the number of distance education courses offered.

[b] Includes information for the estimated 1,590 higher education institutions that offered any distance education courses in 1997-98.

[c] Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses to make reliable estimates. Data for private 2-year institutions are included in the totals and in size of institutions.

NOTE: Numbers may not sum to totals because of rounding and not reporting where there are too few cases for a reliable estimate.

SOURCES: U.S. Department of Education, National Center for Education Statistics, *Distance Education at Postsecondary Education Institutions: 1997-98. NCES 2000-013, 1999.*

See page 9-26 in Volume 1

Appendix table 9-8.
Percent of 2-year and 4-year higher education institutions offering distance education courses that used selected types of technologies to deliver distance education courses in 1995 and 1997–98, by institutional type

Type of Technology	1995[a] Institutional type[c] All	Public 2-year	Public 4-year	Private 4-year	1997–98[b] Institutional type[c] All	Public 2-year	Public 4-year	Private 4-year
Two-way video with two-way audio (two-way interactive video)	57	49	78	40	56	53	80	31
One-way video with two-way audio	24	18	36	14	14	14	22	3
One-way prerecorded video	52	67	42	30	48	64	44	23
Internet courses using synchronous computer-based instruction	(†)	(†)	(†)	(†)	19	16	22	21
Internet courses using asynchronous computer-based instruction	(†)	(†)	(†)	(†)	60	59	58	66
Two-way online (computer-based) interactions during instruction	14	8	17	25	(†)	(†)	(†)	(†)
Other computer-based technology (e.g., Internet)	22	14	26	38	(†)	(†)	(†)	(†)

† Statistic not estimated for that year.

[a] Based on the estimated 1,130 higher education institutions that offered distance education courses in fall 1995. The data for the 1995 study were not imputed for item nonresponse. However, there was no item nonresponse for for the 1995 study for these technology items.

[b] Based on the estimated 1,590 higher education institutions that offered any distance education courses in 1997- 98.

[c] Data for private 2-year institutions are not reported as a separate type of institution because too few of them in the sample offered distance education courses to make reliable estimates.

SOURCES: U.S. Department of Education, National Center for Education Statistics, *Distance Education at Postsecondary Education Institutions: 1997-98. NCES 2000-013, 1999.*

See page 9-26 in Volume 1

Appendix table 9-9.
Web site prevalence of international government agencies

Institutional Characteristic	Total number of national level Web sites, 1998	Percentage of ministries with Web sites, 1998	Median ministry transparency score, 1998	Median ministry interactivity score, 1998	Sum of transparency and interactivity, 1998	Openness = (T + I) * (percentage of ministries with Web sites), 1998
Afghanistan						
Albania	1	0.06	5.00	1.00	6.00	0.38
Algeria	3	0.13	7.00	1.00	8.00	1.00
Andorra						
Angola	1	0.03	10.00	7.00	17.00	0.59
Anguilla	1	0.08	9.00	2.00	11.00	0.92
Antigua						
Argentina	44	1.00	7.81	3.25	11.06	11.06
Armenia						
Australia	78	0.90	9.54	3.50	13.04	11.73
Austria	58	1.00	8.54	3.50	12.04	12.04
Azerbaijan	2	0.06	6.00	0.00	6.00	0.35
Bahamas						
Bahrain	7	0.29	7.25	1.75	9.00	2.57
Bangladesh	3	0.13	7.00	2.00	9.00	1.17
Barbados						
Belarus	1	0.04	6.00	1.00	7.00	0.25
Belgium	49	1.00	5.83	1.83	7.67	7.67
Belize	2	0.17	10.50	4.40	14.90	2.48
Benin						
Bhutan						
Bolivia	11	0.44	7.30	2.50	9.80	4.29
Bosnia-Herzegovina						
Botswana						
Brazil	57	1.00	8.25	4.00	12.25	12.25
Brunei	11	0.73	8.00	1.00	9.00	6.55
Bulgaria	2	0.20	5.50	2.00	7.50	1.50
Burkina Faso						
Burundi						
Cambodia						
Cameroon						
Canada	171	0.88	6.32	3.83	10.15	8.93
Cape Verde						
Cayman Islands						
Central African Republic						
Chad						
Chile	31	0.94	7.25	2.00	9.25	8.71
China	4	0.17	9.00	1.50	10.50	1.75
Colombia	44	0.94	8.30	2.00	10.30	9.66
Comoros						
Congo						
Costa Rica	3	0.13	9.00	6.00	15.00	2.00
Cote d'Ivoire						
Croatia	6	0.20	5.00	2.00	7.00	1.40
Cuba						
Cyprus	10	0.82	6.00	3.00	9.00	7.36
Czech Republic	10	0.63	5.50	0.40	5.90	3.69
Denmark	29	0.85	14.00	7.40	21.40	18.19
Djibouti						
Dominica	3	0.22	6.25	3.75	10.00	2.22
Dominican Republic						
Ecuador	11	0.47	7.00	2.00	9.00	4.20
Egypt	40	0.41	7.93	2.13	10.06	4.09
El Salvador	1		6.00	1.00	7.00	0.50
Equatorial Guinea						
Eritrea						
Estonia	25	0.73	5.88	1.42	7.29	5.35
Ethiopia						
Fiji	25	0.24	8.00	2.00	10.00	2.35

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 9-9.
Web site prevalence of international government agencies

Institutional Characteristic	Total number of national level Web sites, 1998	Percentage of ministries with Web sites, 1998	Median ministry transparency score, 1998	Median ministry interactivity score, 1998	Sum of transparency and interactivity, 1998	Openness = (T + I) * (percentage of ministries with Web sites), 1998
Finland	19	0.50	10.00	5.50	15.50	7.75
France	65	0.95	11.15	6.16	17.31	16.44
Gabon						
Gambia						
Gaza and Jericho						
Georgia	3	0.10	6.00	1.50	7.50	0.71
Germany	19	1.00	12.00	5.00	17.00	17.00
Ghana						
Greece	17	0.50	5.00	3.00	8.00	4.00
Grenada						
Guatemala	1	0.08	4.00	0.00	4.00	0.31
Guinea						
Guinea-Bissau						
Guyana						
Haiti						
Honduras	3	0.23	6.00	2.00	8.00	1.85
Hungary	12	0.29	10.00	3.50	13.50	3.97
Iceland	13	0.83	8.25	4.50	12.75	10.63
India	81	0.37	7.10	2.00	9.10	3.33
Indonesia	28	0.52	6.00	2.00	8.00	4.13
Iran	6	0.04	7.00	2.00	9.00	0.39
Iraq						
Ireland	26	1.00	11.50	5.00	16.50	16.50
Israel	115	1.00	6.00	2.67	8.67	8.67
Italy	64	1.00	8.75	4.00	12.75	12.75
Jamaica						
Japan	39	0.76	7.17	2.00	9.17	6.98
Jordan	16	0.24	10.42	3.00	13.42	3.22
Kazakhstan	1					
Kenya						
Kiribati						
Korea, North						
Korea, South	22	0.74	10.50	5.00	15.50	11.42
Kuwait	21	0.58	7.00	2.50	9.50	5.50
Kyrgyzstan						
Laos						
Latvia	11	0.53	4.00	1.00	5.00	2.65
Lebanon	20	0.36	6.44	2.00	8.44	3.07
Lesotho						
Liberia						
Libya						
Liechtenstein						
Lithuania	4	0.14	3.50	0.50	4.00	0.57
Luxembourg	66	0.73	8.50	3.00	11.50	8.36
Macedonia	1	0.06	8.00	3.00	11.00	0.61
Madagascar						
Malawi						
Malaysia	67	0.75	5.17	1.00	6.17	4.63
Maldives	1	0.06	9.00	1.00	10.00	0.63
Mali						
Malta	33	1.00	8.00	3.50	11.50	11.50
Mauritania						
Mauritius						
Mexico	19	0.67	8.50	3.00	11.50	7.67
Micronesia						
Moldova						
Monaco	1	0.25	8.00	8.00	16.00	4.00
Mongolia						
Morocco	24	0.48	8.00	2.00	10.00	4.78

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 9-9.
Web site prevalence of international government agencies

Institutional Characteristic	Total number of national level Web sites, 1998	Percentage of ministries with Web sites, 1998	Median ministry transparency score, 1998	Median ministry interactivity score, 1998	Sum of transparency and interactivity, 1998	Openness = (T + I) * (percentage of ministries with Web sites), 1998
Mozambique						
Myanmar (Burma)						
Namibia						
Nauru						
Nepal	3	0.07	6.75	2.25	9.00	0.67
Netherlands	44	1.00	9.09	6.00	15.09	15.09
New Zealand	37	0.86	8.50	3.25	11.75	10.15
Nicaragua						
Niger						
Nigeria						
Norway	54	1.00	10.00	7.00	17.00	17.00
Oman	17	0.43	7.78	3.00	10.78	4.68
Pakistan	29	0.75	3.50	0.00	3.50	2.63
Palau						
Panama	1	0.07	8.00	3.00	11.00	0.79
Papua New Guinea						
Paraguay	9	0.58	5.00	1.00	6.00	3.50
Peru	28	0.88	7.56	2.00	9.56	8.37
Philippines	20	0.52	7.00	1.00	8.00	4.17
Poland	10	0.29	4.50	1.00	5.50	1.62
Portugal	48	1.00	10.00	3.90	13.90	13.90
Qatar	15	1.00	7.50	2.00	9.50	9.50
Romania	13	0.12	5.50	1.00	6.50	0.75
Russia	6	0.20	6.00	2.10	8.10	1.62
Rwanda						
Saint Kitts and Nevis						
Saint Lucia						
Saint Vincent & the Grenadines						
San Marino	6	0.55	7.00	3.00	10.00	5.45
Sao Tome and Principe						
Saudi Arabia	3	0.14	10.00	1.00	11.00	1.57
Senegal	1	0.04	7.00	1.00	8.00	0.33
Seychelles						
Sierra Leone						
Singapore	22	0.86	7.58	1.50	9.08	7.79
Slovakia	4	0.17	6.00	3.00	9.00	1.50
Slovenia	31	0.62	6.00	1.62	7.62	4.72
Soloman Islands						
Somali Republic						
South Africa	4	0.11	10.00	5.00	15.00	1.67
Spain	30	0.93	10.00	5.00	15.00	13.93
Sri Lanka	24	0.29	8.00	1.50	9.50	2.76
Sudan						
Suriname						
Swaziland						
Sweden	24	1.00	6.00	2.50	8.50	8.50
Switzerland	50	1.00	8.67	4.50	13.17	13.17
Syria						
Taiwan	110	1.00	7.87	2.60	10.47	10.47
Tajikistan						
Tanzania						
Thailand	23	0.87	8.00	1.33	9.33	8.08
Togo						
Tonga	1	0.09	5.00	2.00	7.00	0.64
Trinidad and Tobago	1					
Tunisia	2	0.07	7.50	2.00	9.50	0.70
Turkey	31	0.67	10.00	4.83	14.83	9.89
Turkmenistan						
Tuvalu						

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 9-9.
Web site prevalence of international government agencies

Institutional Characteristic	Total number of national level Web sites, 1998	Percentage of ministries with Web sites, 1998	Median ministry transparency score, 1998	Median ministry interactivity score, 1998	Sum of transparency and interactivity, 1998	Openness =(T + I) * (percentage of ministries with Web sites), 1998
Uganda	1	0.05	2.50	0.00	2.50	0.11
Ukraine	1					
United Arab Emirates	14	0.30	8.92	4.00	12.92	3.88
United Kingdom	76	0.95	9.10	4.00	13.10	12.50
United States	205	1.00	10.33	5.64	15.96	15.96
Uruguay	21	0.60	7.00	2.67	9.67	5.80
Uzbekistan	14	0.33	2.30	1.00	3.30	1.10
Vanuatu	3					
Vatican	3	0.25	8.00	3.00	11.00	2.75
Venezuela	13	0.21	8.00	3.17	11.17	2.33
Vietnam						
Yemen, Republic of	3	0.10	7.00	1.00	8.00	0.80
Yugoslavia						
Zaire						
Zambia						
Zimbabwe						

NOTE: Openness via the world wide web is defined here to have two components open to evaluation: Transparency and Accessibility. Transparency is the information provided about the agency in question, i.e., the revelatory value of the content. Accessibility is the convenience of interacting with this information, i.e., the convenience of the pipeline's interactivity. See <<http://www.cyprg.arizona.edu/hypo_content.htm>> for complete definitions of these concepts.

SOURCE: Cyberspace Policy Research Group, <<http://www.cyprg.arizona.edu>>.

See figure 9-25 in Volume 1.

Appendix table 9-10.
Annual labor earnings percentiles of adult males in 1997 CPI-U dollars, selected years: 1973–1995

*n*th Percentile	1973	1975	1978	1980	1985	1990	1995
5	15,148	14,064	14,090	13,264	12,049	11,649	11,913
10	19,199	18,840	18,540	18,128	15,448	15,532	16,245
15	22,359	21,923	22,036	22,107	18,537	18,061	19,494
20	24,958	24,515	24,896	24,318	21,627	20,710	21,925
25	27,646	27,021	27,280	27,413	24,580	23,298	24,909
30	30,718	29,300	29,875	29,845	27,775	25,887	25,992
35	32,638	32,230	31,782	32,940	29,516	28,864	28,158
40	34,557	34,184	34,579	35,151	32,440	31,446	30,324
45	37,886	36,169	37,079	37,583	34,989	33,653	32,598
50	39,165	39,067	39,728	39,793	37,846	36,630	36,281
55	42,237	41,346	42,376	42,112	40,164	38,831	38,988
60	45,681	43,950	45,025	44,436	43,253	42,714	42,454
65	47,248	46,229	47,673	47,531	46,343	45,381	45,486
70	49,916	48,834	50,878	50,847	49,258	49,919	49,818
75	53,756	52,089	53,632	53,500	52,522	54,363	54,150
80	57,596	56,647	58,267	57,479	57,156	58,246	60,648
85	64,507	61,856	65,153	64,112	61,897	64,718	68,229
90	74,874	71,623	74,158	71,186	74,148	77,661	81,225
95	92,153	87,901	92,698	88,430	92,685	98,371	105,593

SOURCE: Panel Study on Income Dynamics.

See page 9-19 in Volume 1.