Contract N00014-85-G-0131

1986 PROGRAM REPORT

on

THE ARMY-NAVY INITIATIVE
in the
NATIONAL CAPITAL AREA

in support of

THE DEPARTMENT OF DEFENSE SCIENCE AND ENGINEERING APPRENTICESHIP PROGRAM FOR HIGH SCHOOL STUDENTS

Administered by
The University of the District of Columbia
under a Grant from the Office of Naval Research
on behalf of

THE DEPARTMENT OF THE ARMY AND THE DEPARTMENT OF THE NAVY

November 1986

Submitted by:

Marylin Krupsaw, Program Director
Physics Department, CPSET
Center for Applied Research

DISCLAIMER NOTICE

THIS DOCUMENT IS BEST QUALITY PRACTICABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

Center for Applied Research and Urban Policy
University of the District of Columbia
4200 Connecticut Avenue, N.W.
Building 48, Suite 510
Washington, DC 20008
(202) 282-3156

Contract N00014-85-G-0131

Approved for Public Release. Distribution Unlimited.
Per Dr. Mildred W. Scott, University of the District of Columbia

The Center for Applied Research and Urban Policy at the University of the District of Columbia was established in 1984 to relate the intellectual resources of the university to the needs of the District of Columbia, urban populations and institutions, and people generally neglected by our society. The Center undertakes research, policy analysis, technical assistance, program evaluation and holds conferences, forums and seminars on a wide range of issues.

TABLE OF CONTENTS

DoD

SCIENCE AND ENGINEERING APPRENTICE PROGRAMS

1986

University of the District of Columbia

OVERVIEW

The Science and Engineering Apprentice Programs are sponsored by the Department of Defense and administered by the University of the District of Columbia. These consist of three programs with complementary goals. Essentially, these programs follow the objectives established for all of the Department of Defense Apprentice programs.

1. SEAP

The original Science and Engineering Apprentice Program (SEAP) places high school students with scientist mentors in DOD laboratories for an eight-week period during the summer months.

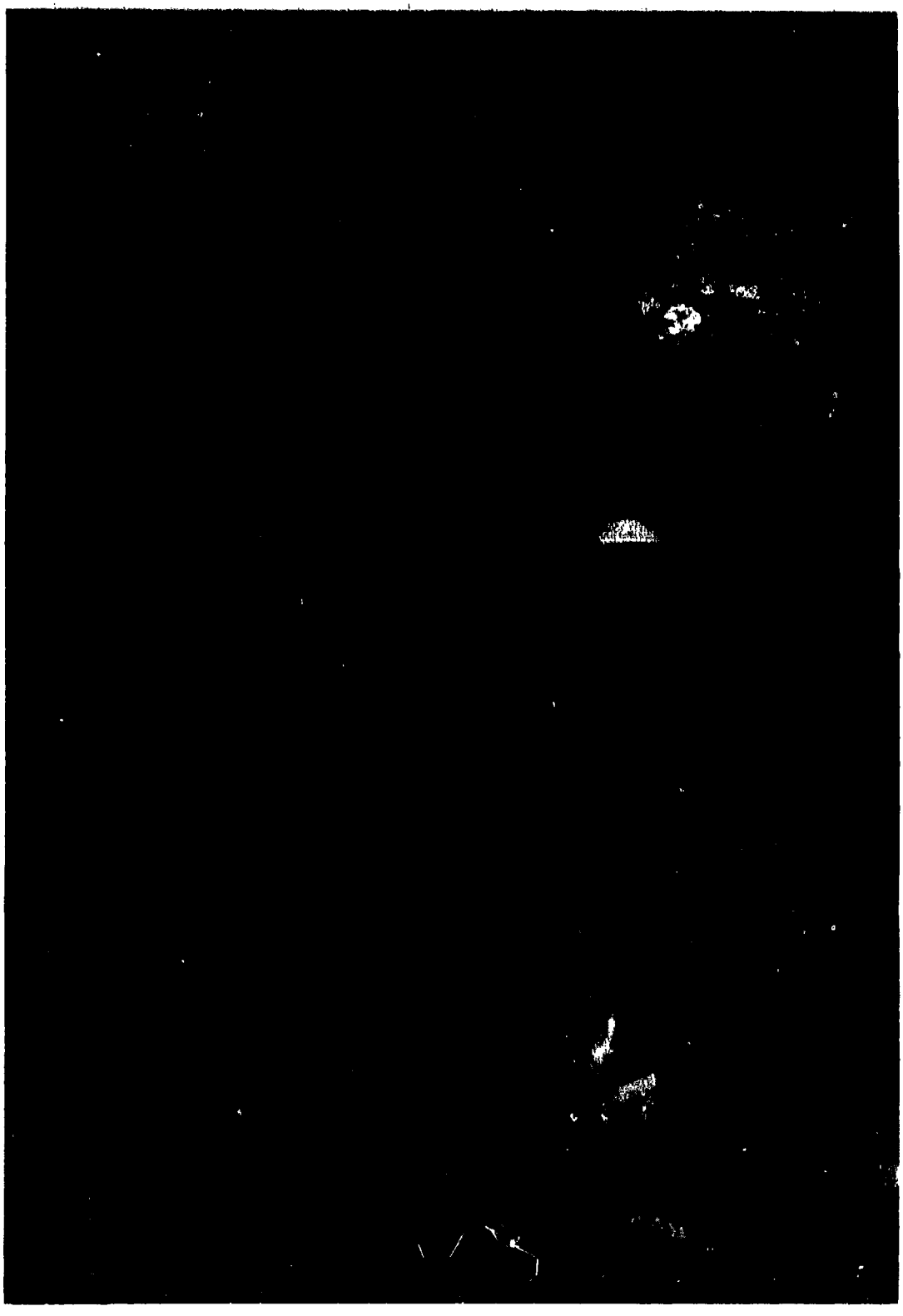
2. TNT

Teachers Networking in Technology (TNT) presents an on-campus graduate course for area science teachers during the spring semester and a follow-up laboratory research experience in DoD installations during the summer.

3. STARS

The Science, Technology and Research Students (STARS) program exposes D.C. Public School seventh and eighth grade students to an intense, three-day immersion in career possibilities in science.

All three of the above-mentioned programs will be discussed individually in the report that follows.



PART I. SEAP (For high school students)

PROGRAM DESCRIPTION

For the period 16 June through 15 August, 1986, four hundred seventy-four apprentices were placed at 17 Army and Navy laboratories mostly in the National Capital area. These students came from 12 schools in the District of Columbia, 30 in Virginia, 63 high schools located in Maryland, and 8 different high schools in Alabama. A site in Huntsville, Alabama was added this year as a pilot program. We hope to expand this program nationwide.

Students worked a full eight-hour day, five days a week during the program, with new students receiving a stipend of $1100, second-year students $1150 and those who were participating for a third year, $1200. Approximately $529,250 was allotted and paid in stipends.

This program for high school students attracts academically able students who have shown achievement and potential in mathematics and science. In addition, it is mindful of the mission of trying to attract students who have not necessarily preselected scientific careers, but who have the ability and potential for such achievement, including previously underrepresented segments of the population. As stated in the University's proposal, this experience is designed to encourage students who show promise in science and mathematics to:

* reach a better understanding of research through an apprenticeship under the direction of DoD scientists, engineers and mathematicians;

* become familiar with a wide variety of career choices, challenges and opportunities and the educational requirements;

* gain some understanding of the use of new scientific and engineering equipment and techniques not available in their school environment;

* continue to pursue their scientific interests with a view toward government service;

* serve as positive role models for their peers who have not been aware of the challenges and rewards of scientific careers; and

* increase the representation of minorities and women in scientific fields.

Apprentice activities were supported in the laboratory by the assistance of more than 378 research scientists. Many of the students were able to work with several scientists on more than one type of investigation.

The first day of the program, the students attended orientation at the University of the District of Columbia to meet agency representatives, program personnel and fellow participants. Claude A. Ford, Acting President of UDC, welcomed the high school students and Professor Marylin Krupsaw greeted them before they relaxed and enjoyed the excellent keynote speech by Captain James O'Donovan, USN, Commanding Officer, Naval Research Laboratory (NRL). He explained the aims of the program and encouraged each student to put forth his or her best to get the most out of the experience. Dr. David Moran, Research Coordinator, David Taylor Naval Ship Research and Development Center delivered an inspirational speech encouraging the students to identify some on-the-job problem and think of interesting and creative possible solutions.

The apprentices were exposed to a wide range of experiences in numerous fields such as those of laser technology and applications, betatron accelerator experiments, basic research in electron structure and kinetics, cancer studies, immunology, environmental, oceanographic and pollution studies. Appended is a list of the 1986 program participants and a brief description of their areas of investigation. The descriptions demonstrate the variety and sophistication of the experiences that were made available to the apprentices.

During the course of their eight-week exposure, apprentices were afforded the opportunity to utilize the educational facilities of the laboratory including the library, video-taped courses and academically-oriented seminars.

"Brown Bag" Seminars were a regular feature which allowed students to interact informally with scientists and other apprentices. Tours to several other research facilities were conducted, including trips to the Naval Surface Weapons Center, David Taylor Research and Development Center and the Harry Diamond Laboratory.

Cross-agency seminars were held between the Naval Medical Research Institute, the Uniformed Services University of Health Sciences, Walter Reed Army Institute of Research and the Armed Forces Institute of Pathology to permit student interaction and insight into the medical research areas of those agencies. Students from NSWC spent a day touring the Goddard Space Flight Center and visiting the NASA high school summer students at their job sites.

At a session on August 14 at the Washington Navy Yard, Dr. Jerome Karle, Nobel Laureate for Chemistry and chief scientist of the Laboratory for the Structure of Matter at the Naval Research Laboratory, was guest speaker. His advice to the apprentices to stick to their goals and accept hard work added to his fascinating and interesting discussion of his research topic. After the formal presentation he spoke of his career and academic background to many students in small groups. Vice Admiral Samuel L. Gravely, Jr., USN (Retired), presented awards to four outstanding apprentices on behalf of the AFCEA (Armed Forces Communications and Electronics Association) Education Fund, as did Capt. Arthur H. Sass, USNR, on behalf of the Washington Academy of Sciences. A special award in honor of Dr. David Venezky (Chief Scientist, Office of Naval Research, London) was presented to a student from the Chemistry Division of NRL by Dr. Noel Turner.

The final day of the program, 15 August, the apprentices, parents, mentors, teachers, friends, and agency representatives were invited to the Van Ness Campus of the University of the District of Columbia and greeted by Marylin Krupsaw, Program Director, at the closing ceremonies. Dr. Vijaya Melnick, Acting Director of the Center for Applied Research, welcomed the gathering on behalf of UDC. Dr. Hamed M. El Bisi, Associate Director, Army Research and Technology, spoke to the group about current basic research representing the cutting edge of technology that is being done in the national capital area, and reminded the students that we look to them to carry on and continue this vital endeavor. Dr. Leo Young, Director, Office of the UnderSecretary of Defense for Research and Engineering, spoke of career and future opportunities in the sciences, and then introduced the featured speaker, Lieutenant General James A. Abrahamson, Director, Strategic Defense Initiative, (Star Wars) Office of the Secretary of Defense. General "Abe" spoke of the unique and positive experiences the apprentices will receive in their respective fields of interest, while at the same time encouraging their pursuit of technical careers in science and engineering. General Abrahamson was given a standing ovation for his stimulating presentation and for his dedication to the youth of America.

Afterwards, the apprentices convened in small group sessions and presented the results of their research efforts to their peers and guests. The event concluded with a working luncheon with agency representatives, mentors, teachers, and staff evaluating the summer's activities and making recommendations for improving the program.

PARTICIPATION BY DISCIPLINE

The distribution of students according to discipline is fairly arbitrary since basic research can be multidisciplinary.

However, the breakdown does provide some idea of the focus of the placements.

DISTRIBUTION ACCORDING TO DISCIPLINE

Engineering	155
Biology, Medical	80
Computer/Mathematics	113
Psychology	2
Chemistry	72
Physics	52
Total	474

SELECTION OF PARTICIPANTS

Information and applications were mailed to 406 area high schools in November of 1985 and received in-house early in 1986. Four Hundred seventy-four students were placed with the various agencies between March and June of 1986. Almost 5000 students responded to the notice about the program.

Almost all who submitted applications were qualified because of selective screening in the high schools. The few who were ineligible were not U.S. citizens. The criteria used in the selection of students were:

1. Courses taken (advanced placement, college preparatory, other);

2. Previous participation in the program. (Approximately 39 percent of the students accepted had participated in the program before);

3. Grades obtained and ability and achievement on standardized test scores;

4. Teachers' recommendations;

5. Student's interest, achievements, and extracurricular accomplishments in science-related programs;

6. Geographic location and individual ability to commute to the laboratory; and

7. Reason student gave for wanting to participate.

The 474 students were placed with the participating laboratories as follows:

DISTRIBUTION BY LABORATORY

ARMY LABORATORIES	NUMBER OF STUDENTS
Armed Forces Institute of Pathology	11
Army Research Institute	15
Ballistics Research Laboratory	40
Belvoir Research & Development Center	25
Chemical Research & Development Center	50
Engineering Topographic Laboratory	7
Ft. Detrick - USAMRDL	8
Harry Diamond Laboratories:	
Adelphi	13
Woodbridge	1
Night Vision & Electro-Optics Lab	4
United States Missile Command Center	22
Walter Reed Army Institute of Research	49
Subtotal	255

NAVY LABORATORIES	NUMBER OF STUDENTS
David Taylor Naval Ship Research & Development Center:	
Bethesda	12
Annapolis	11
Navy Medical Research Institute	13
Naval Research Laboratory	85
Naval Surface Weapons Center:	
White Oak	33
Dahlgren	25
Uniformed Services Univ. of Health Sciences	20
U.S. Naval Academy	13
U.S. Naval Observatory	7
Subtotal	219
TOTAL PARTICIPANTS	474

Administrators in the laboratories rendered indispensable assistance in recruiting scientists to serve as mentors, developing student's assignments, arranging enrichment activities, and facilitating the smooth operation of the program in general. These people deserve our deepest gratitude and our utmost praise.

Armed Forces Institute of Pathology	Ms. Deborah Montgomery
Army Research Institute	Ms. Janice Watts
Ballistics Research Laboratory	Mr. George Klem
Belvoir Research & Development Center	Ms. Joyce Burwell
Chemical Research & Development Center	Mr. Robert Gavlinski
David Taylor Naval Ship Research & Development Center	Ms. Jill Priest
Engineering Topographic Laboratory	Mr. George Simcox Ms. Beulah DeShields
Ft. Detrick (USAMBRDL)	Mr. Joseph Hise Ms. Patricia Schafer
Harry Diamond Laboratories	Mr. Jeffrey Newman
Naval Medical Research Institute	Dr. Michael Ackerman
Naval Research Laboratory	Ms. Nancy Lowry
Naval Surface Weapons Center	Mr. Michael Antos Ms. Dorothy Seabolt
Night Vision and Electro-Optics Laboratory	Ms. Mikki Collins
Uniformed Services University of Health Sciences	Dr. David Forman
U.S. Missile Command Center	Dr. Katie Blanding

U.S. Naval Academy----------Ms. Noreen Rice

U.S. Naval Observatory----------Dr. Gart Westerhaut
Ms. Laura Charron

Walter Reed Army Institute
of Research----------Dr. James McNeil

The members of the staff and their responsibilities were as follows:

Professor Marylin Krupsaw, Physics Department, University of the District of Columbia, is the Director and was responsible for the coordination of the activities of the program.

Ms. Mary L. Phillips, Center for Applied Research and Urban Policy, University of the District of Columbia, served as the grants administrator and assisted in the coordination of activities.

Ms. Nancy Butler, Center for Applied Research and Urban Policy, University of the District of Columbia served as the office assistant.

Dr. Allen Barwick teaches physics at Woodrow Wilson High School in the District of Columbia public school system. He served as counselor in charge of David Taylor Naval Ship Research and Development Center, Bethesda.

Dr. Anthony Donfor teaches physics at the University of the District of Columbia. He served as counselor in charge of Belvoir Research & Development Center, Night Vision and Electro-Optics Laboratory, and Engineering Topographic Laboratory.

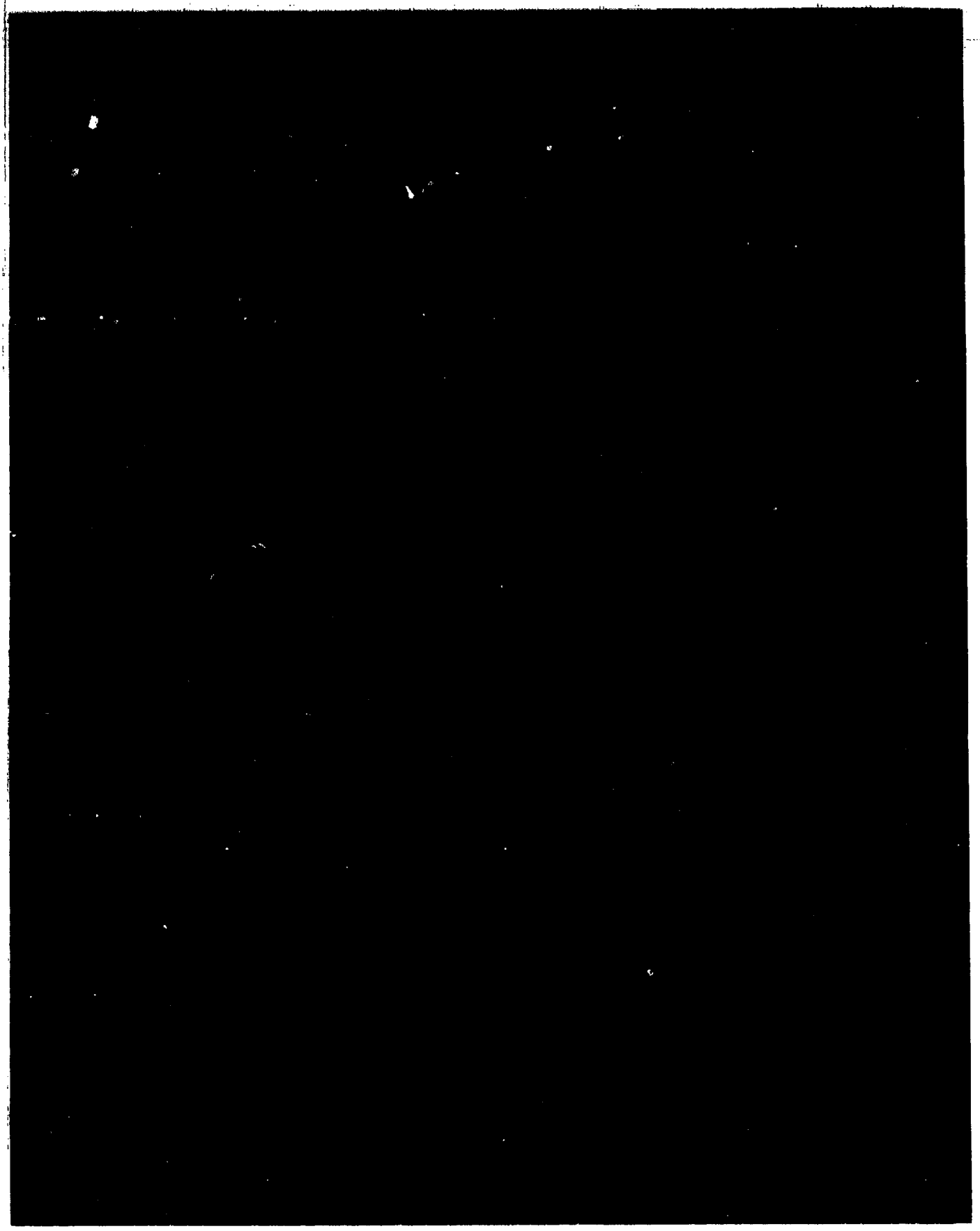
The experience with Teachers Networking for Technology high school science teacher program showed the value of utilizing the close relationship between apprentices and teachers at as many as of the laboratories as possible.

This summer the following high school science teachers served as counselors in addition to performing their own research:

Armed Forces Institute of Pathology	Ms. Adel Gorden Walt Whitman High School Montgomery County, MD
Army Research Institute	Mrs. W. Lee Cox South Lakes High School Fairfax County, VA
David Taylor Naval Ship Research & Development Annapolis	Ms. Elaine Johnson LaPlata High School Charles County, MD
Harry Diamond Laboratories Adelphi	Ms. Ruth A. Wallace MacFarland Junior High School Washington, DC
Naval Research Laboratory	Mr. Peter F. Corro George Washington Junior High School Alexandria, VA
	Mr. Frank Hancock Archbishop Carroll High School Washington, DC
Naval Surface Weapons Center White Oak	Mr. Robert Willis Schools without Walls Washington, DC
	Ms. Emma Johnson Buchanan Secondary School Washington, DC
Dahlgren	Ms. Ethyl DuBois Oxon Hill High School Prince George's County, MD

Uniformed Services University of Health Science	Miriam Worthing Holton Arms High School Montgomery County, MD
	Mr. Michael McGuire St. Vincent Palotti Prince George's County, MD
United States Missile Command Center	George Williams Calhoun Community College Huntsville, AL
United States Naval Observatory	Ms. Patricia McKinstry McLean High School Fairfax County, VA
Walter Reed Army Institute of Research	Ms. Melodye A. Garner Eleanor Roosevelt High School Prince George's County, MD
	Mr. Matt Halverson Lake Braddock High School Fairfax County, VA
	Ms. Charlotte Hutton Spingarn High School Washington, DC

We want to thank the DoD personnel involved and other dedicated volunteers who helped to make this program possible.



EVALUATION

BASIS FOR EVALUATION

Evaluation of the program involved both compilation and abstraction of the written reports of the students which were reviewed by the mentors (acknowledged by mentor signatures), by the counselors and by the director, as well as the statistical analysis of the evaluation forms completed by both mentors and students, assessing their experience. Copies of the mentor form and the student evaluation form are attached, and a summary of comments made by both with respect to various aspects of the program may be found in the following section.

PLACEMENTS

Applications were considered on the basis of the criteria mentioned previously. The scientists who agreed to become mentors interviewed several aspirants and made the final selection. In a few instances the interviews were conducted on the telephone because of the need to expedite placement. Each mentor was provided with the student's application form, transcript, letter of recommendation from a science or mathematics teacher and a paragraph written by the applicant describing interests and activities in science outside of the classroom. Each installation was provided with three to five times the number of applications as there were positions to be filled. If the group of applications submitted did not satisfy the requirements of the laboratory, additional applications were supplied.

ANALYSIS OF MENTOR EVALUATION FORMS

The mentor evaluation form was designed to gather the reactions of the scientists to the program and the way it was conducted. It also requested information on the individual student who worked with the mentor and the mentor's opinions regarding needed changes in any program area.

We were pleased to note that over 72 percent of the mentors felt that the students were making a contribution to the work of the laboratory and that less than 1.1 percent felt that the students they worked with failed to perform as well as they expected. Almost 90 percent indicated that they would accept the same student in their laboratory another summer.

Mentor and agency representative suggestions resulted in the application form shown in the Appendix. The addition of a commitment form signed by both student and parent to ensure that

the total eight-week experience be maintained helped prevent last minute drop-out and unauthorized midsummer vacations.

Some mentor comments on the program were:

"I feel this program is worthwhile and beneficial to the future of both the individual and the laboratory. The only problem we experienced is the age limitation of 18 to engage in most of our type of activity."

"I am concerned about the overemphasis placed on the students to write/discuss topics (often technical) that are grossly out of their 'bounds.' Instead, their reports should reflect their learning experiences which focus on experimental approach, test design observation, data collection/formatting, i.e, 'The Experimental Cycle.' This, in practice, would result in a truer indicator of the quality of students and success of the DoD program."

"Requested the same student because of her work the previous year. Assignment was intended only to develop her problem solving abilities and to teach her a new computer programming language. She did much more."

"My student actually contributed more than I expected. This year I had high expectations, which have been exceeded."

"I think this is a great program. It does require time from the mentor, but it is well worth it. Keep it going!"

"Our office does not perform research, but the student contributed a lot to the special projects on which she worked this summer."

"An additional two weeks would be very helpful with regard to what can be accomplished."

"The student has shown a maturity and understanding which is advanced for his years. We hope he will return next year."

"It would be helpful if we understood more about the program objectives and what sort of experiences the program would like to see the student have."

"The work performed by this student during her SEAP work period represented the equivalent output of a senior Co-op student or a junior engineer. In addition, she was able to proceed independently on her assigned engineering tasks with a minimum of instruction. This is the first year that our Code has participated in the SEAP program. Our experience this summer has been very positive, in major part due to this student's performance. The branch engineers are enthusiastic concerning this

student's contributions and are looking forward to next year's program. We would certainly like to have her back with the branch next summer and would provide our highest recommendations to schools or future employers."

"We did not have time to interview and this student did not show as much enthusiasm, concentration, or care as the one last year. We could use a time-line for mid-summer and final activities also."

"It was a very good idea to have the teacher on site, and also have her own project."

"I have had contact with two SEAP program students (only one as mentor) and found them both enthusiastic and very talented. One student is now a senior EE major at the University of Maryland and has worked at HDL five summers in a row, with a high probability that he will return to a full time position after graduation. Based on these experiences I believe the program to be very worthwhile, and only wish I participated when I was in high school."

"It is an excellent program. We wish we had more space to accept more students and teachers each summer."

All of the mentors' comments and suggestions will be taken into consideration in planning the 1987 program.

ANALYSIS OF STUDENT QUESTIONNAIRE

The student questionnaire was divided into five sections. In the first section, the apprentices were asked to indicate the extent to which they were exposed to any or all of 16 different experiences. Major areas of exposure were:

Q6. Measurement techniques: to which 72% of the students indicated a lot of exposure and 23% indicated some exposure.

Q8. Data analysis (with or without computer assistance): 88% said they had received a lot or some exposure.

Q9. Computer programming: 45% said they received a lot of exposure and another 48% said some.

Q12. Teamwork in scientific research: 31% said they experienced a lot or some of the feeling of teamwork.

Q13. Use of advanced scientific equipment: 96% of the students received a lot or some exposure.

Q14. Other students with similar interests and goals: Although only 15% of the students responded "a lot," another 31%

indicated "some" and there were several student comments about the program being the only way to be exposed to such peers. (See student comment extraction.)

In Section II, the students were asked to evaluate the contribution the program had made to their own personal development in the light of 10 choices.

Almost all of the students cited a strong contribution in all 10, with working with adults and peers and job responsibility showing the most influence, and getting ideas to be investigated further on their own, the least.

When asked to what extent they benefited from various activities of the program, talks with their mentor was far and away the highlight of the student's summer experience, including formal lectures, informal talks, and explanation of the work. The response to questions regarding their satisfaction with the summer experience was overwhelmingly positive. Ninety-one percent found this to be an academically challenging experience and 95% stated this was personally rewarding in every way. Some of the comments of the students are shared below to provide some insight into the concerns and aspirations of the apprentices.

When asked, "What did you like most about the program?"

"The friendliness and helpfulness of the employees that I worked with, getting a feel for the way that the government operates and using computers to retrieve information quickly."

"I enjoyed being right next to engineers as they conducted their job duties."

"The way apprentices were brought in and welcomed into the laboratory. I think it's a great experience. A lot can be learned just from the atmosphere."

"The helpful people working in the lab. I felt comfortable asking questions. I had the opportunity to gather my own data through experimentation. You get paid for gaining an education. Through this program and the guidance of my mentor, I decided to change my major in college to science."

"I liked the exposure to the research experience. It helps you decide if you like what it takes to research an unknown. I also appreciated the experience in the work world."

"I enjoyed the job experience because it gave me an overview of what different careers are like and what is involved in each."

"I liked working with adults and talking with them about the career decisions they made when they were my age."

"I enjoyed the opportunity to apply scientific principles from school and a chance to meet new people and work on a scientific project."

"The experience I received was invaluable."

"Dealing with technical equipment and computers and acquiring a sense of responsibility from concerned professionals."

"The exposure to various scientific and chemical operations and the educational stipend."

"The program gave me an excellent insight into the government 'workworld' and engineering opportunities. I feel that there will be many engineering positions to be filled in the future.

"The chance to work with experienced engineers and learn about the various different jobs and experiments used in research."

"The professional manner with which my mentor treated me, and the knowledge and experience I gained."

"It gave me an opportunity to see first-hand what a certain field of scientific research was like and to contribute something to it."

"The program gave me a better exposure to computer languages. I learned much more in eight weeks on the computer than I did in two years of school computer science."

"I liked the idea of placing people my age into the business community. With this experience behind me, I now know what will be facing me in my future career plans."

"I enjoyed the opportunity to create and explore without regard to my mistakes. I think that the program provided this setting along with the mentors who devoted their time this summer."

"The fact that students were actually allowed and encouraged to use lab equipment and participate in the ongoing work."

"I liked the working atmosphere and the openness of the scientists towards me. Also I liked how soon information was given to us by our teacher about program activities."

"The sense of achievement it gives you when you complete a responsible and difficult assignment."

"The opportunity to further my scientific knowledge by working on 'up-to-date' research programs."

"I liked working in a scientific environment and having my mentor teach me on a one-to-one basis."

"The program was the opportunity of a lifetime. It combined an educational experience with the ability to earn funds for college."

"The thing I liked most was the experience this job gave me working with adults in a professional situation and learning more about computer programming. This program offers a great opportunity to high school students, and I hope it is available in the years to come."

"On the other hand, when asked "what did you like least", there were all too many of the following comments:

"Not having security clearance made it difficult to know what we could or couldn't do or see."

"The one thing that did disturb me about this program is that it ends when the student enters college. This was my first year here, and since I am entering college this fall, I will probably not have a chance to work here again because of the 'sons and daughters' ruling. I feel as if I may have wasted some of my mentor's time if I can't come back next summer to continue my work."

"I didn't have enough work to do."

"Writing a report before finishing the project."

"Not busy enough."

"Too short a time. Barely started to work and it was over and we had to write a report about what we did."

"The required report format. To summarize what I did this summer I feel would be better without the limitations of a set format. High points could be included and points of interest touched upon only slightly."

"Writing the report."

"The program should somehow be longer."

"The amount of time I had with nothing constructive to do."

"In my area of work, you must be certified to perform any of the sampling and monitoring procedures. This restricted me to only observing my mentor's work on monitoring--although I did the calibration for the instruments and helped analyze the results."

"At my lab, time and the absence of a security clearance prevented me from having more of a role in the ongoing work."

"Not having enough activities and work planned for me. My mentor was away a good bit of the time."

"There was not enough for me to do. What I did do was great, but I could have done more."

"The only disadvantage to the program was that I did not have many, if any, peer experiences. All of the people I worked with were older than I am."

"The mentor went on vacation and thought he had left enough work. I finished and felt as though I was being cheated because there was so much more I could have done."

"Not being able to really get to know the other students well enough. We should have had some more special functions. Some of the other students were great."

"Writing the paper may have been an important part of my education as far as skill in communicating, but it was much harder work than the rest."

"Why can't this kind of program continue throughout the school year?"

"Some brown bag seminars were good--some were duds. Couldn't there be more lunches with apprentices from other labs?"

Student comments will be given consideration during the planning of 1987 program.

TRACKING

The effectiveness of this program must be measured against how many of these students continue on to college, how many complete degrees in science, how many find employment in the science field and how many return to a DoD laboratory in one capacity or another.

A trial tracking system was initiated and will be continued hereafter on a bi-yearly basis to follow participants, as far as possible.

One of the problems in fulfilling this important aspect of the entire program is the fact that the financial support for this project is of inconsistent origin. Success depends upon the continuity of personnel and that is dependent on a funding process that should be smooth-flowing from year to year.

RECOMMENDATIONS

1. Mailing lists should include all teachers who haveparticipated in the DoD teacher program in addition to the head of the science department in each high school, each superintendent of schools, and science supervisors in each of the areas surrounding the participating laboratories.

2. Completed applications should be distributed at a mentor meeting in each installation in March or April. All potential mentors will receive mentor handbooks and may ask questions. Program procedures and benefits can be made more explicit at such a meeting and individual questions answered directly.

3. Agency contact continuity would facilitate early selection, security processing and student-mentor association. In some laboratories this program is dumped on someone in the personnel department who rotates away before the program ends. There should be a scientist or education specialist as program contact at each laboratory.

4. We need a follow-up mechanism whereby students who have participated in this program and proven their value to the laboratory, evidenced by the mentor's request for their return, could be more smoothly enrolled in a direct-hire program. The paperwork, including time and effort by laboratory personnel divisions, results in the loss of many of our best students who have already been so well trained in the laboratory. Perhaps this program could handle such placements also.

COMPLIANCE WITH THE CIVIL RIGHTS ACT OF 1964

No applicant was discriminated against because of race, creed, or sex.

PARTICIPANT DEMOGRAPHICS

American Indian	2
Asian American/Pacific Islander	58
Black	40
Hispanic	2
White	321
No Answer	51
TOTAL	474

PARTICIPATION BY SEX

Male	276
Female	182
No Answer	16
TOTAL	474

PARTICIPATION BY GRADE LEVEL AND AGE

GRADE	AGE	TOTAL # OF STUDENTS
Ninth	14	7
	15	2
Tenth	14	10
	15	55
	16	22
Eleventh	15	12
	16	163
	17	24
Twelfth	16	6
	17	145
	18	27
	19	1
	TOTAL	474

The following list shows the geographic distribution of participants:

PARTICIPANTS BY STATE AND HIGH SCHOOL

District of Columbia High Schools

Ballou	3
Benjamin Banneker	4
Browne Junior High School	1
Georgetown Day	1
Gonzaga College	4
National Cathedral	2
Rabaut Junior High School	1
St. Albans	2
St. Anselm's Abbey	2
St. John's College	1
Sidwell Friends	4
Theodore Roosevelt	1
Woodrow Wilson	3
TOTAL WASHINGTON DC STUDENTS	33

MARYLAND SCHOOLS

Anne Arundel High Schools

Annapolis	6
Andover	2
Chesapeake	8
Glen Burnie	6
Meade	2
Old Mill	1
Severna Park	4
South Bend River	2
Total	31

Baltimore County High School

Perry Hall	4

Cecil County High Schools

Perryville	3
Rising Sun	6
Total	9

Lauderdale County High School

West Lauderdale	1

Calvert County High School

Northern	1

Charles County High Schools

Lackey	1
LaPlata	1
Maurice McDonough	3
Total	5

Frederick County High Schools

Brunswick	1
Frederick	3
Johnson	2
Middletown	1
Walkersville	1
Total	8

Harford County High Schools

Aberdeen	13
Bel Air	10
C. Milton Wright	21
Edgewood	3
Fallston	10
Harford Christian	3
Harve De Grace	5
John Carroll	9
Joppatowne	4
North Harford	6
Total	84

Howard County High Schools

Altholton	1
Centennial	2
Glenelg	2
Hammond	2
Oakland	1
Total	8

Montgomery County High Schools

Academy of Holy Cross	1
Albert Einstein	1
Bethesda-Chevy Chase	3
Charles E. Smith Jewish Day	1
Connelly School	2
Gaithersburg	2
Georgetown Preparatory	1
Good Counsel	1
Holy Cross Academy	5
Holton Arms	1
John F. Kennedy	5
Magruder	7
Montgomery Blair	3
Newport Preparatory	3
Paint Branch	6

Montgomery County High Schools Cont'd

Richard Montgomery	1
Rockville	2
Seneca Valley	4
Sherwood	1
Springbrook	7
Stone Ridge	1
Thomas Wooton	8
Walt Whitman	7
Walter Johnson	1
Wheaton	1
Winston Churchill	3
Yeshiva of Greater Washington	1
Total	79

Prince George's County High Schools

Bishop MacNamara	4
Crossland	3
Eleanor Roosevelt	23
Frederick Douglass	1
High Point	4
LaReine	3
Northwestern	2
Oxon Hill	37
Parkdale	1
Regina	2
Robinson	3
Saint Vincent Pallotti	1
Surrattsville	5
Total	89
TOTAL MARYLAND STUDENTS	319

VIRGINIA SCHOOLS

Arlington County High School

Bishop O'Connell	3

Alexandria High Schools

Bishop Ireton	3
T.C. Williams	8
Saint Agnes	1
Saint Mary's Academy	1
Total	13

Fairfax County High Schools

Annandale	2
Brookfield	1
Falls Church	1
Hayfield	2
James Robinson	3
J.E.B. Stuart	3

Fairfax County High Schools Cont'd

Lake Braddock	9
Langley	2
Madeira	1
McLean	2
Mount Vernon	3
Oakton	8
Thomas Jefferson	2
West Potomac	4
West Springfield	9
W.T. Woodson	2
Total	54

Fredericksburg High School

James Monroe	4

King George County High School

King George	1

Prince William County High Schools

Brentsville District	3
Gar-Field	8
Osbourn	1
Total	12

Richmond County High School

Rappahanock	1

Saint Mary's County High School

St. Mary's Ryken	1

Spotsylvania County High Schools

Courtland	1
Spotsylvania	2
Total	3

Stafford County High School

North Stafford	3

Westmoreland County High School

Colonial Beach	1

TOTAL VIRGINIA STUDENTS 95

ALABAMA SCHOOLS

Limestone County High Schools

Ardmore	1
Athens	2
East Limestone	1
Tanner	1
Total	5

Madison County High Schools

Hazel Green	1
Huntsville	3
Randolph	3
Virgil I. Grissom	2
Total	9

Morgan County High Schools

Albert P. Brewer	2
Decatur	3
Falkville	1
Hartselle	2
Total	8

TOTAL ALABAMA STUDENTS 22

OTHER STATES HIGH SCHOOLS

York (Pennsylvania) County High School

Kennard-Dale	1

Lancaster (Pennsylvania) County High School

Solanco	1

Rockingham (New Hampshire) County High School

Phillips Exeter Academy	1

Newcastle (Delaware) County High School

Newark	1

Seminole (Florida) County High School

Lake Brantley	1

TOTAL OTHER STATES STUDENTS 5

PART II. TNT (TEACHERS NETWORKING IN TECHNOLOGY)

PROGRAM DESCRIPTION

In order to ensure an adequate science and engineering personnel base and to improve the technological literacy of the nation, the Department of Defense felt it essential that public and private secondary school teachers enhance student motivation and performance in science. To this end, the University of the District of Columbia offered a two-phase program for teachers in conjunction with the functioning Science and Engineering Apprentice Program for High School Students.

We know that the high school science teacher serves as a center of influence to encourage young people to take more interest in science, and can help to identify students who have the attributes suitable for such careers at the earliest possible time. This experience enabled the teacher to act as catalyst in the process of strengthening the teaching of science in our schools.

The first phase of the program consisted of a three-semester-hour graduate-level, concentrated course which could be used toward meeting re-certification requirements. This course, entitled "New Technology in the Science Classroom for Teachers," was designed to provide secondary school science teachers with an awareness of recent changes in chemistry and physics curricula, teaching methods, instrumentation, technology, and psychological motivation methods as they pertain to senior high school courses. Basic principles, laws, experimental evidence, and experiences that support the principles and laws were covered. Invited guest lecturers brought topics from the classroom to current usage and research indicating trends toward the future. Field trips to participating laboratories, such as the Naval Research Laboratory and Harry Diamond Laboratory, were an integral part of the course. At the DoD laboratories, lectures on specific topics were given by scientists who wished to be involved with the program and work with a teacher during the summer. Teachers were encouraged to bring students with them on these field trips.

During the second phase of the program, those teachers who successfully completed the spring semester program were selected to participate in a three-credit summer institute consisting of eight weeks of on-site laboratory research experience in a DoD laboratory. During the course of the eight weeks, teachers had an opportunity:

* To pursue an area of research under the guidance of a DoD scientist as mentor.

* To be responsible for the daily operation of the SEAP program at assigned laboratories.

including visiting each student individually and meeting each mentor personally.

* To schedule weekly "brown bag" seminar sessions at each laboratory.

* To prepare, abstract, and present a research paper at the University's final session.

As stated in the University's proposal, the underlying purpose was to kindle among the teachers an excitement about science and engineering career opportunities for young people in civilian and uniformed military service and private sector defense service. Its primary purpose is to enhance the teachers' perceptions of science and engineering and help them become centers of influence to guide appropriate young people into possible careers in science and engineering. Teachers received a summer stipend of $2,800 and were required to write a research paper for additional graduate credit.

In addition to the opening and closing ceremonies at UDC for all participants, a closing ceremony for the teachers was held at the Washington Navy Yard Officers' club. Each teacher was awarded a certificate for the successful completion of the "New Technology in the Science Classroom for Teachers" course.

SELECTION CRITERIA

Applications were mailed to area high schools along with the student applications. All teachers were required to be U.S. citizens. The criteria used for selection were:

* regional representation

* subject area

* teacher need (how long out of school)

PARTICIPATING TEACHERS

Listed below are the teachers actually selected to participate in the program along with the schools they represent.

Brendon S. Bailey, Jr.	Lake Braddock High School Burke, VA
Robert E. Clemmons	Gar-Field Senior High Woodbridge, VA
Peter F. Corro	George Washington Junior High Alexandria, VA
Ethyl A. duBois	Oxon Hill High School Oxon Hill, MD
Melodye A. Garner	Eleanor Roosevelt High School Greenbelt, MD
Adel C. Gorden	Walt Whitman High School Bethesda, MD
James M. Halverson	Lake Braddock High School Burke, VA
Frank W. Hancock	Archbishop Carroll High School Washington, DC
Charlotte C. Hutton	Spingarn Senior High School Washington, DC
Elaine R. Johnson	LaPlata High School LaPlata, MD
Emma J. Johnson	Buchanan Secondary Washington, DC
Michael A. McGuire	Saint Vincent Pallotti Laurel, MD
Ronald D. Sperlbaum	Oxon Hill High School Oxon Hill, MD
Ruth A. Wallace	MacFarland Junior High School Washington, DC
Perry Williams	Roosevelt High School Washington, DC

Miriam K. Worthing — Holton Arms High School, Bethesda, MD

Patricia A. McKinstry — McLean High School, McLean, VA

Robert R. Willis — School Without Walls, Washington, DC

PART III. STARS (Science, Technology and Research Students)

PROGRAM DESCRIPTION

The Project "STARS" Program, (Science, Technology and Research Students), initiated for junior high school students, gives bright seventh and eighth grade students the opportunity to attend three days of science career-influencing activities at the Maritime Institute of Technology and Graduate Studies (MITAGS) in Linthicum, Maryland. Participants come from the public schools in the District of Columbia.

During their stay at MITAGS, the students were taught by the MITAGS personnel and the program staff to use computers and library research facilities and were given demonstrations of five computer simulation areas in MITAGS, including ship handling, radar identification, liquid fuel cargo control, engine room operations, and cryogenic facilities and experienced the same type of problems that the ship's masters and mates are required to solve for promotion and renewal of licensing. The students were also given lecture/demonstrations by scientists who explained facets of their specific career fields, areas of research, types of academic preparation necessary, and future prospects. Since several of these scientists were products of many of the same schools the students attend in the District, the effect was truly inspiring.

The enthusiastic response of these students back in their classrooms, their written evaluations, the pre-/and post-test scores on standardized psychological tests, and the overwhelmingly positive reaction on the part of all adults involved has resulted in another such seminar being planned this fall. The funding that had been included in the original SEAP grant will be able to cover the second session due to the fact that everyone involved contributed to this venture without compensation. Also, each lecturer and scientist who volunteered his or her time has already agreed to plan to join us again in this worthwhile endeavor in November.

As a follow up of the "Project STARS" program, these students will be eligible to attend Saturday and summer sessions of UDC's "YES" program (Youth in Engineering and Science) and the Saturday Academy, and will be invited to attend one of the regularly scheduled seminars at NRL (Naval Research Laboratory) during the summer SEAP program to join our high school students at the lab for an afternoon.

Basically, this program follows the objectives established for the DoD Science and Engineering Apprentice Program (SEAP). This program is for junior high school students who are academi-

rally able who have shown achievement. It is mindful of the mission of trying to interest more students in scientific careers, particularly those who have the ability and potential including previously under-represented segments of the population. Overall, this experience is designed to encourage students who show promise to:

* become familiar with a wide variety of career choices, challenges and opportunities in science and the educational requirements;

* gain some understanding of the use of new scientific and engineering equipment and techniques not available in their school environment;

* serve as positive role models for their peers who have not been aware of the challenges and rewards of scientific careers; and

* encourage bright students, with an emphasis on females and minorities, to seek careers in the field of science and engineering.

SELECTION OF PARTICIPANTS

Information was disseminated throughout the junior high schools in the District of Columbia requesting that qualified students be selected to participate in the "STARS" program.

Students participating were selected by school counselors or science teachers based upon their grades, participation in class, prior achievements, and extracurricular accomplishments.

PARTICIPATION BY RACE AND SEX

No applicant was discriminated against because of race, creed, or sex. Participation by race and sex is shown below.

PARTICIPANT DEMOGRAPHICS

Race	Males	Females
Black	12	12
White	1	-
Hispanic	1	-
Total	14	12

TOTAL PARTICIPANTS 26

PARTICIPATING "STARS" STUDENTS

Name	School
Amey, Donald T.	Sousa Jr. High
Battle, Tashua N.	Rabaut Jr. High
Beaty, Ebonie D.	Backus Jr. High
Beasley, Darren	Rabaut Jr. High
Blackford, Joseph P.	St. Anselm's Abbey School
Bradley, Monira L.	Rabaut Jr. High
Bradley, Robbie L.	Backus Jr. High
Evans, Ursula A.	Rabaut Jr. High
Gerald, Nicola	Paul Jr. High
Gordon, Frankie	Keene Jr. High
Headley, Tanya M.	Alice Deal Jr. High
Jennings, Toskeka L.	Shaw Jr. High
Johnson, Ayo H.	Browne Jr. High
Mack, Racquel M.	Alice Deal Jr. High
Mack Jr., Willie	Alice Deal Jr. High
Nwakti, Ngwah-mbo	Sousa Jr. High
Neira, Miguel	Alice Deal Jr. High
Renard, Kristen A.	Hobson Middle School
Richards, Mariama L.	Alice Deal Jr. High
Spells, Marcus M.	Fort Lincoln Jr. High
Strange, Alfred T.	Brent Jr. High
Thompson, Michael L.	Fort Lincoln Jr. High
Thompson, Tanya M.	Rabaut Jr. High
Weithers, Hugh O.D.	Alice Deal Jr. High
Witherspoon, Esaie T.	Westland Intermediate School
Wood, Sean	Rabaut Jr. High School

ANALYSIS OF STUDENT QUESTIONNAIRE

Students were administered two questionnaires. The first questionnaire, Interest Determination, Exploration, and Assessment System (IDEAS) developed by Charles B. Johansson, listed activities related to various careers. Students were asked to show how much they liked or disliked each type of activity by circling "L" for "liked the activity very much," "l" for "liked it somewhat," "I" for "indifferent" or "undecided," "d" for "disliked it somewhat," and "D" for "disliked the activity very much." The test resulted in showing each student his or her own profile to help him or her better understand his or her interests.

The second questionnaire was a self-description inventory, also developed by Charles B. Johansson, which listed 200 adjectives used in describing people. Students were asked to describe themselves by accurately responding to each adjective with "Y" for "Yes," "S" for "Sometimes," and "N" for "No."

Because there is such a small sample to date, a detailed analysis of the questionnaires from the July 1986 session of the "STARS" program will be included in the 1987 results.

TRACKING

In order to reveal the effectiveness of the "STARS" program and show in what ways this program can be enhanced, follow-up information will be gained on participating students. We are primarily interested in the status of the students' grades in math and science courses in school, the degree of their participation in other science- and math-oriented programs, and also Science Fair participation.

We have assurance that, under the guidance of Superintendent Floretta Dukes McKenzie, the Counseling Division of the District of Columbia Public Schools will provide this information for us on a bi-yearly basis.

PARTICIPATING COUNSELORS AND TEACHERS

Dorothea Hunter	Sousa Junior High
Marylin Krupsaw	University of the District of Columbia
Mary Phillips	University of the District of Columbia
Robert Wood	Cardoza High
Gloria White	Backus Junior High School

GUEST LECTURERS

John Bobb, Director, MITAGS Academic Programs
Dr. George Curruthers, NRL
Dr. Harold Eaton, NRL
Mr. Brenda Holmes, NRL
Dr. Howard Jones, HDL
CPO James Layman, USN
Capt. Arthur Sass, NRL
Dr. Dolores Walker, NRL
Dr. Raymond Watts, MITAGS Computer Facility
Dr. Conrad Williams, NRL
Mr. Robert Wood, MITAGS Planetarium
Capt. John Underhill, MITAGS Staff

Dr. Jerome S. Paige, University of the District of Columbia
Dr. Marie M.B. Racine, University of the District of Columbia

SYLLABUS OF PROJECT "STARS" CURRICULUM AT THE
MARITIME INSTITUTE OF TECHNOLOGY

Tuesday July 22, 1986

11:30 - Room Assignments, unpack, tour of facilities
12:00 - Lunch
1:30 - Welcome (In Library)
Prof. Marylin Krupsaw, "STARS" Director
Capt. Arthur H. Sass, USNR, NRL
Mr. John Bobb, Academic Director, MITAGS
1:45 - Lecture/Demonstrations
Group 1 - Space/Science, Dr. George Carruthers, NRL
Group 2 - Naval Technology, CPO James Lyman, USN
Group 3 - IBM Personal Computer Usage, Thomas Nolan, MITAGS Instructional Staff
4:00 - Break
Swimming
Computer Usage
Library Research
6:00 - Dinner
7:30 - Lecture/Demonstration
Chemistry, Brenda Holmes, NRL
9:30 - Night Snack
9:45 - Visit to the MITAGS Planetarium
Mr. Robert Wood, DCPS
10:45 - Preparation for bed
11:30 - Night Lunch

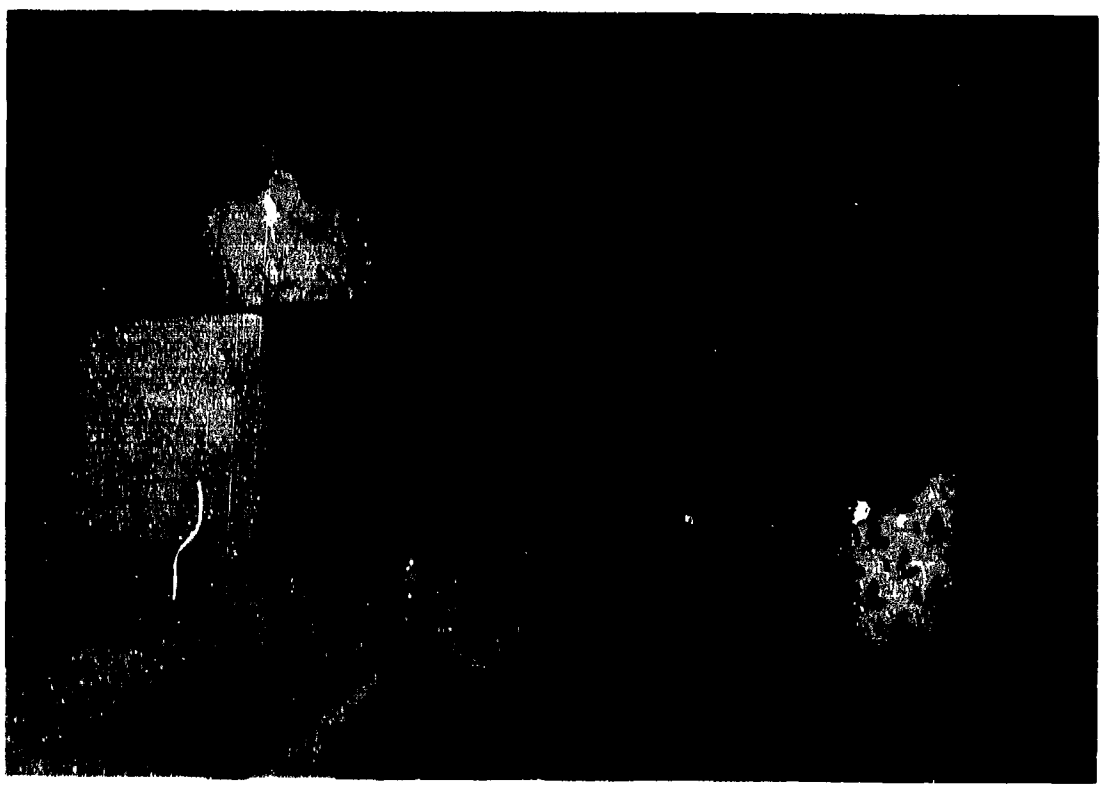
Wednesday July 23, 1986

8:00 - Breakfast
8:30 - Visit to the MITAGS Planetarium
Captain John Underhill, MITAGS Staff
9:30 - Tour of Control Room, Ship Handling, Liquid Handling, and Engine Room Simulators
Dr. John Bobb, Director, MITAGS Academic Programs
12:00 - Lunch
1:30 - Lecture/Demonstrations
Group 1 - Cryogenics, Dr. Conrad Williams, NRL
Group 2 - Electronics, Dr. Howard Jones, HDL
Group 3 - Photovoltaics, Dr. Dolores Walker, NRL
4:00 - Break
Swimming
Computer Usage
Library Research

6:00 - Dinner
Program Overview - Capt. Arthur H. Sass, NRL
7:00 - Lecture/Demonstration
Careers in Chemistry, Dr. Harold Eaton, NRL and Kiko Eaton
9:00 - Computer Usage
Library Research
10:00 - Recreation room
Ping pong
Swimming
10:45 - Preparation for bed
11:30 - Night Lunch

Thursday July 24, 1986

8:00 - Breakfast
9:00 - Visit to the MITAGS Planetarium
Captain John Underhill, MITAGS Staff
10:00 - Tour of Radar and Cryogenic Simulators
Dr. John Bobb, Director, MITAGS Academic Programs
11:00 - Student Presentations of Library Research Reports
12:00 - Lunch
1:30 - Preparation for Departure



APPENDIX A
SEAP STUDENT RESEARCH ASSIGNMENTS

ARMED FORCES INSTITUTE OF PATHOLOGY
AGENCY CONTACT
Ms. Deborah Montgomery
AFIP-EDZ
Washington, DC 20306
(202) 576-2939

Bunte, Elizabeth M.
Mentor: Dr. Glenn N. Wagner
Holy Cross Academy
Montgomery County, MD

Researched technique used and purpose for extracting and storing of cadaver blood for transfusion and its advantages and usefulness in hopes to dispel some of the myths.

Bunte, Suzanne B.
Mentor: 1T J. Kevin Baird
Holy Cross Academy
Montgomery County, MD

Identified parasite, Ascaris lumbricoides, in human tissue and evaluated anatomic location, diameter, morphologic features, and histopathologic changes.

Corrado, Janene M.
Mentor: Ms. Leona Fischer
Bishop Dennis J. O'Connell High School
Arlington County, VA

Extracted and entered pertinent information for malpractice cases into the legal medicine data entry system.

Egan, Laura A.
Mentor: Dr. William J. Mehm
Stone Ridge Country Day School of the Sacred Heart
Montgomery County, MD

Experiments were performed on the effects of varied oxygen partial pressures on the phagocytic and adherence functions of mouse adherent splenic macrophages.

Fayer, Robert S.
Mentors: Col Richard Henderson
Dr. William J. Mehm
MSgt. Dennis Hutchings
Mr. George Liu
Atholton High School
Howard County, MD

Determined P_{O_2} in cell culture media exposed to altered atmospheric parameters (pressure and gas composition) by using oxygen electrodes to study the effects of hyperbaric/hyperoxidictherapy at the cell level.

Graves, Gizelle A.
Mentor: Ms. Patricia C. Patel
Academy of the Holy Names
Montgomery County, MD

Updated the existing on line Integrated Library System by inputting copy information and created item records in the computer.

Heltzer, James M. Mentor: Dr. Sobin Sidwell Friends School Washington, DC	Studied the principles of morphometry to measure the DNA content of cell nuclei which can be corollated with the malignancy of a tumor.
King, Duane E. Mentor: Dr. Michael A. Clark Saint Vincent Pallotti High School Prince George's County, MD	Extracted pertinent information from suicide case reports and entered into a database for analysis and comparison of suicides to determine cause of death.
Rastogi, Vineeta Mentors: CPT Kuhlman LT Edion D. Hart Seneca Valley High School Montgomery County, MD	Evaluated a high-pressure liquid chromatograph (HPLC) procedure for possible application of the HPLC method in studying the urinary excretion of chlorpheniramine and pseudoephedrine to determine the cause of death.
Santini, Patrick P. Mentor: Ms. Debbie Bottazzi Bishop McNamara High School Prince George's County, MD	Learned various staining methods used by the Histopathology laboratory; used stain method (H+E) and worked up special stains then coverslipped and prepared them to be sent to the pathologists.
Szapary, Christopher B. Mentors: Mentors: CPT Kuhlman LT Edion D. Hart Georgetown Preparatory School Montgomery County, MD	Evaluated a high-pressure liquid chromatograph (HPLC) procedure in order to apply the HPLC method in studying the urinary excretion of chlorpheniramine and pseudoephedrine to determine the cause of death.
Ventre, Kathleen M. Mentor: Dr. Donald G. Wright Academy of the Holy Cross Montgomery County, MD	Studied the legal importance of forensic autopsy in isolating cause and manner of death in the investigation of suicide cases.

ARMY RESEARCH INSTITUTE
AGENCY CONTACT
Ms. Janice Watts
5001 Eisenhower Avenue
Alexandria, VA 22333
(703) 274-7822

Hennett, Matthew J.
Mentor: Mr. Samuel Essey
Oxon Hill High School
Prince George's County, MD

Provided support for the operations of the Information Management Directorate in the Real Time Support Laboratory using the VAX mainframe system and making video tape presentations.

Chandler, Charles E.
Mentor: Dr. Richard Gebhard
Lake Braddock Secondary School
Fairfax County, VA

Wrote and tested a computer based instructional system, Microticcit, in which a learning sequence is modified automatically in response to the individual student's response pattern.

Chin, Linda Y.
Mentor: Mr. Theo-dric Feng
West Springfield High School
Fairfax County, VA

Designed a database to organize information; used a database management system in which data was manipulated and then applied in report writer utility to produce the desired tabular reports and charts.

Flynn, Shannon C.
Mentors: Ms. Jocelyn Turner
Ms. Daria Sneed
Saint Mary's Academy
Alexandria County, VA

Applied cognitive psychology to individual learning modes for students studying Lotus to better organize effective computer assisted learning procedures.

Fraser, Douglas R.
Mentor: Dr. Marshall Narva
James W. Robinson Secondary
Fairfax County, VA

Recreated on the Apple IIe a project from a symbolics computer that demonstrates how to simplify maps and display specific information.

Gallivan, Martin D.
Mentor: Mr. Joseph Duval
Bishop O'Donnell High School
Arlington County, VA

Learned VAX FORTRAN computer language to write a program to provide smooth computer access for psychology researchers to data from Army Officers' files.

Malek-Mohamadi, Cyrus
Mentor: Mr. Joseph Duval
Oakton High School
Fairfax County, VA

Used Microsoft BASIC to modify Lotus data files with a spreadsheet program and VAX 11 PASCAL to add to and modify the MAAX-VAX program mission area analysis experimental taxonomy, using a rule based systems analysis procedure.

Medici, Catherine A.
Mentor: Mr. Joseph Duval
Brentsville District High School
Prince William County, VA

Used C language to create a terminal emulation program which would connect computers by an asynchronous line to transfer files for a war game entitled SIMCOM, which is a voice recognition system.

Narva, Sandra M.
Mentor: Dr. Glenda Nogami
Thomas S. Wootton High School
Montgomery County, MD

Used a Statistical Analysis system to analyze the reasons why soldiers decide to separate from the army and chart trends.

Rossi, Jeffrey A.
Mentor: Dr. Paul Twohig
West Springfield High School
Fairfax County, VA

Assisted in the development of a leadership evaluation system used to aid in the personal development of leadership skills through the Engineering Officers Advanced Course.

Singla, Rohit K.
Mentor: Ms. Karen Stach
West Springfield High School
Fairfax County, VA

Used Digital Command Language and FORTRAN to write an on-line users manual for an existing data dictionary of the Officer's Master File, and the DEC remote Instruction Set (REGIS) to complete an extensive graphics module for the ARI Task Management System. VAX BASIC was used to complete a menu-driven reference program for the Scientific Engineering and Systems Division.

Snead, Anthony D.
Mentor: Mr. Bob Epps
Gonzaga College High School
Washington, DC

Translated programs from DCL to VAX BASIC and modified them to limit use of system resources during run time and to lessen the amount of memory space required. Co-authored a menu program to display the projects that have been completed by ARI's Science and Engineering Systems Division.

Speaker, Francine M.
Mentor: Mr. Herman Spencer, Jr.
Oxon Hill High School
Prince George's County, MD

Studied Oracle, a relational database system, as a tool for record keeping in the business world.

Straight, Laura E.
Mentor: Dr. John Stewart
Bar-Field Senior High School
Prince William County, MD

Tested subjects on the recognition of armored vehicles and their cognitive complexity on a computer tutorial called CASTE (Course Assembly and Tutorial Environment) and compared results with previous data.

Tran, Bac H.
Mentor: Mr. Joseph Severo
J.E.B. Stuart High School
Fairfax County, VA

Software programs were developed to produce graphic layouts including spacial design and wiring schematics for a local area network.

BALLISTICS RESEARCH LABORATORY
AGENCY CONTACT
Mr. Howard Walter
AMXBR-SECAD
Aberdeen Proving Grounds, MD 21005-5066

Bowers, Ronald A.
Mentor: Mr. Stephen Polyak
Aberdeen High School
Harford County, MD

Evaluated a commercial program to establish its practicality as a tool to produce preliminary performance data for threat aircraft. Converted a program to determine the probability of engine failure due to fuel ingestion from Applesoft™ BASIC to Hewlett-Packard 9845B BASIC.

Bowers, Steven A.
Mentor: Mr. Jerry Watson
Aberdeen High School
Harford County, MD

Heated a sample of nitrocellulose in several different gaseous atmospheres in order to determine if these gases would interfere with a solid propellant burn.

Bruchey, Nathaniel D.
Mentor: Mr. Mark L. Bundy
John Carroll High School
Harford County, MD

Constructed plots for previous shroud test by using prerecorded data; acquired drafting skills and also wrote programs in FORTRAN using the VAX/VMS computer system.

Bruchey, William J.
Mentor: Mr. William Kokinakis
John Carroll High School
Harford County, MD

Read high speed films to obtain cavity measurements and the computer processing of data to analyze results.

Case, Robert M.
Mentor: Mr. John Saccenti
Bel Air High School
Harford County, MD

Worked on developing, coding, and debugging a program to perform radioactive calculations functions for the U.S. Army Radcon Team; also became acquainted with the Unix system at BRL.

Cockerham, Gene P. Mentor: Mr. Earl Weaver Aberdeen High School Harford County, MD	Assisted in conducting tests on missiles to determine the basic pattern, size, and shape of fragments produced when warheads were detonated. These tests were designed to estimate damage inflicted on enemy aircraft in an air-to-air combat situation.
Corriggio, Anthony M. Mentor: Mr. George Coutler Aberdeen High School Harford County, MD	Constructed a 1/1315 scale 11' x 11' model to simulate the mountainous terrain surrounding the Reiteralpe large-scale blast simulation facility in West Germany.
Edge, Ritchie J. Mentor: Ms. Doris L. Sinclair Aberdeen High School Harford County, MD	Wrote FORTRAN programs using the UNIX and NOS operating systems; learned how to clean, certify, and degauss computer tapes using Data Devices Mark 200, the Tester, Century 22 and a Bell and Howell TD29048.
Fotia, Kelli L. Mentor: Mr. John C. Dumer, III Edgewood High School Harford County, MD	Wrote PASCAL programs to translate ISO FORTRAN and ALGOL algorithms into PASCAL subroutines for future use in a non-parametric expert system. Also test-ran Calcstar, a spreadsheet package to give demonstrations.
Green, John R. Mentors: Mr. Berry Reichard Mr. Sam Chamberlin Aberdeen High School Harford County, MD	Used the SUN microsystems computer to create various tactical field and combat symbols for use with the BRL Army/Darpa distributing communications and professing experiment.
Hess, Catherine Mentor: Mr. Paul Tannenbaum Bel Air High School Harford County, MD	Developed a comparison of the database programs on the IBM-PC and UNIX computer systems by crating databases in DBASE III, and INGRES from the data collected on tanks and other vehicles and projectiles.

Holub, David
Mentor: Mr. John Walter
Aberdeen High School
Harford County, MD

Redesigned a UNIX termap entry for specific use with the Data General One (DG1), a portable computer. Also designed a database and wrote a user interface program for use in the retrieval of vulnerability data.

Holub, Richard A.
Mentor: Mr. Irvin Stobie
Aberdeen High School
Harford County, MD

Conducted research to determine the ignition characteristics of liquid propellants in closed chamber testing. Measured and recorded pressure to determine the effectiveness of the primer and ignition systems.

Hughes, Christine L.
Mentor: Mr. Anthony Baran
C. Milton Wright High School
Harford County, MD

Developed a computer simulation consisting of a ray trace program to understand focusing properties of an optical system, including single lenses and multiple lenses. Studied focusing properties to determine how the eye perceives objects at near and far distances as well as off axis.

Hughes, Raymond E.
Mentor: Dr. James Walbert
C. Milton Wright High School
Harford County, MD

Measured the vibration of a cantilever beam subjected to an impulse load by using an accelerometer, then transferred data to a micro-computer where it was analyzed.

Kazi, Aaron
Mentor: Dr. R. Snidman
C. Milton Wright High School
Harford County, MD

Modified and extended a target model database used in radar analysis utilizing knowledge of graphics software, UNIX operating system and graphics vectrix displays. Also learned C programming language.

Klopfic, Joel T.
Mentor: Mr. Arpad A. Juhasz
John Carroll High School
Harford County, MD

Used the PDP/11 system to obtain burning rates and pressure vs. time traces for different types of solid propellant and the application of an inhibitor to obtain a simple burning pattern and facilitate the calculation of burn rate.

Levin, Norman P. Mentor: Dr. Brinton Cooper Fallston High School Harford County, MD	Developed a computer simulation to evaluation Chase's soft decision rank decoding algorithm on single-parity check product codes subject to gaussian noise, with the idea of extending it to more complex block codes such as Hamming codes.
Lutz III, John I. Mentor: Mr. Edmund Baur Bel Air High School Harford County, MD	Assisted in furnishing an electronic trailer with nicolet analog to digital converters and electronic equipment. Described how to set up and run the equipment inside the trailer for future use.
McCool, Kelly M. Mentor: Dr. George F. Adams Perry Hall High School Baltimore County, MD	Used Grafmaker subroutines written from precision visuals which developed graphs defining the similarity between the experimental and theoretical values of vibrational frequencies and infrared intensities. Developed FORTRAN equivalents of Cray scientific library subroutines.
McDowell, Arwen E. Mentor: Dr. Mark Kregel Rising Sun High School Cecil County, MD	Studied calculus as a precise mathematical method for defining interrelationships among objects and used differential calculus to develop a model of a Chesapeake Bay ecosystem.
Meredith, Annette M. Mentor: Dr. Richard A. Beyer Bel Air High School Harford County, MD	Observed studies of liquid propellant and examined liquid propellant reactions when heated at different pressures. Also, learned FORTRAN and PASCAL computer programming languages.

Novak, Mark J. Mentor: Mr. George Klem C. Milton Wright High School Harford County, MD	Examined input parameters of an image reconstruction program for the purpose of creating the best possible images of simulated projection data. Determined that modifying the tolerance factor produced the greatest change in the output data.
Nuzman, Julianne Mentor: Mr. Monte Coleman Aberdeen High School Harford County, MD	Wrote pre-processing program in FORTRAN 77 to facilitate the use of a stepwise multiple linear regression program and replaced Hollerith data with character data in the regression program.
Park, Edward J. Mentor: Dr. George F. Adams John Carroll High School Harford County, MD	Used Grafmaker subroutines written from precision visuals which developed graphs defining the similarity between the experimental and theoretical values of vibrational frequencies and infrared intensities. Developed FORTRAN equivalents of Cray scientific library subroutines.
Potter, William H. Mentor: Ms. Lynn M. Vigliante Perryville High School Cecil County,MD	Completed computer translations of ISO FORTRAN algorithms into programs which execute in the turbo PASCAL environment.
Raff, Jeffrey R. Mentor: Dr. George G. Adams C. Milton Wright High School Harford County, MD	Used Grafmaker subroutines written from precision visuals which developed graphs defining the similarity between the experimental and theoretical values of vibrational frequencies and infrared intensities. Developed FORTRAN equivalents of Cray scientific library subroutines.

Santilli, Thomas F. Mentor: Mr. James E. Schall Harford Christian School Harford County, MD	Worked on Cyber and UNIX computer systems using the FORTRAN language and the BRL's Army Unit Resiliency Analysis methodology to analyze the vulnerability of army units, military targets, and weapons systems.
Scott II, V. Stanley Mentor: Mr. Richard Romanelli Bel Air High School Harford County, MD	Assisted in the installation and maintenance of computers, computer terminals, printers, and data links throughout BRL's compound.
Seibert, Jr., David C. Mentor: Mr. Michael J. Nusca Havre de Grace High School Harford County, MD	Wrote FORTRAN computer programs which ran on the VAX 780 and 8600 computers using the VMS operating system for the comparison of numerical calculations for a spinning and cloning liquid-filled cylinder.
Simmermon, David C. Mentor: Mr. James C. Ford Newark High School New Castle County, DE	Investigated potential enhancements to the standard M16A2 rifle to determine any design flaw in the day optical device and potential improvement.
Springer, David T. Mentor: Mr. Bernard Guidos C. Milton Wright High School Harford County, MD	Used the VAX 11/780, VAX 11/8600, CYBER and TAG, a piece of software used on the VAX 11/780 and VAX/8600 computers to plot graphs.
Stine, Donna M. Mentor: Ms. Doris I. Sinclair Havre de Grace High School Harford County, MD	Operated the data device, the tester, the Century 22 and the Mark 200 machines in the tape library. Also helped to transfer temporary tapes to permanent storage.
Street, Karen Mentor: Mr. Richard Romanelli Kennard-Dale High School York County, PA	Worked in data communications and made cables for and hooked up new computer lines. Repaired problems with existing computer lines and dismantled the HEP super computer.

Taylor, Howard W.
Mentors: Mr. Gerald Anderson
Mr. Robert Reschly
Havre de Grace High School
Harford County, MD

Worked on the construction of a relational database system and on solid geometry editing. Also learned how to use the multi-device graphics editor.

Walbert, David
Mentor: Mr. Bruce Burns
Solanco High School
Lancaster, PA

Learned FORTRAN and designed financial management programs on Hewlett-Packard 9845c computer. Did plots of stress on hollow cylindrical beams with fixed supports and mass and area moment of inertia at points on central axis of projectiles with user defined dimensions.

Weaver, Michael P.
Mentor: Dr. Abdul Kiwan
John Carroll High School
Harford County, MD

Conducted static detonation tests to determine the fragment distribution from the explosion of a Stinger surface to air missile. Also participated in the development of a helicopter performance evaluation computer code including evaluating the speeds of maximum endurance and maximum range for a given helicopter at various mission weights.

Weidow, Paul L.
Mentor: Mr. Robert M. Cahoon
North Harford High School
Harford County, MD

Designed a program to compute the wages of the personnel here at LFD in FORTRAN for the development of the automation of payroll procedures. Also commented several FORTRAN programs, that is the editing of a program, line by line, by adding comment lines to explain what the program is doing.

Wilson, Mary C.
Mentor: Dr. Robert A. Fifer
North Harford High School
Harford County, MD

Analyzed the infrared spectra of nitrocellulose using a Fourier Transform infrared spectrometer to see if the percent nitration can be determined from the spectra. Also analyzed Russian and Swiss propellants using the same instrument.

Yerkes, William F.
Mentor: Mr. Howard Walter
C. Milton Wright High School
Harford County, MD

Worked on computer software dealing with the multichannel memo distribution facility and software that generated computer graphics. Programmed in C and worked in UNIX system environment. Learned how to use the MacPaint on the Apple MacIntosh.

BELVOIR RESEARCH AND DEVELOPMENT CENTER
AGENCY CONTACT
Joyce Burwell
STRBE-Z
Fort Belvoir, VA 22060-5606
(703) 664-4531

Allison, Laurie A.
Mentor: Mr. Thomas Bowen
North Stafford High School
Stafford County, VA

Worked with the Symphony integrated software package to create two tables to simplify analysis of data for usage with the oil quality assessment program, and in laboratory experiments.

Hanft, Vincent D.
Mentor: Ms. JoAnne Noble
T.C. Williams High School
Alexandria, VA

Used American Society for Testing and Materials Standards (ASTM Test Methods) to evaluate the physical properties of lubricating greases formulated to meet the government specification for a multi-purpose grease for use in the Department of Defense ground fleet and equipment.

Barber, Duane B.
Mentor: Mr. Mike Funkhouser
Lake Braddock Secondary School
Fairfax County, VA

Measured luminosity levels of each of seven tritium lamps in army magnetic compasses from various years to evaluate performance of tritium lamps, and assessed damaged sustained by compasses during field use.

Elam, Robert A.
Mentor: Mr. Thomas H. Bagwell
Bishop O'Connell High School
Arlington County, VA

Evaluated the effectiveness of a settling tank in the removal of suspended solids from water determined by dry massing the filterable residue from a known volume of water.

Getchell, Adam C.
Mentor: Ms. Robin-Lynn McClean
Lake Braddock Secondary School
Fairfax County, VA

Worked on providing a standard for comparing infrared camouflage materials by characterizing a background scene in the 550-25000 nanometer region, using the Nicolet D/X Fourier Transform Spectrometer, scanning the 2500-25000 nanometer waveband and the Blackman DK-2A ratio recording spectrophotometer, scanning the 500-2500 waveband.

Guelcher, Scott
Mentors: Ms. Elizabeth Radoski
Mr. Tom Bagwell
Major Steve Walter
Hayfield Secondary School
Fairfax County, VA

Conducted an experiment to determine the ability of magnets to prevent dissolved silica in feed water from fouling the RO element.

Hay, Reginald T.
Mentor: Mr. Phil Lundy
Dixon Hill High School
Prince George's County, MD

Aided in developing test design for vibration passive ultrasonic and ultrasonic motion senors. Participated in the execution of a test plan of a utilized system design kit which uses a microprocessor chip to solve various programming problems in assembly language. Combined use of the Intel emulator system and the SDK-85 to debug and execute program.

Hempstead, Scott A.
Mentors: Mr. Thomas Bagwell
Ms. Elizabeth Radoski
Lake Braddock Secondary School
Fairfax County, VA

Operated settling tank and took influent and effluent samples from the tank to evaluate its effectiveness in removing turbidity from water.

Holland, Joseph C.
Mentors: Mr. Thomas H. Bagwell
Ms. Elizabeth Radoski
Major Steven Walker
Bishop Ireton High School
Alexandria, VA

Conducted an experiment to evaluate the eight inch RO/UF during use to determine the effectiveness of magnets in controlling silica fouling.

Jillson, David G.
Mentor: Dr. Shing-Bong Chen
Gar-Field High School
Prince William County, VA

Conducted tests for using thermogravimetric analysis to determine the anti-oxidative characteristics of zinc dialkyldithiophosphate oil additives.

Jones, Thomas A.
Mentor: Mr. Gume Rodriguez
Eleanor Roosevelt High School
Prince George's County, MD

Developed testing procedures for conducting stress and crack growth tests on rubber involving more than one dimension, primarily for use in testing the durability of materials suitable for dynamic conditions as in tank track pads.

Learner, Paul M. Mentors: Ms. Dawn Escarsega Thomas Jefferson High School Fairfax County, VA	Aided in an extensive research and development project the materials fuels and lubricants laboratory undertook in a study to determine the most suitable rubber compound to serve in place of the current tank treads because of costly and time consuming considerations.
Lyon, Ali M. Mentors: Mr. Thomas H. Bagwell Ms. Elizabeth Radoski Major Steven Walker Gar-Field High School Prince William County, VA	Conducted an experiment to take influent and effluent samples from a settling tank in order to demonstrate its ability to remove suspended solids from water.
McCabe, Jo Ann L. Mentors: Mr. Henry Feuer Osbourn Park High School Prince William County, VA	Conducted research on the development of rubber tank track pad compounds to determine fatigue failure, permanent set, and extension ratios of rubber vulcanizates.
Milbank, Thomas L. Mentors: Mr. Charles A. Amazeen Langley High School Fairfax County, VA	Progress was made on an advanced tri-axial tactile sensor design which uses the piezoresistive effect to form data from the tension and compression of its strain gages resulting from an applied force. Also used conceptualized program software to translate resistance data into a three-dimensional vectorial representation of the force.
Millett, Roman L. Mentors: Mr. Joe Phillips Ms. Connie Harrison West Potomac High School Fairfax County, VA	Conducted research on proprietary information provided by over 100 civilian sector research organizations, in attempts to find and generate new and particularly interesting projects and concepts for the BRDEC research program.
Pham, Gerard Q. Mentors: Mr. Thomas H. Bagwell Ms. Elizabeth Radoski Major Steven Walker Mount Vernon High School Fairfax County, VA	Assisted in the development of quality analysis testing of six inch spiral-wound reverse osmosis elements manufactured by three independent companies for its use in the ROSPU.

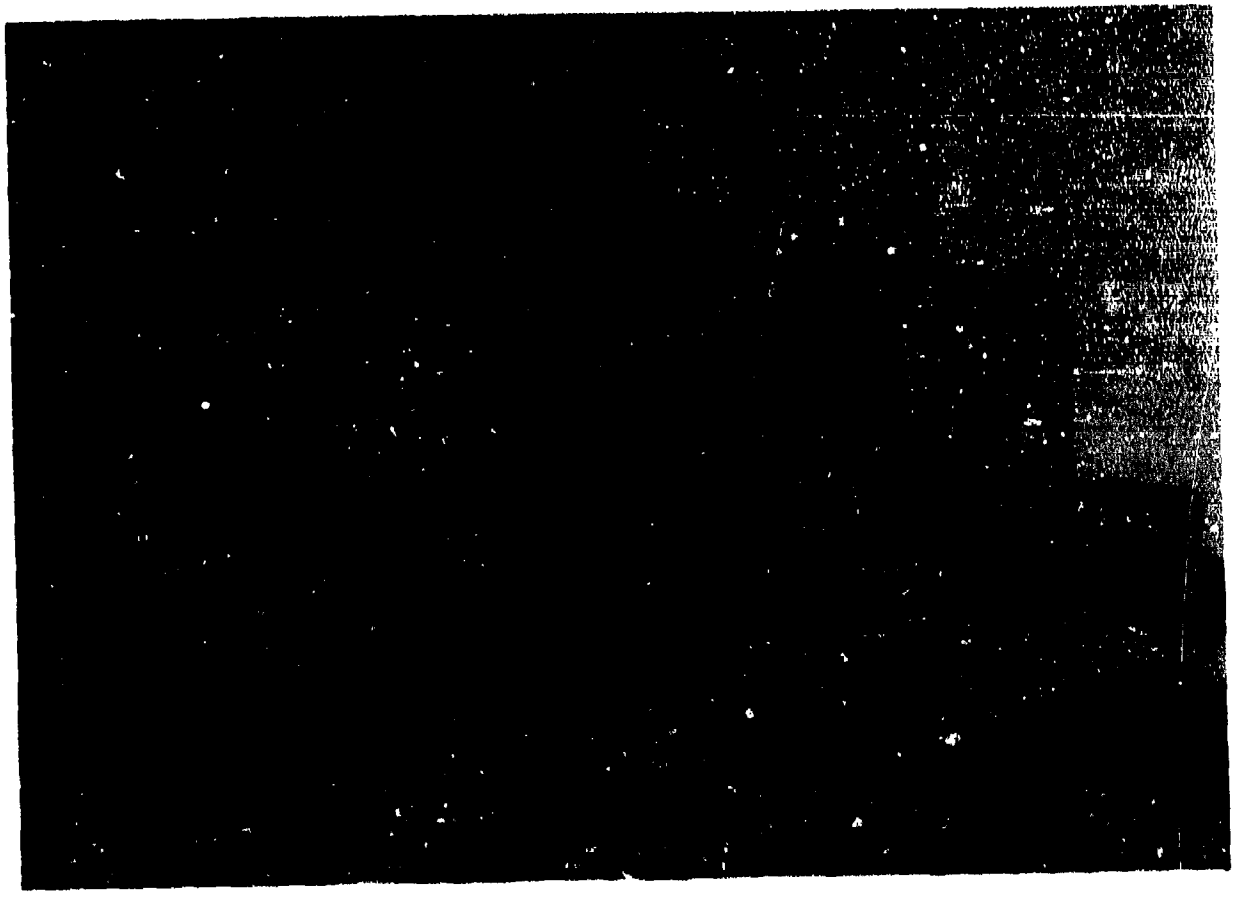
Pollard, Mary L. Mentor: Mr. D. Pat Butler Mount Vernon High School Fairfax County, VA	Conducted experiments to find the most versatile coated fabric that performs well and diffuses least at all temperatures. Conducted diffusion cup test and fuel-water interface tests employing coated materials and fuel to determine potential liquid loss of materials at different temperatures.
Schneider, Joseph M. Mentor: Mr. Donald W. Keehan Robinson Secondary School Fairfax County, VA	Produced and edited reference manuals for two major subsystems of the Arpanet/Milnet worldwide computer system.
Stelzer, Joan B. Mentor: Mr. Thomas G. Conway Mount Vernon High School Fairfax County, VA	Conducted a study on surface properties with respect to infrared and near infrared wavelengths to determine the emissivity of a surface using instrumentation both in the field and in the laboratory.
Stewart Joette L. Mentor: Mr. John Escarsega Gar-Field High School Prince William County, VA	Tested camouflage paints to ensure that they conform to military specification. Most of the testing was performed on Commercial batches although more extensive testing was completed on USA and QPL batches.
Talbot, Gary A. Mentors: Mr. David Poole Mr. Mark Locke Lake Braddock Secondary School Fairfax County, VA	Worked on computer design of Robotically-Assisted Self-deployable Cargo Handler (RASCH) end-effector for multiple machinery, specifically robot arms. Also, worked on a communication link between the Silicon Graphics 3030, IBM C69000 Industrial Computer and Cincinnati Milacron T3-726 robot arm utilizing PASCAL and C programming languages on both projects.

Vitton, Wayne A.
Mentor: Ms. Kathren Washburn
Robert E. Lee High School
Fairfax County, VA

Worked on various metallurgy projects such as: analyzing the 1-250 alloy for the light assault bridge and the tensile testing of the Army's new pipeline coupling using the Rockwell Hardness Tester, the Tensile Tester and grinding, and polishing equipment.

Wright, Kipp C.
Mentor: Mr. In-Sik Rhee
West Potomac High School
Fairfax County, VA

Studied basic computer language and used it with computer components and data acquisition/control unit. Also performed tests in accordance with the ASTM resolving questions over certain grease high temperature performance through the analysis of torque values.



CHEMICAL RESEARCH, DEVELOPMENT &
ENGINEERING CENTER
Agency Contact
Mr. Robert Gavlinski
Att: SMCCR-PPP, Building 330
Aberdeen Proving Ground, MD 21020
(301) 671-4351

Albert, Peter J.
Mentor: Mr. Steve Lawhorne
Edgewood High School
Harford County, MD

Tested the toxicity of fibers on terrestrial plants, prepared area soil samples for future analysis. Also collected and maintained various forms of aquatic life for use in toxicity studies.

Barker, Willard D., Jr.
Mentor: Mr. Steve Lawhorne
C. Milton Wright High School
Harford County, MD

Assisted in locating environmental hazards by determining the metal content and total organic carbon of soil and sump samples. Became proficient in the use of the organic carbon analyzer and the atomic absorption spectrophotometer.

Bennett, Dyer M.
Mentor: Mr. Don Benton
Perryville High School
Cecil County, MD

Prepared engineering change proposals for technical manuals, drawings of M28E equipment, and the transition of a protective entrance. Also prepared a literature search to find information on air locks, filter units and frequency converters.

Brown, Steven J.
Mentor: Mr. Thomas Witkowski
Rising Sun High School
Cecil County, MD

Inventoried XM16 spare parts, typed milestones and minutes from Weapon System Management Team meeting and collected and packaged XM18 spare parts sent to Dugway Proving Ground.

Bucci, Cynthia J.
Mentor: Mr. Clayton McKenney
John Carroll High School
Harford County, MD

Created a documented technical filing system updating changes made to engineering documents.

Franz, Jeffrey W.
Mentor: Mr. David Sickenberger
John Carroll High School
Harford County, MD

Assisted in the development of a detector simulator system using an Apple IIe computer designed to interface with a commercial paper system.

Gavlinski, Kristin B.
Mentor: Dr. Robert Armstrong
C. Milton Wright High School
Harford County, MD

Studied and evaluated the effect of prior escape experience of rats on subsequent conditioning to a nondiscriminated avoidance schedule.

Gilbert, Dawn M.
Mentor: Mr. Robert Gavlinski
C. Milton Wright High School
Harford County, MD

Assisted in the administration of students, inventoried facility drawings for a new building currently under construction, and conducted a literature search comparing techniques of supplies and equipment packaging.

Goeller, Christine C.
Mentor: Mr. Raymond Titus
C. Milton Wright High School
Harford County, MD

Calibrated the Dionex Ion Chromatograph; created and modified computer programs for analyzation of jet turbine data; did introductory testing of the Anderson Sampler System.

Hannan, Shawn M.
Mentor: Dr. Ed Stuebing
Fallston High School
Harford County, MD

Wrote a program and created files to simplify the capture of data necessary for reporting on forms using PASCAL and SHELL computer languages.

Hammond, Denise M.
Mentor: Dr. A. Peter Snyder
North Harford High School
Harford County, MD

Explored the detection of compounds by comparing data from an Electron Ionization (EI) Mass spectrometer and an Atmospheric Pressure Chemical Ionization (APCI) Mass spectrometer.

Hatfield, Craig E.
Mentor: Dr. T.C. Cheng
Fallston High School
Harford County, MD

Prepared and mapped bacterial plasmid DNA as a preliminary step leading to designing a cloning strategy.

Haywood, Deidre M. Mentor: Dr. Joseph Matta Aberdeen Senior High School Harford County, MD	Compared the effects on the resultant stain size of two types of diethylmalonate drops thickened with polymer additives under ideal and simulated field conditions.
Holbrook, Robyn M. Mentor: Mr. David Wesel Harford Christian School Harford County, MD	Developed theoretical models and experiments to determine the spreading rates of chemical surety materials on solid surfaces.
Holly, Lara K. Mentor: LTC Stanley Liebenberg C. Milton Wright High School Harford County, MD	Studied the bioavailability and systemic distribution of chromium from whetlerite dust in rats and the determination of chromium in organs, tissues, and fluids of exposed and controlled animals.
Houseknecht, Christina M. Mentor: Mr. David Wesel North Harford High School Harford County, MD	Developed theoretical models and experiments to determine the spreading rates of chemical surety materials on solid surfaces.
James Thomas E. Mentor: Mr. William Kinne Aberdeen High School Harford County, MD	Assisted in the development of a detector simulator system using an Apple IIe computer designed to interface with a commercial pager system.
Jun, Hae S. Mentor: Mr. Paul Grasso Perry Hall High School Baltimore County, MD	Formulated standard calibration curves for determining concentrations of chemicals; determined solution absorbencies; and used a linear regression program to perform statistical analysis.
Kaminski, Patricia Mentor: Mike Matthews C. Milton Wright High School Harford County, MD	Formed a software package that reduced vielastic data to an useful form and conducted a literature search to develop material safety and physical data sheets for chemicals.

Keyes, Theresa
Mentor: Dr. Amnon Birenzvige
C. Milton Wright High School
Harford County, MD

Compared the effects on the resultant stain size of two types of diethylmalonate drops thickened with polymer additives under ideal and simulated field conditions.

Killian, Paige C.
Mentor: Ms. Veronica Gross
C. Milton Wright High School
Harford County, MD

Utilized Primos and Intel computer systems to research revision locations for engineering change proposals; created instructional and continual input fields and organized engineering drafts for easy access in storage vault.

Knight, Susan L.
Mentor: Dr. Chen Hsu
North Harford High School
Harford County, MD

Used an FT-IR spectrometer to study the reaction efficiency of three-way oxidation catalysts for decomposing ammonia and monomethylamine gases in a flow system at various elevated temperatures.

Lugo, Kevin M.
Mentor: Mr. Anthony Saponaro
Aberdeen High School
Harford County, MD

Researched and observed vibration tables to test the ability of an object to resist vibrations. Also examined radiographs of M18 smoke grenades for physical defects.

McMaster, Thomas B.
Mentor: Mr. Thomas Marchand
Fallston High School
Harford County, MD

Worked with the refurbishing of a power driven, portable decontaminating apparatus for return to an Army Depot for reissue.

Munavalli, Billy
Mentor: Mr. Ted Novak
C. Milton Wright High School
Harford County, MD

Collected data to quantitatively study the fluorescence enhancement phenomenon produced by certain detector reagents when they are contacted by solutions of organic compounds.

Nelson, Todd M.
Mentor: Mr. William Ashman
Edgewood Senior High School
Harford County, MD

Utilized the VAX 11-730 to take x-ray crystal data of opiate compounds, incorporated data into the molecular modeling analysis and display to find the minimum energy conformation and the formal charge distribution of these compounds.

Nuesslein, Brian J. Mentor: Mr. Stanford Mumford John Carroll High School Harford County, MD	Studied the Intel computer system prior to organizing a database of viewgraphs using a spreadsheet, word processor, and a database program.
Ouellette, Danielle K. Mentor: Mr. Robert Jolliffe C. Milton Wright High School Harford County, MD	Calibrated the Dionex Ion Chromatograph; created and modified computer programs for analyzation of jet turbine data and did introductory testing of the Anderson Sampler System.
Pare', Mark J. Mentor: Dr. Robert Armstrong Rising Sun High School Cecil County, MD	Studied and evaluated the effect of prior escape experience in rats on subsequent conditioning to a nondiscriminated avoidance schedule.
Parker, William R. Mentor: Mr. Tom Mitchell Bel Air High School Harford County, MD	Modified an existing program in the chemical library to catalog all chemicals used in the Physical Protection Directorate. Supplied data such as EPA code listings, disposal method, and the assigned use for each chemical.
Peters, Mary H. Mentor: Dr. William White Fallston High School Harford County, MD	Studied the preparation and mapping of bacterial plasmid DNA as potential enzymatic decontaminants.
Proaps, Craig S. Mentor: Dr. Ronald Weiss W. Lauderdale High School Lauderdale County, MD	Created an air-humidifying system to study the effects of different humidities and flowrates on C2 canisters.
Rees, Michael D. Mentor: Mr. Christopher Karwacki Fallston High School Harford County, MD	Participated in the evaluation of a prototype designed respirator for use in specific chemical environments intended to provide the soldier with protection devices.
Reich, Heidi E. Mentor: Dr. Joseph DeFrank C. Milton Wright High School Harford County, MD	Worked with thermophilic and halophilic bacteria which were tested for enzymatic activity to determine a safe way to break down hazardous chemicals.

Richeson, Amy H. Mentor: Dr. Randall Wentsel Bel Air High School Harford County, MD	Conducted studies on earthworms and aquatic fate including stream analysis soil and plant digestions and serial extractions. Maintained soil columns and a midget fly colony.
Robbins, Debbie S. Mentor: Mr. Tim Schmidt Lake Brantley High School Seminole County, FL	Designed a computer program using the VAX 11/780, the Unix editor and PASCAL to act as a calculator to accept any mathematical expression using numbers or variables.
Robinson, Todd L. Mentor: Mr. William Fritch Joppatowne High School Harford County, MD	Assisted in the preparation of a respiratory testing program designed to provide the engineers with valuable information about various mask systems and the benefits each may provide the field soldier.
Rodgers, Kimberly D. Mentor: Dr. James Valdes Fallston High School Harford County, MD	Isolated TORPEDO NOBILIANA lipid microsacs and tested various chemical compounds on receptors from this tissue.
Root, Stephen T. Mentor: Mr. Edwin Gier Perry Hall High School Baltimore County, MD	Converted a DBase II programs to DBase III; wrote a program in UNIX that would manage a database; and designed a spreadsheet in Lotus 1-2-3 to calculate the budget of the division.
Samples, Sandra K. Mentor: Ms. Veronica Gross Joppatowne Senior High School Harford County, MD	Utilized the Primos and Intel computer systems in the search and location of notices of revision for engineering change proposals; created instructional and continual input files and organized engineering drafts in a storage vault.
Saponaro, Stephen K. Mentor: Mr. Curtis Bauer Perryville High School Cecil County, MD	Used the Computer Aided Design (CAD) system to revise and generate new drawings and charts, plotting those drawings and operating the blue line print machine.

Scavnicky, Michael J.
Mentor: Dr. Ronald Weiss
Joppatowne Senior High School
Harford County, MD

Created an air-humidifying system to study the effects of different humidities and flow rates on L2 canisters.

Scheurer, John P.
Mentor: Mr. William Krayhill
Aberdeen High School
Harford County, MD

Worked with lectins and nucleic acids in an attempt to find a lectin that is a receptor using DNA and RNA as a ribose source. Researched past work to determine which lectins were most likely to bind ribose and created tests to determine the binding characteristics of those lectins.

Seiter, Jane L.
Mentor: Mr. Steve Lawhorne
Rising Sun High School
Cecil County, MD

Tested the toxicity of fibers on terrestrial plants; prepared area soil samples for future analysis. Also collected and maintained various forms of aquatic life for use in toxicity studies.

Sindt, Kathleen A.
Mentor: Dr. Paul Fedele
Fallston High School
Harford County, MD

Developed a passive technique for collecting samples from the diffusion of methyl salicylate vapor through clothing. Also, collected and compiled data for a related project involving the diffusing of methyl salicylate through cloth.

Sisk, Janet L.
Mentor: Dr. Ed Stuebing
C. Milton Wright High School
Harford County, MD

Used XED forms package to create disposition and travel forms on the 382 computer.

Stephenson, Danielle S.
Mentor: Ms. Veronica Gross
North Harford High School
Harford County, MD

Utilized the Primos and Intel computer systems in the research and location of notice of revision for engineering change proposals; created instructional and continual input files and organized engineering drafts in a storage vault.

DAVID TAYLOR NAVAL SHIP RESEARCH &
DEVELOPMENT CENTER
Ms. Jill Priest
Civilian Personnel, Code 703.5
Bethesda, MD 20084

Ackerman, Lorrie F.
Mentor: Dr. Lawrence J. Maga
Montgomery Blair High School
Montgomery County, MD

Calibrated a reverberant glass wall. Used a water filled tank and determined the room constant based on the decay time of white noise.

Alexander, Richard
Mentor: John G. Hoyt, III
Hayfield Secondary School
Fairfax County, VA

Updated old sea state charts to include revisions made in 1980. Also tested one-third scale model of the high speed amphibian craft being developed for the Marine Corps.

Anderson, Eric W.
Mentor: John Deily
Thomas S. Wooton High School
Montgomery County, MD

Conducted a two-dimensional wind tunnel test on a Wortmann 18% thick airfoil and airfoil surface. Wake rake pressure data were recorded and used to produce airfoil pressure distributions and wake rake total distributions.

Baker, Steven M.
Mentor: Mr. George F. Wilhelmi
Chesapeake High School
Anne Arundel County, MD

Tested and evaluated a glass-reinforced plastic (GRP) vinylester ball valve. Also tested the valve stems to determine maximum torque at failure.

Herman, Morris S.
Mentor: Mr. Tom Waters
Winston Churchill High School
Montgomery County, MD

Determined effective aspect ratio of small waterplane area twin hull (SWATH) ship propeller fairings, force coefficients for a SWATH ship with a small, a large, and no fairing; the effect of the fairings on maneuverability; and the tactical turning radius of the ship with and without the fairings.

Cary, Michael H.
Mentors: Mr. Louis Aprigliano
Ms. Catherine Wong
Annapolis Senior High School
Anne Arundel County, MD

Conducted metallic damping measurement feasibility study to determine if techniques now in use are accurate by comparing results from different studies on similar materials.

Comenetz, Joshua
Mentors: Mr. Paul Holsberg
Dr. William E. Lukens
Annapolis Senior High School
Anne Arundel County, MD

Analyzed the effect of varying alloy content on the properties of RS/PM aluminum by computer testing of data generated to develop weldable rapid solidification/powder metallurgy (RS/PM) alloys.

Crouchley, Kelly
Mentors: Mr. Louis Aprigliano
Chesapeake Senior High School
Anne Arundel County, MD

Prepared welds for metallurgical examination to test for conformance to serviceability including microprobe analysis and microhardness tests.

Davis, Eric H.
Mentors: Mr. Robert Stevens
McLean High School
Fairfax County, MD

Wrote a manual for Symphony users. Developed a computer program in BASIC that will produce overheads. Made reports on the areas and volumes of two ships.

Demske, Susan
Mentors: Mr. Ed Hackett
Mr. Tom Montemarano
Glen Burnie Senior High School
Anne Arundel County, MD

Tested performance of two high strength RSP aluminum alloys of different chemical compositions. Investigated two separate crack plane orientations to identify the alloy exhibiting superior ductile fracture toughness.

Hardy, Douglas A.
Mentors: Mr. Peter C. Brenton
Magruder High School
Montgomery County, MD

Measured the strain in a vibrating aluminum bar by measuring changes in voltage in order to become familiar with the calculation for future use.

Harris, Julie A.
Mentors: Mr. William H. Hay
Winston Churchill High School
Montgomery County, MD

Analyzed and sorted data to determine the structural responses of the FFG-7 from a scaled structural rigid vinyl model. Also evaluated methods for reducing primary stresses in midship area of deckhouse.

Hucker, Michael M.
Mentor: Mr. Archie J. Wiggs
Thomas S. Wootton High School
Montgomery County, MD

Wrote FORTRAN-77 programs for computer networks; used a color calcgraphic display system, and worked with the finite element program NASTRAN and NASTRK, in the process of designing a test for a submarine propeller.

McClure, Scott C.
Mentor: Mr. Gene Camponeschi
Old Mill Senior High School
Anne Arundel County, MD

Wrote a BASIC program to perform computation on printed and stored data to test for bonding and strength in three-point bending and a 72 hour water boil.

Norman, Kathleen A.
Mentors: Mr. Mark T. Kirk
Mr. Tom Montemarano
Eleanor Roosevelt High School
Prince George's County, MD

Evaluated user's experience on the influence of the number of data points and of the magnitude of scatter in Weibull analysis, and how to use Weibull analysis on the LOTUS worksheet.

Park, Oggi
Mentor: Mr. Curtis Ash
Richard Montgomery High School
Montgomery County, MD

Entered data for the port characteristics report database and acquired programming experience with PASCAL and FORTRAN.

Plumpe, John G.
Mentor: Mr. Michael S. Byerly
Lake Braddock Secondary School
Fairfax County, VA

Mastered and operated REFLEX, a computer database program. Utilized the database to compile a 1986 fiscal year budget analysis report.

Rosenblatt, Barbara A.
Mentor: Thomas Hughes
Annapolis Senior High School
Anne Arundel County, MD

Used computer programming techniques to select quiet piping components to reduce the noise level on the latest surface ships and submarines.

Sherbrooke, Evan C.
Mentor: Mr. Kevin M. Lynaugh
Walt Whitman High School
Montgomery County, MD

Designed two original computer programs written in VAX FORTRAN-77 with extensive documentation to compute the basic characteristics of NACA four-digit wing sections.

Smalley, Paul M.
Mentor: Mr. John Joynes
Glen Burnie High School
Anne Arundel County, MD

Monitored the voltage across a power line in order to construct an interface device to attenuate the signal down with minimal phase shift and distortion and to isolate the meter from its source with isolation transformers.

Tse, Aileen A.
Mentor: Mr. Richard Messalle
Gaithersburg High School
Montgomery County, MD

Studied the useful method of dimensional analysis on how the behavior of large systems can be predicted on ships from a study of a small-scale model.

Zaroff, Cara D.
Mentor: Mr. Curtis Ash
Winston Churchill High School
Montgomery County, MD

Collected and analyzed data regarding United States seaports. Designed software database for storage and constructed mathematics-related programs in FORTHAN-77.

ENGINEERING TOPOGRAPHIC LABORATORY

AGENCY CONTACT
Mr. George Simco
(ETL-PR-RMI)
Ft. Belvoir, VA 22060
(703) 664-4812

Aitken-Cade, Charlene J. Mentor: Mr. Paul Krause Lake Braddock Secondary School Fairfax County, VA	Revised environmental effects programs for transfer to the VAX/VMS PASCAL system.
Allen, Christopher J. Mentor: Mr. Paul Krause West Springfield High School Fairfax County, VA	Programmed in PASCAL and MT+ to transfer environmental effects programs to the VAX/VM system. Used the MICROFIX computer.
Fisler, Jim Mentor: Dr. Pi-Fuay Chen West Springfield High School Fairfax County, VA	Developed computer programs to extract and automatically label key features of terrain radar images, which presently must be tediously interpreted by trained intelligence personnel.
Graham, Jonathan M. Mentor: Mr. Paul Krause Magruder High School Montgomery County, MD	Programmed in MT+ and PASCAL to transfer programs dealing with fixed-wing aircraft from an HP-86 computer to the MICROFIX for use by soldiers in the field.
Lewis, Derrick R. Mentor: Dr. Eugene A. Margerum Gonzaga College High School Washington, DC	Learned LISP programming language and used two types of computers and computer networks.
Stoops, Melanie Mentor: Mr. Paul Krause Gar-Field Senior High School Prince William County, VA	Translated BEES programs from Hewlett Packard-86 PASCAL to MTPLUS PASCAL for use in the field on the MICROFIX computer.
Voylaziakis, Krisan Mentor: Dr. Pi-Fuay Chen Thomas Jefferson High School for Science and Technology Fairfax County, VA	Created functions in a FORTRAN program to analyze and enhance radar images using a mini computer and a visual monitor. Programmed in LISP on a VAX 11-780 mini computer.

FORT DETRICK
AGENCY CONTACT
Mr. Joseph Hise
Civilian Personnel Office
Frederick, MD 21701
(301) 663-2314

Dobyns, Kathryn A.
Mentor: Dr. Judith G. Pace
Frederick High School
Frederick County, MD

Studied freshwater macroinvertebrates to determine the best method of feeding organisms.

Freed, Joann K.
Mentor: Mr. A.H. Rosen Crance
Frederick High School
Frederick County, MD

Collected numerous precipitates, from surface and ground water samples from immediate surrounding areas to analyze for alkalinity, hardness, anions and cations.

Hoke II, Steven H.
Mentor: Dr. W.H. Vander Schalie
Walkersville High School
Frederick County, MD

Continued research involving the development and validation of new methods for evaluating toxicity of materials to aquatic organisms.

Gregg, Paula M.
Mentor: Dr. Edward V. Hauer
Frederick High School
Frederick County, MD

Modified a mathematical technique called simplex optimization which identifies a set of operating conditions that produces maximum response time to a given system.

Kriegler, Michael G.
Mentor: LTC Bosetti
Governor T. Johnson High School
Frederick County, MD

Assisted in the completion of research related to understanding and documenting products formed through the photolysis of chlorine.

Lidl, Kurt J.
Mentor: Dr Michael J. Perich
Middletown High School
Frederick County, MD

Conducted entomological research on raising mosquitoes using the scanning electron microscope analysis techniques.

Pasquerette, Christopher M.
Mentor: LTC Bosetti
Brunswick High School
Frederick County, MD

Assisted in the completion of research related to understanding and documenting products formed through the photolysis of chlorine.

Ward, Denham R.
Mentors: Dr. Steven H. Hoke
Governor T. Johnson High School
Frederick County, MD

Continued research conducted on environmental monitoring of Monocacy River Basin water. Water samples were analyzed in laboratory for pollutants and contaminants; data obtained, stored and analyzed through a database management system.

HARRY DIAMOND LABORATORY
AGENCY CONTACT
Mr. Jeffrey Nelson
DHDL-CP-RP
2800 Powder Mill Road
Adelphi, MD 20783
(301) 394-2816

Allmon, William R.
Mentor: Mr. David Lawrence
Oakland Mills High School
Howard County, MD

Assisted in the upgrading of ram air driven alternators as fuze power supplies. Also, designed test fixtures to test amplifiers for fuzes and helped test foot and hand crank generators.

Claffy, Kimberly C.
Mentor: Mr. David M. Hull
John F. Kennedy High School
Montgomery County, MD

Continued in the development of computer software to stimulate the static electric field around the MIG-21, MIG-23, and the Tu-22M in order to test electrostatic proximity fuzes.

Dasenbrock, Derrick D.
Mentor: Mr. E. James Gaul
Eleanor Roosevelt High School
Prince George's County, MD

Assisted in the production of a plan of correlated information for shock tunnel testing of hardened tactical shelters. Constructed scale models of the vehicles to be tested and the blast simulators in order to check clearance and prevent problems.

Kelly, Gardner D.
Mentor: Mr. Joe Miletta
Gar-Field High School
Prince William County, VA

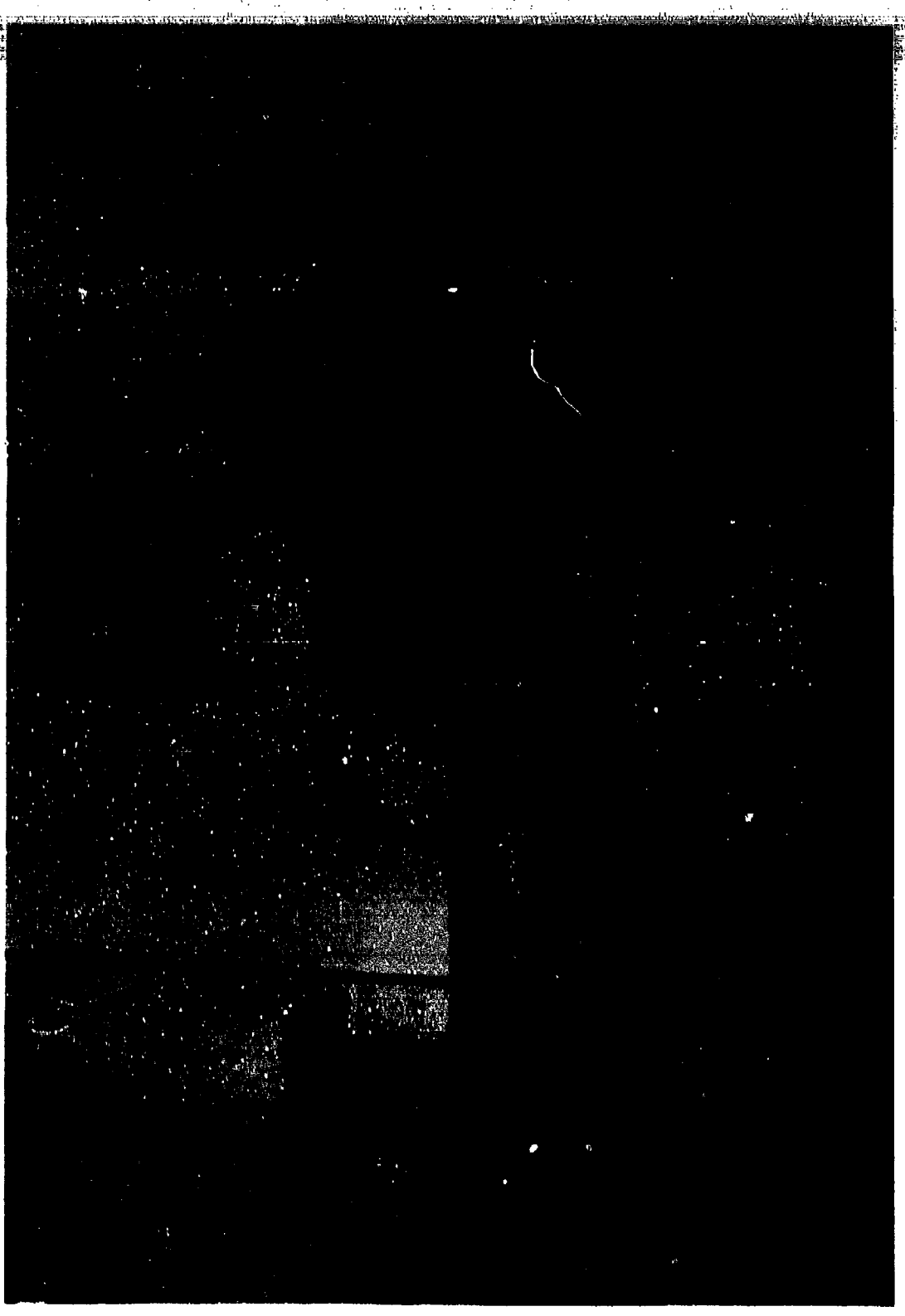
Designed a computer program in PASCAL with limited artificial vision that would convert a wave-form from a polaroid picture into digitized data which could be stored and analyzed by a computer.

Lee, Glen Y.
Mentor: Dr. Clyde A. Morrison
Eleanor Roosevelt High School
Prince George's County, MD

Acquired parameters that best fit the experimental energy levels of Fe(III) in rare earth aluminum garnets ($R_3Al_5O_{12}$) using the HOME program written by HDL personnel along with writing several programs for the VAX and IBM PC computers.

Lee, Jennifer L. Mentor: Dr. Mary Tobin Wheaton High School Montgomery County, MD	VAX modified FORTRAN integration subroutines to evaluate a Fresnel integral and get the intensity pattern of light diffracted by an aperture. Constructed an interferometer for use in testing how various optical devices placed in a system arm are affected by the light.
Lee, Ronald D. Mentor: Dr. Clyde A. Morrison Eleanor Roosevelt High School Prince George's County, MD	Worked on the development of energy levels and crystal field theories at the Radar Physics Branch. Wrote programs on the PC and the VAX computer systems along with doing library work and research.
McGlynn, Steve Mentor: Mr. Fred Turrill High Point High School Prince George's County, MD	Studied, tested, and analyzed sources of reserve power supplies before they are sent to the field to determine performance, and problems encountered if supply source failed.
Presgraves, Donna M. Mentor: Mr. Denis Whittaker Northwestern High School Prince George's County, MD	Assisted in setting up a major experiment in radiation effects testing including fabrication of a test screen for dosimetry and entering dosimetry data into a computer for analysis. Operated the computer system for data acquisition during tests and a vacuum processing controller.
Purchase, Ken G. Mentor: Dr. George J. Simonis Eleanor Roosevelt High School Prince George's County, MD	Assisted in the development of semiconductor optical waveguide and supporting measurement techniques in preparation for a semiconductor research project. Radiation is focused through a small sample of gallium arsenide to test the ability of such chips to act as waveguides.

Thurber, Dan E. Mentor: Mr. Fred Turrill Paint Branch High School Montgomery County, MD	Studied source of reserve power supplies to check, performance, and find problems encountered if supply source fails by testing and analyzing before they are sent to the field.
Wallman, Debra G. Mentor: Mr. Michael Bushell Eleanor Roosevelt High School Prince George's County, MD	Used the computer system's editor to modify a FORTRAN program which plotted graphs on a V-80 printer/plotter so it would include special waveform plotting options.
Weirhinski, Timothy M. Mentor: Mr. Youn M. Lee Bishop Ireton High School Fairfax County, VA	Used a Numerical Electromagnetic Code (NEC II) implemented in an IBM 370/168 computer to model a Medical Field Power Distribution System by analyzing the worst case electromagnetic pulse coupling to the power distribution system.
Wong, Ken T. Mentor: Dr. Clyde A. Morrison Northwestern High School Prince George's County, MD	Acquired parameters that best fit the experimental energy levels of Fe(III) in rare earth aluminum garnets ($R_3Al_5O_{12}$) using the HOME program written by HDL personnel along with writing several programs for the VAX and IBM PC computers.



NAVY MEDICAL RESEARCH INSTITUTE
AGENCY CONTACT
Dr. Michael Ackerman
Mail Stop 38
Bethesda, MD 20814
(301) 295-5899

Freeh, Anne E.
Mentor: Dr. John Maples
Thomas S. Wootton High School
Montgomery County, MD

Tested a monoclonal antibody for use on magnetic beads to determine a bead to cell ratio for depleting T-cells.

Hallenbeck, Michael G.
Mentor: Dr. Che Hung R. Lee
Bethesda-Chevy Chase High School
Montgomery County, MD

Assisted in the experimental study of the production of monoclonal antibodies against endotoxin in septic shock.

Hsu, Katherine K.
Mentor: Dr. William Nelson
Winston Churchill High School
Montgomery County, MD

Researched the techniques of DNA extraction, restriction endonuclease digestion of DNA, gel electrophoresis, southern blots, hybridization and x-ray photography to trace the evolution of IL1-3 gene from mouse to man.

Hsu, Stephanie C.
Mentor: Dr. Sara C. Gilman
Seneca Valley High School
Montgomery County, MD

Studied the effect of pressure on [^{3}H]serotonin release from synaptosomes isolated from the guinea pig striatum using a hyperbaric chamber.

Kim, Peter Y.
Mentor: Dr. Gregory Dasch
Gaithersburg High School
Montgomery County, MD

Conducted experiments on Rochalimaea: characterization of antigen with monoclonal antibodies in determining which induces an immune response.

Lee, Alex P.
Mentor: Dr. Sara C. Gilman
Eleanor Roosevelt High School
Prince George's County, MD

Studied the failure of pressure to affect [^{3}H] dopamine release from guinea pig striatal synaptosomes by using a hyperbaric chamber.

Lee, Jennifer K. Mentor: Dr. William Nelson Winston Churchill High School Montgomery County, MD	Extracted DNA from mouse, rat, green monkey, gibbon and human cells prepared through gel electrophoresis, southern blots, and hybridization techniques to test for the presence of interleukin-3 gene previously isolated in the mouse and rat genomes.
Mattamal, Maja D. Mentor: Dr. K.K. Kumaroo Winston Churchill High School Montgomery County, MD	Developed a method to isolate platelet basic protein by acid extraction differenial centrifugation to determine physical properties of platelet proteins from human platelets.
Mo, Denise F. Mentor: Dr. Andrew Dutra Thomas S. Wootton High School Montgomery County, MD	Used a canine model of spinal cord decompression to find a better method of treating the problem.
Preston, Sarah E. Mentor: Mr. Ron Ball National Cathedral School Washington, DC	Assembled alarm clock and multimeter, completed basic electronic repairs, received instructions in electronic, Boolean algebra, basic and test equipment.
Rickwald, Mary M. Mentor: Dr. Richard Lillo West Springfield High School Fairfax County, MD	Worked with photoionization detector to detect potentially dangerous gases in a diving chamber.
Sastry, Chandan M. Mentor: Dr. K.K. Kumaroo Winston Churchill High School Montgomery County, MD	Isolated the campylobacter LPS by using proteinase K.
Vassanelli, Mark A. Mentor: Mr. Ron Ball Northern High School Calvert County, MD	Was instructed in Boolean Algebra in order to identify with computer IC chips; worked in conversion of numeric base systems; instructed in and worked with basic electonic knowledge and received instruction in universal BASIC.

NAVAL RESEARCH LABORATORY

AGENCY CONTACT
Mrs. Nancy Lowry
Code 1840
Washington, DC 20375
(202) 767-2956

Abdon, Heidi S.
Mentor: Mr. Jay Oberfield
Oxon Hill High School
Prince George's County, MD

Learned and applied computer operating skills to make the computer facility more efficient and more useful to the scientists and programmers. Worked with many computer databases, and systems.

Batra, Anuj
Mentor: Dr. Papaconstantopoulos
Robinson Secondary School
Fairfax County, VA

Converted FORTRAN 77 program procedures to a VAX to calculate phase shifts in scattering theory presented in both charts and graphs in the periodic table.

Berry, Michael W.
Mentor: Dr. Kandiah Shivanandan
T.C. Williams High School
Alexandria, VA

Tested black body calibration for two long duration experimental facility (LDEF) infrared detectors to determine the effectiveness in the 1 to 5 micrometer wavelength range.

Blackmon, Louis L.
Mentor: Dr. Robert Handler
Oxon Hill High School
Prince George's County, MD

Wrote scientific programs dedicated to helping scientists collect and analyze data concerning turbulent flow in a channel using terminals linked to a VAX computer.

Bulstein, Heidi
Mentor: Mr. Dennis Toskin
Oakton High School
Fairfax County, VA

Gained experience in mechanical engineer's work procedures using the CADD system to work on model parts and actively participated in the different phases of a design project including the preliminary, detailed and revised design.

Brady, Christopher R.
Mentor: Dr. Iver Anderson
Oxon Hill High School
Prince George's County, MD

Conducted experiments on the impregnation of Inconel 625 with tungsten carbide using the laser-melt particle-injection method to improve wear resistance, and make material suitable for use in submarine shaft seals.

Braun, Joseph L.
Mentor: Dr. Thomas Kennedy
Oxon Hill High School
Prince George's County, MD

Studied techniques to optically detect magnetic resonance in semiconductor crystals to gain information about their defects. Designed BASIC software for use as an interface to control a superconducting magnet to acquire and process data.

Brennan, Jard J.
Mentors: Dr. Graham Cheek
Dr. Debra Rolison
T.C. Williams High School
Alexandria, VA

Examined reactions in nonpolar solvents utilizing microelectrodes to define some of the limits and to study their advantage over macroelectrodes.

Brown, Kimberly E.
Mentor: Dr. C.F. Gaumond
Oxon Hill High School
Prince George's County, MD

Used FORTRAN programs to study the approximate scattered sound field created when an acoustical plane wave is reflected off a rigid prolate ellipsoid.

Canuty My D.
Mentor: Dr. Larry Paxton
Oxon Hill High School
Prince George's County, MD

Revised many programs in several computer programming languages and acquired experience in the operations of the graphic plotters, and colorware equipment.

Chern, Laurie
Mentor: Dr. Iver E. Anderson
W.T. Woodson High School
Fairfax County, VA

Studied the use, procedures and applications of powder metallurgy in the ever changing needs of commercial industry ranging from medicine to nuclear engineering.

Clark, Leslie S.
Mentor: Dr. Robert P. Ingle
Annandale High School
Fairfax County, VA

Developed computer models of crack-tip stress and strain analysis as a more efficient way to understand the complicated properties associated with crack propagation.

Cohen, David N.
Mentor: Dr. Steven H. Gold
Woodrow Wilson High School
Washington, DC

Built an improved gyrotron which will emit three microwave beams instead of one for better concentration of energy transformation into coherent electromagnetic radiation. Used computers and a miniature model of a magnet configuration to measure magnetic field and confirm the data.

Constantine, Sophia L.
Mentor: Dr. John Cooper
James W. Robinson High School
Fairfax County, VA

Determined sulfate, nitrate, phosphate, chloride and fluoride in water samples using Ion chromatography. Anions detected in ship's boiler water samples can be used to calculate when boiler water has to be altered to maintain efficiency of operation without precipitation or corrosion.

Cooper, Terri E.
Mentor: Dr. Ronald Sheinson
Charles Smith Jewish Day School
Montgomery County, MD

Studied air purification and the factors affecting the destruction and removal of air pollutant gases. Methane is flowed into a high-voltage discharge cavity where decomposition products are analyzed in a gas chromatograph and quantified.

Copson, Jason A.
Mentor: Dr. Christie Marrian
Annandale High School
Fairfax County, VA

Modified a BASIC program which tested all channels of a computer port serving as an analog-to-digital converter. The computer could control or monitor non-computerized devices or equipment with output/input voltages higher than that which the computer uses.

Curry, Irving
Mentors: Dr. George Marmorino
Dr. Richard Mied
Crossland High School
Prince George's County, MD

Prepared scientific unit tapes to execute and compile programs that would plot temperature contours of the ocean needed to help the Ocean Dynamics Branch get a better picture of salt fingering from the data collected from C-SALT.

Das, Bevan N.
Mentor: Dr. James H. Adams
Eleanor Roosevelt High School
Prince George's County, MD

Modified interactive graphics programs designed to extend and enhance the ability to allow more than one curve to be plotted on the same graph. In addition to increased efficiency, the commands were shortened and interfaced with a library of histogram generating routines.

Davis, Michael A.
Mentor: Dr. U. Strom
West Potomac High School
Fairfax County, VA

Studied the dependence of near infrared photoluminescent intensity on incident visible light wavelengths to determine if any alterations in the PL excitation spectrum resulted from the lower temperature.

Dempsey, Brain D.
Mentor: Dr. Chandra Pande
Oxon Hill High School
Prince George's County, MD

Prepared samples of titanium alloys, recorded cross sectional images on film, digitized pictures, and generated graphs from manipulated data for a research paper to determine if the factual dimension of an alloy could be a key to the alloy's physical properties.

Diehl, William J.
Mentor: Mr. William D. Morris
Eleanor Roosevelt High School
Prince George's County, MD

Designed a subroutine which will allow real-time discrimination of patch activity when data, in the form of temperatures present at each of the sectors in the system, are input and plotted to present the data in a useful form for a PATCHEX experiment.

Dixon, Jonathan W.
Mentor: Mr. Robert Neidert
Eleanor Roosevelt High School
Prince George's County, MD

Ran a Monte Carlo simulation of a III-V (InP or GAAs) diode, varying parameters such as length, DC voltage across the diode, AC voltage and frequency, type of circuit and doping level of the diode. Graphs were made with voltage, current, and average velocity as variable, in an attempt to maximize the performance of the diodes.

Drew, Gregory D.
Mentor: Dr. Papaconstantopoulos
Robinson Secondary School
Fairfax County, VA

Converted FORTRAN 77 program procedures on a VAX to calculate phase shifts in scattering theory presented in both charts and graphs in the periodic tables.

Dutta, Subrata K.
Mentor: Dr. Achintya Ganguly
Eleanor Roosevelt High School
Prince George's County, MD

Designed an electron gun, by computer simulation, that would produce a high quality electron beam with 1.2A current operating at an anode potential of 33000v by testing and computing electron trajectories for various anodes.

Francis, Dean T.
Mentor: Mr. David S. Woodson
Saint Alban's Schools for Boys
Washington, DC

Used a network analyzer to conduct tests on various microwave devices to determine their insertion and reflection losses between 500MHz and 18 GHz to obtain suitable frequency ranges for use on pod-mounted radar simulators to evaluate ship's countermeasure tactics.

Fried, Dale H.
Mentor: Dr. Henry Hamburger
Central Valley High School
Spokane County, WA

Researched the development of an authoring environment for a modal learning system by learning Franz Lisp, a language used for the early developmental phase, and learned to operate the UNIX operating system and resident text editor for the VAX 11/780.

Furill, Karen E.
Mentor: Dr. David E. Tevault
Oxon Hill High School
Prince George's County, MD

Investigated new means of measuring low concentrations of environmental contamination through non-destructive techniques using Raman spectroscopy.

Glascoe III, William O.
Mentor: Dr. George Curruthers
Crossland High School
Prince George's County, MD

Investigated ways to maximize detection efficiency and maintain high photocathode quantum efficiency in likely storage environments. Investigated filter materials for an experiment concerned with ionosphere remote sensing and participated in the testing and calibration of laboratory standard detectors.

Hammond, Matthew C.
Mentor: Dr. Arthur K. Jordan
Lake Braddock Secondary School
Fairfax County, VA

Wrote programs to solve direct and inverse problems of sinusoidal ray paths in optical fibers. These paths were graphically displayed and compared.

Harter, Alexa W.
Mentor: Dr. James Adams
Sidwell Friends School
Washington, DC

Examined the plastic detector sheets used to measure the damage cosmic rays inflict on satellites. Tests were made to determine the detecting sensitivity of Rodyne P, or lexan. The sheets were UV enhanced, etched in NaOH solution, then examined to determine the affect on detecting sensitivity.

Hazlq, Mustafa M.
Mentor: Dr. Bruce Gaber
Oxon Hill High School
Prince George's County, MD

Wrote programs to construct a three-dimensional picture of a lecithin molecule. The actual calculation of the coordinates of the molecule and the creation of the picture was done on the VAX. The Dicomed was used to make pictures of the molecule and transfer the image to photographic film.

Heiss, Aaron A.
Mentor: Dr. Hung-Tai Wang
Brookfield High School
Fairfield County, CT

Tested the reaction between hydrogen and fluoride ions in a plasma flow reactor by connecting the reactor to a photometer and an X-Y platter, so the reaction emission spectra were obtained and analyzed.

Ho, Kathleen K.
Mentor: Dr. R. Panayappan
West Springfield High School
Fairfax County, VA

Developed an efficient method of determining the concentration of chloride and sulfate in boiler water samples using the DC Argon Plasma Atomic Emission Spectrometer.

Huckaby, Ernest D.
Mentor: Dr. John W. Gibson
Dixon Hill High School
Prince George's County, MD

Aided in the testing of a thermionic electron emission in an ultra-high vacuum system. Learned many concepts about electronics including writing and debugging in programming languages as well as actual computer operations.

Jones, Michele A.
Mentor: Dr. R. Little
Browne Junior High School
Washington, DC

Assisted in the preparation of a drag reduction research project of slurries made from designated poly ethylene oxide particles.

Jordan, Thomas B.
Mentor: Dr. C. Krowne
Mount Vernon High School
Fairfax County, VA

Investigated the characteristics of slow wave, voltage variable, monolithic ion implanted microwave phase shifters. Developed a computer code to determine phase shift and loss from de-embedded service S-parameters and wrote a program to find the freeze-out of carriers in the device at cryogenic temperature.

Klunder, Jennifer D.
Mentor: Dr. Richard Ford
T.C. Williams High School
Alexandria, VA

Researched and built a circuit to be used in conjunction with a LeCroy digital data acquisition system to increase the facility's PAWN data acquiring techniques.

Buckler, Thomas H.
Mentor: Mr. Mark Rubinstein
T.C. Williams High School
Alexandria, VA

Developed rare earth alloys using an inert arc-melter, and proceeded to encapsulate the systems in quartz tubes for the homogenous product of annealment.

Kolby, Elizabeth I.
Mentor: Dr. Merle E. Umstead
Oxon Hill High School
Prince George's County, MD

Conducted an experiment on the kinetics of the reaction of CH3* + NO2 in order to gain a thorough understanding of the reaction.

Labatte, Zachary A.
Mentor: Mr. Dorsey L. Thacker
T.C. Williams High School
Alexandria, VA

Performed various tests on filter modules analyzing their outputs at various temperatures, power levels and frequencies to assure the quality and success of the millimeter-wave atmospheric sounder, a "first ever" space-based device to monitor the middle atmosphere.

Lowry, Jodi M.
Mentor: Mr. Cedric D. Beachem
Surrattsville High School
Prince George's County, MD

Assisted in developing procedures for observing failed specimens including techniques for annealing with high technical equipment before, during, and after specimen preparation. Observations were documented with photographs and written records.

Mah, Raymond Y.
Mentor: Dr. Ken Johnston
Oxon Hill High School
Prince George's County, MD

Processed data from the very long array through the astronomical image processing system computer programs to produce maps of merging galaxies for analysis of structure and flux intensities at wavelengths of two and six centimeters.

Martin, Calvin J.
Mentor: Mr. Eric W. Hendricks
Oxon Hill High School
Prince George's County, MD

Studied drag reduction created by the introduction of polymers into the flow field of water vehicles and the use of polyethylene oxide additives in water solvent to produce lower frictional drag coefficients.

Martof, Tanya E. Mentor: Dr. Stuart Wolf Oxon Hill High School Prince George's County, MD	Learned to measure, and pattern thin films and studied the superconductivity transition in thin film, especially the cermet NBN-BN.
McKibben, Bryan P. Mentor: Mr. Cedric D. Beachem Bishop McNamara High School Prince George's County, MD	Analyzed a failed shock strut piston using a scanning electron microscope, ISI-SX-30, and a Tractor TN2700 (which provides an x-ray spectrum of the specimen surface).
McMillan, Charmel Y. Mentor: Dr. David Webber Crossland High School Prince George's County, MD	Conducted tests to determine the tensile strength of an experimental fiber which was a mixture of two polymers (poly-phenylene diamine (KEVLAR, and poly-phthalocyanine) doped with iodine, to identify mechanical properties of phythalocyanine-loaded Kevlar fibers.
Messina, Felicia K. Mentor: Dr. Rein Silberberg LaReine High School Prince George's County, MD	Collected and prepared experimentally measured cross section data to be compared with the semi-empirical equations providing new information that will allow NRL scientists to evaluate and modify certain equations.
Miller, Ronald J. Mentor: Dr. Jeffrey Pond Oxon Hill High School Prince George's County, MD	Examined characteristics of systems with varying parameters, using a computer program to simulate a delay line. Two methods of delaying microwave signals are presently employed; surface acoustic waves, and kinetic inductance microwave delay lines.
Monsour, Christopher J. Mentor: Dr. Richard Magno Saint Anselm's Abbey School Washington, DC	Constructed a computer-controlled system in order to measure the current-voltage characteristics of experimental Au/AlGaAs Schottky diodes.

Mueller, Boris A. Mentor: Mr. Bernie Kaufman Dixon Hill High School Prince George's County, MD	Converted BASIC programs dealing with the orbit of satellites, from the Hewlett-Packard 9845B to the Hewlett-Packard Integral PC. These programs dealt with Keplerian elements, Kepler's equation, and perturbations.
Nguyen, Linh B. Mentor: Dr. Kurt W. Weiler W.T. Woodson High School Fairfax County, VA	Obtained a basic knowledge of stellar evolution by studying and then mapping two super-novae.
Pande, Vijay S. Mentor: Mr. Larry Paxton Langley High School Fairfax County, VA	Constructed a spherically symmetrical atmospheric simulation and also, produced metric code graphics on the branch's AED super-resolution bit map graphics unit for data analysis and planetary display.
Patridge, Stephanie L. Mentor: Dr. Paul F. Slebodnick Surrattsville High School Prince George's County, MD	Reduced commercially pure copper samples in size by cold working, and then treating at a temperature of 500°C for varying times. The specimens were prepared and etched for verification of grain boundaries.
Phan, Luong-Quyen T. Mentor: Dr. Allen R. Miller T.C. Williams High School Alexandria, VA	Learned how to use the VAX computer system as well as to write FORTRAN programs while using the Display Integrated Software System and Plotting Language (DISSPLA) package and to run batch jobs on the Cray computer.
Potter, Richard S. Mentor: Dr. Rudolph A. Krutar The Phillips Exeter Academy Rockingham, NH	Automated a program to create and print business cards that ran in 'Prolog using the UNIX operating system on the ISI computer.

Potts, James A.
Mentor: Dr. Arnold Shih
Oxon Hill High School
Prince George's County, MD

Wrote BASIC programs to control four synchronous stepping motors and run cathode emission tests with those motors. Learned the operation of high-vacuum chambers used in the lab, and the use of shop equipment.

Reading, Richard A.
Mentor: Mr. David S. Woodson
Oxon Hill High School
Prince George's County, MD

Tested various microwave devices for insertion and reflection loss between 500MHz and 18GHz to determine optimum frequency ranges for the use of the devices in an AN/ALQ-126 simulator and other activities.

Reaves, James L.
Mentor: Dr. Robert Ingel
Oxon Hill High School
Prince George's County, MD

Debugged a program used as a furnace simulator and revised a version of the simulator to control furnace temperature and take data measurements for experiments that require long periods of heating.

Reid, Katrina M.
Mentors: Mr. George Perez
Mr. Jay Oberfield
LaReine High School
Prince George's County, MD

Learned and applied computer operating skills to make the computer facility more efficient and more useful to the scientists and programmers. Worked with many computer databases, and systems.

Riddle, F. Thomas
Mentor: Dr. Fred W. Williams
Bishop McNamara High School
Prince George's County, MD

Generated computer graphics for Navy test beds a process by which images are read through a camera lens and displayed on a computer screen. These blueprints were done on an IBM-XT running ImagePro software.

Rinko, John D.
Mentor: Dr. E.D. Palik
Oxon Hill High School
Prince George's County, MD

Investigated the interface chemistry of heavily doped silicon in potassium hydroxide solution (aqueous) because of the need to micro-fabricate small silicon structures for both mechanical and electrical applications.

Rose, Robert J. Mentor: Dr. L. Lavedan Oxon Hill High School Prince George's County, MD	Used FORTRAN program skd (Satellite Pass Schedule) and Satread (Satellite Schedual Read to continue research to calculate statistical information on different sets of satellites.
Slamey, Mark F. Mentor: Dr. Henry Wang Lackey High School Charles County, MD	Converted FORTRAN programs to the Hewlett Packard 9000 to generate random sea waves, radiation and diffraction waves, and KELVIN waves (including elevation, x slope, and y slope).
Speight III, James T. Mentor: Mr. Alan Pezzulich Benjamin Banneker High School Washington, DC	Created a computer program that distinguishes between and identifies the various types of cruise missiles using Intels 8085 microprocessing unit, and ICE-85 emulator.
St. Clair, John W. Mentor: Dr. Richard K. Jerk Bishop McNamara High School Prince George's County, MD	Used three computer systems, a Hewlett-Packard 98258 desktop computer, the Johns Hopkins University Applied Physics Laboratory IBM 3033MP and the Naval Research Laboratory Space Science VAX 11/785 to help complete two major research reports involving computer graphics, data processing, and word processing.
Stewart, Holly D. Mentor: Dr. Debra Rolison Frederick Douglass High School Prince George's County, MD	Studied pH and atomic absorption measurements for Zeolite Y supported ultramicroelectrodes to determine the voltage-induced leaching of ions from Zeolite.
Suh, Alexia Y. Mentor: Dr. Doug Moon Oakton High School Fairfax County, VA	Studied the effects of Mg and Zn on laser beam welding to determine the extent of the conflicting factors on weld penetration.

Swanson, Wendy S.
Mentor: Dr. E.F. Skelton
Oxon Hill High School
Prince George's County, MD

Wrote a FORTRAN program to utilize a fast Fourier transfer (FFT) subroutine. This program plots both the initial data points and the FFT of the data.

Swarthbaugh Jr., Lewis M.
Mentor: Dr. Robert Pellenberg
Suitlandtsville High School
Prince George's County, MD

Examined the synthesis of various mixed polymerization of stannoxanesiloxane compounds in an effort to prepare new active additives for use as anti-foulant paints.

Thomas, George
Mentor: Mr. George S. Kang
Eleanor Roosevelt High School
Prince George's County, MD

Constructed a signal processing computer system which supported graphics as well as FORTRAN for an original approach to speech synthesis for high quality speech at low data rates.

Thorpe, Jack A.
Mentor: Dr Bruce Wald
Oxon Hill High School
Prince George's County, MD

Did a case study on RS-232C connections; understanding communications between computers and their peripherals.

Tyler, Lori A.
Mentor: Mr. Cedric Beachem
Ballou Senior High School
Washington, DC

Studied in detail the reasons rubber bonded pistons crack, and how we can prevent such cracking.

Walden, Ronald B.
Mentor: Mr. Jeffrey A. Mills
Suitlandtsville High School
Prince George's County, MD

Developed a tone generator for an underwater research vehicle capable of transmitting five refined amplified signals, which can be used for directional mobility.

Wash, Claude T.
Mentor: Ms. Kay Howell
T.C. Williams High School
Alexandria, VA

Learned VAX text processing utility.

Weaver, Anthony L.
Mentor: Mr. S.W. Gold
Ballou Senior High School
Washington, DC

Tested microwaves to determine the high voltage Ka band gyrotron to produce more powerful microwaves at much greater efficiencies.

Wehner, Erica A.
Mentor: Dr. Hung-Tai Wang
Oxon Hill High School
Prince George's County, MD

Studied the correlating factors of energy structure on the isoelectronic sequences of all the Group III elements.

West, Michael W.
Mentor: Dr. Alvin Owens
Oxon Hill High School
Prince George's County, MD

Created two complexity models for the IBM PC-XT and learned how to use the RCA Price S and Price H parametric cost models. Wrote accurate user friendly support programs to estimate the costs of actual projects.

White, LaMonica
Mentor: Dr. Leonard Wagner
Benjamin Banneker High School
Washington, DC

Processed data collected on tapes to give a pictorial view of the effect of the ionosphere on radio waves at various frequencies.

Williams, Katrina L.
Mentor: Dr. Denis Webb
Maurice J. McDonough High School
Charles County, MD

Used FORTRAN programs to study techniques for calculating surface acoustic wave velocity on a substrate overlayed with a thin layer and to analyze the properties.

Wills, Andrew F.
Mentor: Dr. Bruce Wald
Falls Church High School
Fairfax County, VA

Learned the UNIX(TM) operating system and file security using Permission, a program designed to protect computer files.

Woodard, Brian T.
Mentor: Dr. James E. Butler
Oxon Hill High School
Prince George's County, MD

Synthesized nitrosyl chloride using the reaction: $2NO + Cl_2 = 2NOCl$, using a diode laser, an etalom, and as a reference, the rotational spectrum of the v_8 mode of NOCl was taken.

Yang, David T.
Mentor: Dr. Paolo Lanzano
Oxon Hill High School
Prince George's County, MD

Studied properties of the parabolic time, flight, and range of projectiles on a variation of velocities.

Yen, Adeline H.
Mentor: Dr. Rudolph A. Kratur
West Potomac High School
Fairfax County, VA

Developed a program written in Prolog to coordinate, review, record annotations, and the questions of users for other users to see in addition to summarizing statistics.

NAVAL SURFACE WEAPONS CENTER
AGENCY CONTACT
Mr. Michael Antos
P60
Dahlgren, VA 22448-5000
(703) 663-8701

Addair, Penny L.
Mentor: Mr. Allen Estes
King George High School
King George County, VA

Wrote a software package which performs calculations involving RF energy, slope-intercepts, Ohms law, telemetry, and analog magnetic tape footage, as an aid during testing. Assembled single conductor co-axial cables and participated in EMV testing as an instrumentation equipment operator.

Berger, Karen L.
Mentor: Mr. Jimmy Cole
Stafford High School
Stafford County, VA

Created, edited and inputted files for programs or stored data on the VAX/VMS computer system.

Bill, Christopher J.
Mentor: Mr. Joseph R. Powell
James Monroe High School
Fredericksburg, VA

Translated BASIC programs that simulated fragmentation arenas; wrote and designed software to manage the purchase orders of Branch R-15; and designed data structures to be used in a turbo PASCAL database.

Bondermann, Mary Jo
Mentor: Mr. William R. Burrell
King George High School
King George County, VA

Created a collection of single ship and single threat test scenarios to be integrated into a test matrix designed to validate the simulation model FACTS (Fleet AAW Model for Comparison of Tactical Systems).

Bowling, Daniel W.
Mentor: Mr. Ted Saffoe
LaPlata High School
Charles County, MD

Developed an algorithm for processing single scans or raw radar data to enhance target detectability and evaluate data to distinctively define a target without interference.

Brown, Eric C.
Mentor: Mr. Thomas F. Zizzi
Rappahannock High School
Richmond County, VA

Produced data flow diagrams and evaluated and compared two systems on the basis of their user friendliness and applicability to real-world problems.

Brown, James C.
Mentor: Mr. William Lucado
King George High School
King George County, VA

Set up a parts and equipment database for inventory control; redesigned and built a radar absorption material framework to be used on the U.S.S. Kitt, Hawk, built several equipment storage centers, and tested cables on an antenna test set.

Clark, Thomas A.
Mentor: Mr. John Walton
James Monroe High School
Fredericksburg, VA

Due to personal difficulties unable to participate required time. Therefore, no paper submitted.

Fetters, Damon S.
Mentor: Mr. Michael D. Puig
Courtland High School
Spotsylvania County, VA

Generated graphs depicting financial status of vertical launching system program using Graphwriter software. Created data forms on the local area network for the storage and update of VLS records using the user-defined application package option of the office power system.

Frederick, Angela D.
Mentor: Mr. Michael D. Puig
King George High School
King George County, VA

Wrote BASIC computer programs to store information including labels and data points; made a high quality hard copy of graphs in color to allow viewing of the graph on a PC-XT or AT screen before printing.

Green, John L.
Mentor: Mr. Bob Paterno
King George High School
King George County, VA

Worked on an Apple IIe; used Lehmne-Schur and synthetic division algorithms to approximate the roots of a polynomial function; and learned 6502 assembly program language.

Laposta, Wendy A.
Mentor: Mr. Ken Thorsted
King George High School
King George County, VA

Produced a plot that illustrated the relationship of flexural strength to ambient temperature in various materials used in high speed air borne applications. Developed programs to list input parameters in an easily understood format, for a program which performs aero dynamic heating calculations.

Humphrey, Holly N.
Mentor: Mr. Francis E. Bray
Spotsylvania High School
Spotsylvania County, VA

Worked with a computer accessory which converts analog information to digital form. Wrote and modified FORTRAN programs to suit multiple and varied needs involving the A/D converter.

O'Brien, Patrick C.
Mentor: Mr. Dave Clawson
North Stafford High School
Stafford County, VA

Simplified the fleet air combat interactive tactical simulation by creating subroutines using the Zenith Z-100 PC series computer.

Orsulak, Kara
Mentor: Ms. Toney Benson
King George High School
King George County, VA

Used the Prime 250 computer system to dump files, initialize and shut down system and provoke help commands. Also calibrated lab equipment and became familiarize with the IBM LOTUS 1-2-3 software package.

Ramsey, Scott T.
Mentor: William A. Masi
King George High School
King George County, VA

Tested the SLQ-32 antenna by using controlled input of elevation angle, direction angle, frequency; and designed a way to record three-dimensional graphics format using the enter graphics program on a Hewlett Packard Vectra computer.

Rothman, Timothy P.
Mentor: Mr. Robert Kilpatrick
Colonial Beach High School
Westmoreland County, VA

Assisted in evaluating twelve light antitank weapons produced from eight companies in six different countries by working on schematics of the systems on the Apple MacIntosh 512K PC.

Seeber, Alyson K.
Mentor: Mr. David Lindberg
St. Mary's Ryken High School
Saint Mary's County, VA

Designed an electronic symbol template for use with the Pro-design II CAD System on the IBM PC-XT, AT.

Snead, Charlotte L.
Mentor: Mr. Chis Hontgas
King George High School
King George County, VA

Worked on the calibration of several of the instruments used in shipboard electromagnetic compactability improvement programs. Learned about the work involved in technical engineering and how to use analyzers, oscilloscopes and various signal generators.

Tarczak, Thomas M.
Mentor: Dr. Paula Perini
King George High School
King George County, VA

Performed a series of tests on a prototype of an antenna test set to help determine which test procedures yield the most accuracy. Developed two structures to support radar absorption materials for electromagnetic compatibility tests on the U.S.S. Kitty Hawk.

Turner, Steven C.
Mentor: Brian Sabourin
LaPlata High School
Charles County, MD

Tested and evaluated the PHALANX close-in weapon system.

Twitford, Andy K.
Mentor: Mr. Francis E. Bray
Spotsylvania High School
Spotsylvania County, VA

Worked with a computer accessory which converts analog information to digital form. Wrote and modified many programs to suit multiple and varied needs involving the A/D converter.

West, Eric S.
Mentor: Mr. Danny Haywood
James Monroe High School
Fredericksburg, VA

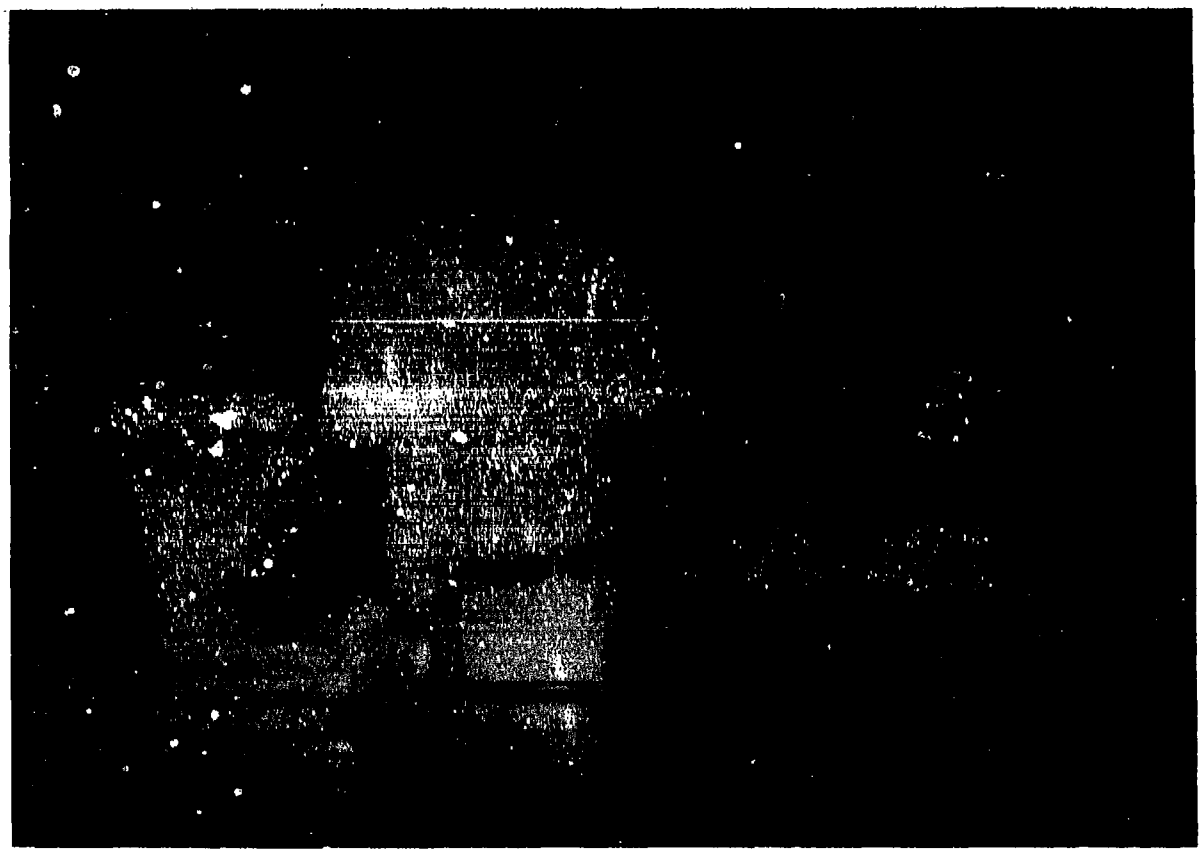
Assisted mechanical engineers in the installation of a 120 millimeter mortar into a light armored vehicle and in the modification and testing of the mortar and vehicle.

Williams, Karen L.
Mentor: Ms. Kay Shaffer
King George High School
King George County, VA

Tested and compared machines with standards to indicate a noise exposure level through examination of protective measure assurances for safety, to prevent permanent hearing loss.

Wolfson, Christopher
Mentor: Mr. Thomas DeRieux
Maurice J. McDonough High School
Charles County, MD

Developed an original artificial intelligence oriented language program, turbo prologue to relocate personnel based on any of attributes (general or specific).



NAVAL SURFACE WEAPONS CENTER
AGENCY CONTACT
Ms. Dorothy Seabolt
NSWC-P60-White Oak
New Hampshire Avenue
Silver Spring, MD 20910
(301) 394-2506

Bartoletti, Andrea
Mentor: Dr. Richard Harrison
Regina High School
Prince George's County, MD

tested energy using the NSUC guided wave tube absorbing acoustic material. Performed experiments to find the effects of different types of inclusions and to find a sample that absorbed high amounts of acoustic energy.

Chen, Mitchell C.
Mentors: Mr. Jerry Whelan
Mr. George Stimak
Centennial High School
Howard County, MD

Produced FORTRAN programs that received the location and magnitudes of dipoles and outputted the fields at specified location in graph form using the Interactive Graphics Library utility.

Civerolo, Kevin L.
Mentor: Mr. Phillip O. Hwang
Eleanor Roosevelt High School
Prince George's County, MD

Used an IBM-PC to do word processing documentation for programs, business letters, and memos. Used the AutoCAD program to draft a layout of a proposed computer facility.

Duran, Randall
Mentor: Mr. Lewis Vendetti
Albert Einstein High School
Montgomery County, MD

Automated the testing procedures for geophones, seismic sensors, using a PC that had a special interface card installed. Created a BASIC evaluative program that required the user to set up test equipment and to give the computer basic information about the test setup.

Edwards, Thomas G.
Mentor: Mr. Robert Otte
Springbrook High School
Montgomery County, MD

Wrote a generic assembler program in FORTRAN 77 language to run on a Hewlett Packard 1000 computer for system optimization.

Fields, Michael J.
Mentor: Dr. Kurt P. Schernhorst
Springbrook High School
Montgomery County, MD

Studied the acoustic properties of rubber materials by computer simulation; examined the effects of scattering and absorption on the propagation of waves and adjusted the structural and mechanical parameters to optimize the acoustic performance of sample materials.

Fisher, Eric B.
Mentor: Mr. Phillip Hwang
Hammond High School
Howard County, MD

Created a six-room floor plan using Computer Aided Design; inputted programs and modified FORTRAN programs for use with an IBM compiler.

Francis, Deepa A.
Mentor: Mr. Joseph Williams
Eleanor Roosevelt High School
Prince George's County, MD

Modified the time difference of arrival contour generation FORTRAN program's graphic output format with the objective of improving user comprehension.

Gay, William H.
Mentor: Mr. S.K. Petropoulos
Newport Preparatory School
Montgomery County, MD

Wrote a FORTRAN program which calculates polarized sea radiance from black body radiance at the sea temperature, sky radiance, and distribution of wave slopes using the reflectivities of sea water.

Hahn, Adam G.
Mentor: Mr. Robert Bost
Newport Preparatory School
Montgomery County, MD

Programmed a number of programs written in FORTRAN 77 to run on the VAX-11/780.

Hicks, Melanie R.
Mentor: Mr. Gilbert Lee
Holton-Arms High School
Montgomery County, MD

Conducted uniaxial tension tests on the polymer polychlorotrifluoroethylene. Performed data analysis on a micro computer and developed additional software for this analysis which included data tables and plots.

Hui, Eric C.
Mentor: Mr. James Duffy
John F. Kennedy High School
Montgomery County, MD

Continued summer 1985 research on various epoxy-amine combinations to determine and the kinetic reaction rate constants. A scanning calorimeter was used to detect the two exothermic peaks from the reactions of the primary and secondary amine hydrogens. The rate constants, K1 and K2, were calculated from the DSC results. The effect of an isomeric change in the amines was reported.

Joyce, James W.
Mentor: Mr. Jae K. Lee
Rockville High School
Montgomery County, MD

Created a flow tree for the SARVER software package to show the structure of calling sequences of approximately 60 subprograms to provide better traceability of subroutine.

Kang, John C.
Mentor: Ms. Marilyn Wun-Fogle
Paint Branch High School
Montgomery County, MD

Studied corrosion on amorphous wires by measuring the composition of $FE_{77}CrSi_{10}B_{13}$ and $Fe_{81}Co_{.5}Cr_2Si_9B_{13}$ for their fatigue limits in the bending strain apparatus.

Kasten, Michael S.
Mentor: Mr. Phillip Hwang
Seneca Valley High School
Montgomery County, MD

Assisted in the development of computer programs with multiple processors to allow simultaneous execution by another processor to permit a faster rate of execution.

Lewis, Daniel C.
Mentor: Mr. James F. Watson
Eleanor Roosevelt High School
Prince George's County, MD

Used FORTRAN, BASIC A, LOTUS 123, Ethernet Terminal Server on the IBM PC/XT to upload to VAX 11/785 mainframe computer to study wind tunnel data display.

Lin, Ching C.
Mentor: Dr. Inna Talmy
Springbrook High School
Montgomery County, MD

Investigated the phase diagram of the ceramic system $SrO*Al_2O_3-SrO*2SiO_2-BaO*Al_2O_3*2SiO_2$ to determine different molar ratio combinations of end members fired at different temperatures, by using x-ray diffractometry to determine phase composition and by measuring thermal expansion coefficients of samples in the system.

McCuster, John J.
Mentor: Mr. Lou Welanetz
Parkdale High School
Prince George's County, MD

Assisted in the development of a method for automatically reducing the high order detonation hazard of munitions due to adverse thermal environments.

Nelmon, Lara N.
Mentor: Dr. Stanley D. James
Magruder High School
Montgomery County, MD

Developed a lithium rechargeable electrochemical couple that has a high working voltage, high rate capability and an extensive operating life.

Quander, Latrece D.
Mentor: Ms. Verence Moore
Regina High School
Prince George's County, MD

Created a database to enable easy access to a more efficient filing system of over 1600 reports using the IBM PC-XT.

Rao, Suma M.
Mentor: Mr. Michael Swisdak
Thomas Wootton High School
Montgomery County, MD

Compiled a database for a collection of technical reports using an IBM-PC-XT computer. Transferred BASIC programs for a FORTRAN computer to a MacIntosh computer.

Scoles, Shawn P.
Mentor: Mr. John Holmes
Eleanor Roosevelt High School
Prince George's County, MD

Wrote original test programs for IBM subroutines from a scientific package that dealt with matrices and polynomials.

Stewart, Greg W.
Mentor: Dr. Walter Madigosky
Springbrook High School
Montgomery County, MD

Used the analysis of data obtained from a polymer laboratories' thermal analyzer and a patented resonance apparatus to study the effects of cross-linking on the dynamic mechanical properties of a series of urethane polymers.

Sharma, Narita
Mentors: Mr. Richard T. Whitman
Mr. Jim Myers
Paint Branch High School
Montgomery County, MD

Performed experiments to demonstrate the effects of radiation interactions with mater and demonstrate principles of radiation shielding.

Tegeler, Bret A.
Mentor: Mr. Donald Little
High Point High School
Prince George's County, MD

Learned drafting techniques for an air-conditioning project which included the mechanical, control, and electrical layouts and evaluated various possible conditions. Evaluated a firing chamber to determine necessity for methods of repair.

Thayer, Mark R.
Mentor: Mr. Brian Buell
Montgomery Blair High School
Montgomery County, MD

Designed a new ladder system and ramp for the basel analyzed a room renovation and repair cost estimate for a firing chamber, and engineered a toxic fuel storage area to meet safety requirements.

Tyer, Kristene A.
Mentors: Mr. Arnie Munach
Mr. Joseph Bagnall
Centennial High School
Howard County, MD

Designed a transfer block, fuze separator, voltage divider circuit, and a fuze fixture. Presented results of a series of tests to determine the frequencies of certain nozzles and turbines.

Ward, David A.
Mentor: Dr. Larry T Kabacoff
Walt Whitman High School
Montgomery County, MD

Determined the coefficient of thermal expansion of a sample by using a thermomechanical analyzer (TMA). Tested graphite aluminum metal matrix composites on the TMA under both heating and cooling conditions.

Warren, Glen A.
Mentor: Dr. Donald Ernst
John F. Kennedy High School
Montgomery County, MD

Recorded the current obtained from alkaline AA batteries discharged at a constant potential in order to develop a technique to predict the state of charge.

Wheeler, Theodore J.
Mentor: Dr. Lawrence Graeber
Newport Preparatory School
Montgomery County, MD

Designed an original computer program to take the output of a magnetometer through calculations to obtain results need to calibrate other magnetometers.

Williams, Mark B.
Mentor: Dr. Francis Kitzmiller
Saint Albans School
Washington, DC

Assisted a team of engineers and technicians in support of infrared security systems and a missile fuze system in their exploratory developmental stage. Built chassis boxes, laid out circuits, tested frequencies, and tested and evaluated hardware.

Wofford, Diane E.
Mentor: Dr. Richard Harrison
Paint Branch High School
Montgomery County, MD

Developed efficient acoustic energy absorbing tank linings that absorb sound energy rather than reflect it back to the source. Tested tank lining samples in a two inch diameter, 14 foot long guided wave tube, equipped with a pump and valve system to control pressure with a hydrophone at one end for both sending measured pulses of sound and receiving their reflections.

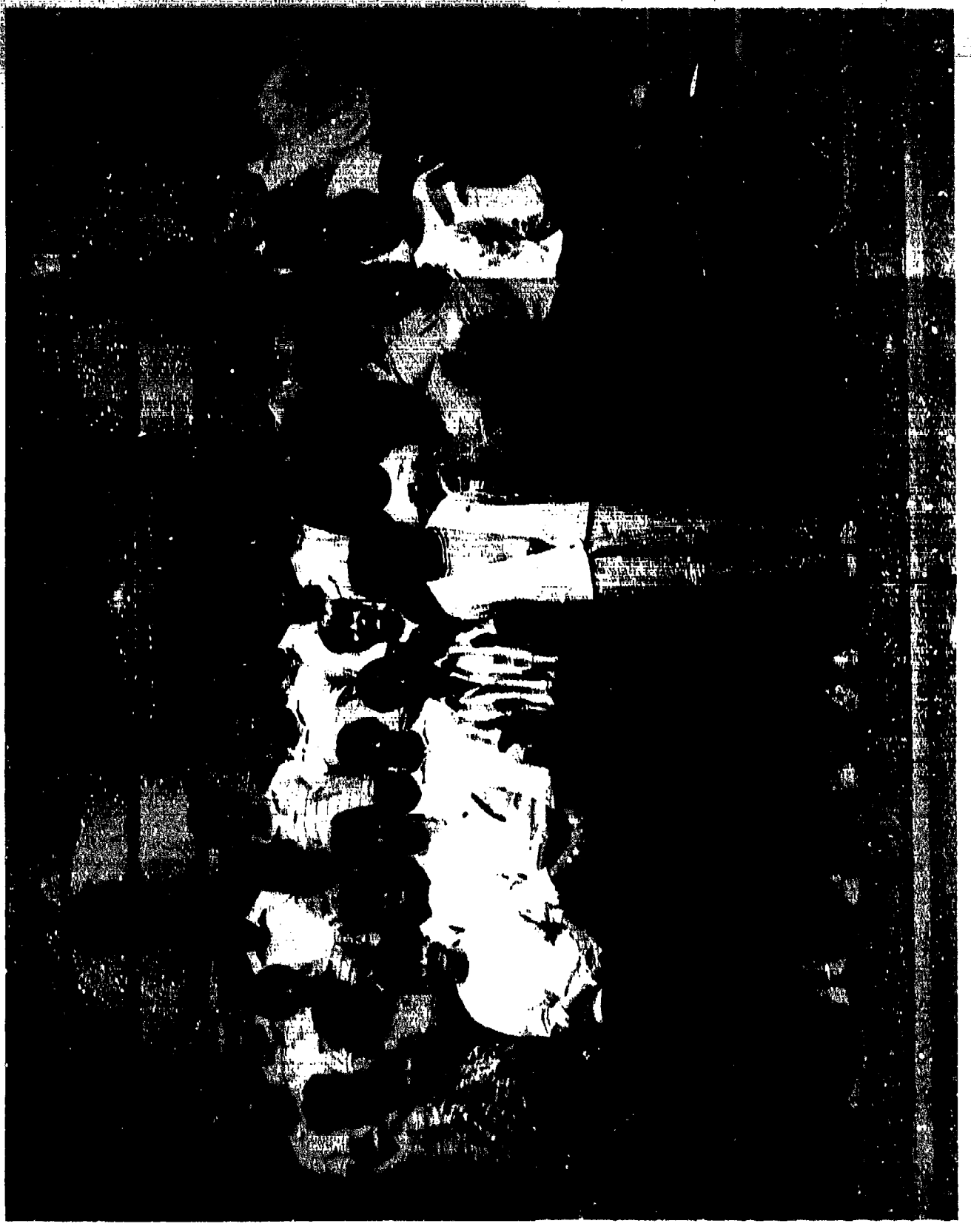
Woofter, Heather R.
Mentors: Mr. Leon Salviski
Mr. Tom Calisti
Hammond High School
Howard County, MD

Tested methods for removal or encapsulation of asbestos, in order to provide a safe and healthful working environment based on the set standards of the Occupational Safety and Health Administration and the Navy Occupational Safety and Health Program.

NIGHT VISION ELECTRO-OPTICS LABORATORY

AGENCY CONTACT
Ms. Mikki Collins
(DELNV-TM-PM)
Ft. Belvoir, VA 22060
(703) 664-2870

Conclasure III, Wyett H. Mentor: Mr. Chuck Jones J.E.B. Stuart High School Fairfax County, VA	Assisted with resolution tests on Anvis AN/PVS-5 night vision goggle monoculars. Learned how the FLIR system functions specifically in relation to the TOW missile system.
Erney, Kenneth M. Mentor: Mr. Michael Grenn Brentsville District High School Prince William County, VA	Developed an automated system for the collection of hall data in (HgCd)Te Epilayers using A10 Telsa super conducting magnet with cryostat.
Hughes, David W. Mentor: Mr. Jack H. Dinan Gonzaga College High School Washington, DC	Developed a device for spinning semiconductor substrates in preparation of molecular beame-pitaxy (MBE). Designed portable oven for heating semiconductors (GaAs specifically) during etching in preparation for etch pit density studies. Performed infrared transmission measurements using an infrared spectrophotometer.
Wood, Brian T. Mentor: Mr. Dave Bosserman Oakton High School Fairfax County, VA	Constructed a cryogenic cooler test set that automates laboratory test equipment through interconnection with a Hewlett Packard 150 computur.



UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES
AGENCY CONTACT
Dr. David Forman
Department of Anatomy
Bethesda, MD 20814 (301) 295-3219

Chen, Joy Y.
Mentors: Dr. Andrew S. Baum
Thomas S. Wootton High School
Montgomery County, MD

Studied the effects of unemployment stress on the immune system by measuring lymphocyte population counts. Blood samples were taken from subjects over a six-month period immediately following loss of employment.

Chou, Grace S.
Mentors: Dr. Ray Lake
Ms. Rosemarie Quirk
Seneca Valley High School
Montgomery County, MD

Studied radio enzymatic assays for the determination of phenylpropanolamine (PPA) in plasma which contained three plasma volumes in a standard curve. Measured concentrations of catecholamines in similar ways.

Colilla, Susan A.
Mentors: Dr. Jerome E. Singer
Ms. Diane Kuch
Walter Johnson High School
Montgomery County, MD

Investigated human analogous type A and type B behavioral patterns in an animal model using mongolian gerbils. Differentiated between type A and B gerbils by time estimation tests, run by a PASCAL program,in an operant conditioning chamber.

Cote, Piera M.
Mentors: Dr. Ana Mae Diehl
Dr. Marco Chacon
Academy of the Holy Cross
Montgomery County, MD

Performed assays on cultured hepatocytes to determine whether cyclic adenosine monophosphate (cAMP) modified the hepatotoxic effects of ethanol (EtOH). Concurrently, developed an animal model of chronic alcoholism which will be used subsequently to investigate the effects of EtOH on liver regeneration.

Eagleton, Jennifer B.
Mentors: Dr. Ana Mae Diehl
Walt Whitman High School
Montgomery County, MD

Performed tests to determine the hepatotoxic effects of Cyclic AMP (cAMP) on ethanol induced liver injuries.

Fang, Honoma T.
Mentor: Dr. David S. Forman
Walt Whitman High School
Montgomery County, MD

Used video microscopy to observe cellular movement and organelle development in the regeneration of tails of African clawed toad tadpoles, xenopus laevis.

Fang, Ningira T.
Mentor: CDR Dennis P. Nelson
Walt Whitman High School
Montgomery County, MD

Installed and tested MacIntosh, IBM PC, AT computers and evaluated graphics program, word processors and desktop utilities.

Golomb, Meredith R.
Mentor: Dr. Neil Grunberg
The Madeira School
Fairfax County, VA

Examined the relationship between nicotine and changes in body composition by monitoring the body weight, water and food consumption for rats treated with nicotine. Assays for water, fat, and protein content were performed on the carcasses.

Gross, Andrew J.
Mentor: Dr. David C. Beebe
Georgetown Day High School
Washington, DC

Investigated a method of labeling DNA, hybridizing such DNA to other DNA and RNA, and developing a technique of blotting mRNA onto nitrocellulose.

Kaufman, Teri
Mentor: Dr. Stefanie N. Vogel
Oxon Hill High School
Prince George's County, MD

Investigated the production of macrophages by CSF-1 and GM-CSF both functionally and differentially by comparing macrophages through Ia antigen expression, Fc receptor expression, and virus susceptibility.

Miles, David W.
Mentor: CDR Jerry A. Thomas
Walt Whitman High School
Montgomery County, MD

Wrote a computer program in Turbo PASCAL which analyzes digitized quality assurance (QA) films and calculates each of the three standard measurements normally made on QA films to maintaining a good QA program for x-ray film processing department.

Nevers, Tami L.
Mentor: Dr. David Krantz
Eleanor Roosevelt High School
Prince George's County, MD

Examined the patterns of physiological reactivity elicited by stress-inducing tasks in conjunction with cigarette smoking in women. Compared active tasks versus passive tasks to determine whether smoking has a stabilizing effect on certain physiological systems or if such as effect is determined by the pattern of arousal involved.

Hopson, Amy A.
Mentor: CPT Clayton Cisar
Walt Whitman High School
Montgomery County, MD

Learned the duties of a veterinarian and how to handle animals properly. Gave injections, observed surgical procedures, and collected samples for pathological assessment.

Patel, Rekha D.
Mentor: CPT Richard H. Rahe
Eleanor Roosevelt High School
Prince George's County, MD

Performed a study on the ex-hostages held in Iran to determine if they have recovered from the stress of captivity and if so, how long the recovery took.

Peipert, Linda I.
Mentor: Dr. Neil Grunberg
John F. Kennedy High School
Montgomery County, MD

Investigated the effects of nicotine on body composition, body weight, food consumption, and water consumption by examining nicotine's effect during and after drug administration by measuring the subject's weights' and the amount of food and water consumed daily.

Reilly, Joseph J.
Mentor: Dr. Tony A. Fitz
Bishop Ireton High School
Alexandria, VA

Studied the characteristics of the reproduction, steroidogenesis and cyclic adenosine monophosphate production in virus transformed rat granulosa cells.

Shah, Shailan B.
Mentor: Dr. Tony A. Fitz
Springbrook High School
Montgomery County, MD

Used radioimmunoassay to determine the amounts of cyclic adenosine monophosphate (cAMP) and steroids produced by transformed rat granulosa cells in response to the secretagogue cholera toxin, forskolin, isoproterenol, 25-hydroxycholesterol, and prostaglandin E2.

Singer, Mike A.
Mentor: Dr. Kathryn Lynch
John F. Kennedy High School
Montgomery County, MD

Conducted morphometric analysis of microscopic sections of muscle tissue to further understand the process of muscle development.

Ursano, Amy M.
Mentor: Dr. Andy Baum
Bethesda-Chevy Chase High School
Montgomery County, MD

Studied the effects of unemployment stress on the immune system using lymphocyte population counts to measure the effects. Blood samples were taken from subjects over a six-month period immediately following loss of employment.

Wolf, Marisa L.
Mentor: Dr. Mark Rollag
Dr. Bea White
Springbrook High School
Montgomery County, MD

Developed amphibian dermal melanophore culture methods to be used in the future to study the molecular mechanism of melatonin action.

UNITED STATES NAVAL ACADEMY
AGENCY CONTACT
Ms. Noreen Rice
Employee Development
Civilian Personnel Department, Holligan Hall
Annapolis, MD 21402
(301) 267-2783

Jones, Charles A.
Mentors: Dr. J. Alan Adam
Mr. Steve Saterfield
Andover High School
Anne Arundel County, MD

Used a VAX main-frame computer with a UNIX operatingsystemand the software package MOVIE.BYU for computer aided modeling; entered data of a shaft seal into a file from blue prints and manipulated into a three dimensional computer model.

Baccala, Brent W.
Mentor: Dr. David Roger
Chesapeake High School
Anne Arundel County, MD

Worked on run length encoding, a means of taking a graphic image for display on a frame buffer and compressing it into a reasonably compact format.

Donaldson, Kendall E.
Mentor: Mr. John Ertel
Glen Burnie High School
Anne Arundel County, MD

Designed a BASIC computer program which illustrates and analyzes the normal distribution of random numbers. Made numerous sketches and measurements to illustrate an experiment dealing with the effects resulting from the interruption of ultrasonic sound waves.

Doby, Mark L.
Mentor: Mr. Al Holder
Severna Park High School
Anne Arundel County, MD

Studied techniques of paint manufacturing including paint ingredients, functions, and testing procedures for special purpose formulations.

Espeseth, Craig D.
Mentor: Ms. Karen Vorous
Eleanor Roosevelt High School
Prince George's County, MD

Studied the proper steps in setting up an aquarium, including the proper type of tank, subgravel filter, outside filter, and the gravel, to ensure the biological, mechanical, and chemical filtration and proper maintenance procedure.

Hansen, Julie A.
Mentor: Dr. Thomas Bitterwolf
South River High School
Anne Arundel County, MD

Synthesized organometallic compounds for analysis; purified compounds by chromatography and recrystallization; verified and analyzed the compounds with NMR spectroscopy, IR spectroscopy and mass spectroscopy.

Miller, Brian N.
Mentor: Mr. Doug Afdahl
Annapolis Senior High School
Anne Arundel County, MD

Received instruction in the use and the basic structure of microcomputers. Conducted special work in order to aid in the integration of the Zenith Z-248 microcomputer.

Pavlosky, Karen M.
Mentor: Dr. Russell D. Jamison
Meade Senior High School
Anne Arundel County, MD

Explored and analyzed the properties of graphite-epoxy resin laminates through destructive non-destructive testing. Developed a computer program to regulate and retain information vital to the continuation of such research.

Peters, Deborah A.
Mentor: Mr. John P. Ertel
Severna Park Senior High
Anne Arundel County, MD

Developed an original program to display the pattern caused by the normal distribution generated by random numbers. Made technical sketches with accurate measurements to illustrate experimental apparatus dealing with the interruption of ultrasonic sound waves.

Rivers, William P.
Mentor: Dr. Russell D. Jamison
Chesapeake Senior High School
Anne Arundel County, MD

Determined and analyzed specific elements of graphite-resin epoxy intraply composite behavior. Tested and examined impact damaged and undamaged specimens using a variety of techniques, both destructive and non-destructive in nature.

Schneeberg, Brian D.
Mentor: Mr. Doug Afdahl
Chesapeake High School
Anne Arundel County, MD

Obtained a detailed knowledge of the diversified uses of microcomputers through the use of Apple MacIntosh, IBM-PC, Epson Equity I, and the Zenith 248 microcomputers.

Weissinger, Thomas R.
Mentor: Ms. Karen Vorous
Annapolis High School
Anne Arundel County, MD

Analyzed water samples using the Technicon Auto-Analyzer II system hooked up to an Apple IIe computer.

Whitmer, Jr., Gilbert F.
Mentor: Ms. Sharon Dahlgren
Glen Burnie Senior High School
Anne Arundel County, MD

Assisted in the preparation of an interactive video system using video material enhanced by the ability of the computer to question, explain, and highlight foreign language instructions at USNA.

UNITED STATES NAVAL OBSERVATORY
AGENCY CONTACT
Dr. Gart Westerhaut
34th & Massachusetts Avenue, NW
Washington, DC 20390
(202) 653-1513

Caplan, Jonathan S.
Mentor: Dr. Robert Harrington
Woodrow Wilson High School
Washington, DC

Measured star positions in the Praesepe cluster over six years to determine accuracy and tendencies as compared with observations from other observatories.

Davis, Stephanie A.
Mentor: Ms. F.N. Withington
Connelly School of the Holy Child
Montgomery County, MD

Created a new mailing list in database format using the Aston/Tate software, dbase3+ for the Time Service Department.

Heister, Deborah A.
Mentor: Dr. David Florkowsky
Saint Agnes School
Alexandria County, MD

Used the WINK computer program to analyze light curves of the eclipsing binary star UW Eridani and determined elements of the star system.

Pace, Tara S.
Mentor: Ms. F.N. Withington
Theodore Roosevelt High School
Washington, DC

Used computer plots to study residuals of stars from the Washington PZT catalog to determine if there was any systematic motion changes.

Scherrer, Peter R.
Mentor: Mr. Randolph T. Clarke
Woodrow Wilson High School
Washington, DC

Adjusted a Master clock using the IBM 4341 and Series 1 to determined the mean. Learned FORTRAN 66 to create two programs and mapped and stored all clock vaults.

Schultz, Paul D.
Mentor: Mr. Theodore Rafferty
McLean High School
Fairfax County, VA

Prepared a public information brochure to answer basic questions about astronomy.

Zamoff, Jamie B.
Mentor: Mr. Theodore Rafferty
Woodrow Wilson High School
Washington, DC

Wrote a public affairs brochure about the activities of the astrometry division, 26-inch refracting telescope, and 6-inch transit circle telescope.

UNITED STATES ARMY MISSILE COMMAND
RESEARCH, DEVELOPMENT, AND ENGINEERING CENTER
Agency Contact
Dr. Katie Blanding
Redstone Arsenal, AMSMI-RD-RE
Huntsville, Al. 35898-5000

Anders, Chris
Mentor: Dr. Richard
Falkville High School
Morgan County, AL

Created program, INDEX, to help engineers locate and use data on micro-circuits. The program stores micro-circuit data from two major missile systems using the HP 200 computer.

Baeder, Brian
Mentor: Mr. Robert Haack
Hazel Green High School
Madison County, Al

Investigated paint coatings. DK-D and FC-J which compared the reflectivity of uncoated copper plates to the reflectivity of the plates coated with varying paint mixtures. Results proved be unbeneficial to the Guidance and Control Directorate.

Blocksome, Will
Mentor: Mr. David Lanteigne
Hartselle High School
Morgan County, AL.

Wrote BASIC and FORTRAN programs to print grey level representations of graphs on a dot matrix printer. Interfaced a Quantex Video digitizer and a Zenith Z-100 computer by using an IEEEE-488 bus and the Forth language.

Braddock, Christy
Mentor: Mr. Chris Roberts
Decatur High School
Morgan County, AL

Wrote four programs and devised two engineering illustrations in BASIC to determine the total length of fibers and standard deviation of a number of data points. Created a program which transferred HP 9845B to a matrix inversion program on the IBM.

Brindley, Becky
Mentors: Dr. Joe McDonald
Dr. Ann Stanley
Huntsville High School
Madison County, AL

Studied the laser photololysis of 3-chloro propyne and 3-chloro propene, specifically propargyl and allyl chlorides, to determine varying yields of different hydrocarbon under different pressure conditions.

Frey, Lauri
Mentor: Ms. Barbara Marsh
Randolph High School
Madison County, Al

Studied the effect of moisture on mechanical properties of QBJ-29 propellant at zero and sub-zero temperatures to determine the changes in reliability of humidity-aged propellant at low temperatures.

Gross, Eric
Mentor: Dr. James Oliver
Athens High School
Limestone County, Al.

Studied the bi-directional communication between analog and digital computers by combining them to form a hybrid computer. The study showed the accuracy at real time and suggested methods for accurate measurement at greater speeds.

Hall, Richard
Mentor: Mr. Tom Killough
Athens High School
Limestone County, AL

Studied the performance analysis of the precision Deep Attach Missile System (PDAMS) which describes how flight test data has been used to analyze and determine the actual parafoil performance in the PDAMS program.

Harris, Murray Hood
Mentor: Dr. Charles Bowden
Decatur High School
Morgan County, AL.

Studied the iterative exploration of equations as a technique for solving, expanding, and exploring equations.

Harris, Rita
Mentor: Mr. Mike Crowe
Tanner High School
Limestone County, AL

Designed a hex, decimal, and binary number conversion program which allows the user to enter any number and obtain the equivalence in the three number systems.

Hicks, Sean
Mentor: Mr. Kelly McQuire
Ardmore High School
Limestone County, AL

Developed a computer program on an HP 9000, to assist in the data acquisition of bend tests used to determine the stiffness parameters of rocket motor cases.

Holmes, Michael
Mentor: Mr. George Williams
Albert P. Brewer High School
Morgan County, Al.

Updated and standardized versions of Apple MacIntosh computer software used throughout the directorate.

Keal, Kerry
Mentor: Dr. James Oliver
Virgil I. Grissom High School
Madison County, AL

Developed a remote guidance system by 1) building a voltage controlled oscillator to test a Gould Waveform Recording System; 2) transferring information between analog and digital computers through a data acquisition control unit; 3) using a geometric computer modeling program to analyze stress on mechanical parts, and 4) navigating a remote control robot using data received from a video camera.

Lewis, Amy
Mentor: Dr. Joe McDonald
Hartselle High School
Morgan County, AL

Studied the laser photololysis of 3-chloro propyne and 3-chloro propene, specifically propargyl and allyl chlorides, to determine varying yields of different hydrocarbons under different pressure conditions.

Little, Michelle
Mentor: Mr. Ken Herren
Decatur High School
Morgan County, AL

Investigated using C (computer language) for digital optical processing by the translation of certain digital optical processing routines written in BASIC and FORTRAN.

Mallox, David
Mentor: Dr. Henry Stern
Huntsville High School
Madison County, AL.

Developed and explored a systematic method for searching for a moving target (missile system) on the Digital VAX 11/780. This is called a helical scan seeker procedure.

Pessoney, Sandy
Mentor: Mr. Robert Johnson
Virgil I. Grissom High School
Madison County, AL

Investigated the effects of the laser-induced reaction of methanol (CH_3OH), d-methanol (CH_3OD), and D_4-methanol (CD_3OH) and its deuterated forms.

Richards, Wendy
Mentor: Dr. Siegfried Lehnigk
Randolph High School
Madison County, AL

Studied a procedure to determine the shape of a probability distribution function using the values of three parameters.

Smith, Scott
Mentor: Dr. Ann Stanley
Huntsville High School
Madison County, AL

Researched the laser induced decomposition of germane, GeH_4, with the addition of a sensitizer, sulfur hexafluoride (SF_6), to find a higher percent conversion for the formation of germanium than previous obtained.

Taylor, Travis
Mentor: Dr. Tom Honeycutt
Albert P. Brewer High School
Morgan County, AL

Conducted experiments which might lead to the possible phase conjugation of dye lasers to give them a much better beam quality. The results achieved indicated that the desired beam quality improvements can be achieved.

Wilson, Lucas
Mentor: Dr. Arthur Werkheiser
Randolph High School
Madison County, AL.

Established office automation on the Intel 310-40 microcomputer, utilizing the Xenix 286 operating system, and the Intel database information system including initialization, installation and ineo-taped courses and academically oriented seminars.

Worcester, Kevin
Mentor: Dr. Don Gregory
East Limestone High School
Limestone County, AL

Investigated optical computing by the development of a highly selective tracking system using an optical correlator which will help to improve national defense and generate new technology.

WALTER REED ARMY INSTITUTE OF RESEARCH
AGENCY CONTACT
Dr. James McNeil
Forest Glen
Washington, DC 20012
(202) 576-3472

Baccus, Lynnette D.
Mentor: Dr. D.K. Ohashi
Surrattsville High School
Prince George's County, MD

Studied streptococci by using bacteriologic techniques and tested the hypothesis.

Harrison, Joseph P.
Mentor: Mr. Ed Rowton
Oxon Hill High School
Prince George's County,MD

Investigated the cause of cutaneous, and mucocutaneous, visceral pathology in humans to determine the percent of sandflies that are inflected with leishmania, a protozoan parasite.

Benn, Samuel D.
Mentor: CPT John Leu
Ballou High School
Washington, DC

Wired and tested connections to a Digital PDP 11/73 computer and chamber for memory retention research on the behavior of squirrel monkeys.

Brown, Ryan A.
Mentor: Dr. Lillie Tang
Oxon Hill High School
Prince George's County, MD

Studied the effects of Pirenzepine and other possible agents on the Muscarinic Receptor of the red blood cell.

Brumhart, Susanne M.
Mentor: CPT John Leu
Connelly School, Holy Child
Montgomery County, MD

Investigated the circadian and estrus related behavior patterns influencing activity level, feeding and weight gain in rats before and after ovariectomies.

Casey, Michael R.
Mentor: Dr. William Fishbein
Gonzaga College High School
Washington, DC

Wrote computer programs which ran on the Lotus business package and the Wang Basic system to do statistical analysis and graphics of massive amounts of experimental test data in enzymatic research.

Chandra, Rahesk k. Mentor: Ms. Loutisha Templeman Springbrook High School Montgomery County, MD	Studied the techniques of electron microscopy to determine the ultra structure of cells for diagnostic support in soft tissue and Orthopedic Departments.
Chakraharty, Prabir Mentors: Dr. Frank B. Johnson Mrs. Hilda B. Alpaugh Good Counsel High School Montgomery County, MD	Analyzed examples of calculi using the Diffractomer, the x-ray Powder Diffraction Camera, the infrared spectrophotometer Scanning Electron Microscope and wet chemistry analysis to prove which method is most satisfactory.
Corkins, Suzanne F. Mentor: Dr. Lisa Shipley Oakton High School Fairfax County, VA	Investigated an 8-aminoquinoline derivative in hamsters in order to isolate the hepatic enzyme system responsible for drug metabolism to determine if it is possible to differentially induce the production of key metabolites.
Comegin, Michelle R. Mentor: Mr. Victor LaGrange High Point High School Prince George's County, MD	Developed skills, knowledge, methods, and procedures needed to use medical audio visual equipment necessary to provide quality medical graphics illustrating the investigator's medical research.
Fan, Michael Y. Mentor: Dr. Pezeshkpour Thomas Wootton High School Montgomery County, MD	Used the videoplan computer to research the motor and sensory functions of muscles and nerves by making quantitative observations nerve fibers.
Fay, Andrew I. Mentor: Dr. Glenn N. Wagner Saint Anselm's Abbey school Washington, DC	Studied the basics of forensic, particularly hair and fiber analysis and in relation to identification of victims and causes of death.

Fe[illegible]n, Peter H.
Mentor: Dr. Robert H. Reid
Woodrow Wilson High School
Washington, DC

Conducted research to develop an in vitro assay to test the immunogenicity of a synthetic peptide vaccine construct, to determine if the amino acid peptide of the cholera toxin B chain can function as a carrier and to use to determine if MDP derivatives will as act as adjuvants against E. coli induced diarrhea.

Finn, Aloke V.
Mentor: Dr. Abe Macher
Sidwell Friends School
Washington, DC

Studied the tumors and opportunistic infections associated with acquired immune deficiency syndome when a virus (HIV) destroys the T-helper lymphocytes.

Finn, Arti V.
Mentor: Dr. Abe Macher
Phillips Exeter Academy
Rockinham County, NH

Studied the tumors and opportunistic infections associated with acquired immune deficiency syndome when a virus (HIV) destroys the T-helper lymphocytes.

Frankel, Shlomit R.
Mentor: Ms. Claudia Golinda
Yeshiva of Greater Washington
Montgomery County, MD

Studied the comparison of in vivo and in vitro acetylcholin esterase reactivators following diisopropyl fluorophosphate poisoning.

Gibbons, Meghan K.
Mentor: Mr. Paul Zimmerman
Sidwell Friends School
Washington, DC

Quantitatively studied five metals in animal tissue using an atomic absorption spectrophotometer to compare and judge the accuracy of the normal values and the procedure.

Habash, Lana
Mentor: Dr. Renata Engler
Oxon Hill High School
Prince George's County, MD

Studied the washed leukocyte procedure to examine the percentage of histamine released from a patient's basophils when a history of allergic reaction to bee stings exists.

Harbin, Charles J.
Mentor: Ms. Tessa Burnag
McDonogh High School
McDonogh, MD

Studied the washed leukocyte procedure to examine the percentage of histamine released from a patient's basophils when a history of allergic reaction to bee stings exists.

Hwang, Amy V.
Mentors: Dr. Nesbitt Brown
Dr. June Whaun
Rockville High School
Montgomery County, MD

Assayed erythroid hemoglobin and acetylcholinesterase spectrophotometrically to determine the ability of the K562 leukemia cell line to generate fetal erythroid colonies afterinduction with hemoglobin.

Koa, Tracy
Mentor: Dr. Nancy A. Roth
Paint Branch High School
Montgomery County, MD

Studied the isolation of ainghaosu from plants in the artemisia family.

Kramer, Paul A.
Mentor: Dr. Max Robinowitz
Paint Branch High School
Montgomery County, MD

Examined files of patients with cardiac involvement in Fabry's disease in order to extract case information to describe cardiac manifestations and its clinical treatment in the coronary arteries.

Krieg, Eric R.
Mentors: Dr. Meade Pimsler
Dr. Wayne M. Meyers
Parkland Junior High School
Montgomery County, MD

Studied the optimum cultural conditions for B-cell proliferation and determined the effects of mycobacterium ulcerans toxin measured by plaque assay and tritiated thymidine uptake.

Kuchma, Christine L.
Mentor: Mr. Don Hemmett
Dixon Hill High School
Prince George's County, MD

Due to personal difficulties unable to attend the full-eight weeks. Therefore, no paper was submitted.

LaGrange, Ricardo D.
Mentor: Mr. J. R. Burge
Bethesda Chevy Chase High School
Montgomery County, MD

Used a statistical software package to computerize data from a retrospective study to evaluate the efficiency of surgery on repair of the cleft palate in patients over 11 years old. Edited and analyzed the data using various graphical techniques.

Langlois, Maureen A.
Mentor: Dr. Renu Virmani
National Cathedral School
Washington, DC

Studied the histologic features found in heart patients who died with viral myocarditis and correlated with clinical parameters extracted from the medical and autopsy records.

Larrick, Douglas C.
Mentor: Dr. Maurice Swinnen
Sherwood High School
Montgomery County, MD

Studied the effects of electronics in a research environment.

McDonald, Stacey M.
Mentor: Capt G.A. Andrews
Benjamin Banneker High School
Washington, DC

Conducted an experiment to extract and purify the AF/R1 pilus extracted from pure cultures of the rabbit diarrheogenic Escherichia coli.

Mess, Frances M.
Mentor: LT Kevin Baird
Academy of the Holy Cross
Montgomery County, MD

Identified parasites in tissue section of liver and studied pathological changes and morphological characteristics of the phylum pentastomida.

Mihalik, Steven J.
Mentor: Dr. Daniel B. Raybuan
Springbrook High School
Montgomery County, MD

Studied the significant changes on the blood volume in the pulminary system of sheep exposed to varying amounts of carbon monoxide.

Mitchell, James F.
Mentor: Dr. Michael A. Clark
Montgomery Blair High School
Montgomery County, MD

Extracted pertinent information from suicide case reports and entered into a database for analysis and comparison of suicides to determine cause of death.

Oh, King C.
Mentor: Dr. Lytt Gardner
Oakton High School
Fairfax County, VA

Wrote a statistical program to compute, analyze and test sleeping distance data affecting the spread of meningococcal disease in open sleeping bays.

Pao, Duke G.
Mentor: Dr. Frank Tortella
John F. Kennedy High School
Montgomery County, MD

Constructed and tested a kindling seizure model to study the pharmacology and mechanisms of anticonvulsant drugs for the prevention and cure of epilepsy.

Pau, James Jr., S.
Mentor: Dr. Larry Agodoa
John F. Kennedy High School
Montgomery County, MD

Analyzed urine taken from human beings under stress utilizing a high performance liquid chromatography column to measure the levels of catecholamine and catecholamin metabolites to determine the effects of stress.

Park, Aimee S.
Mentor: Dr. Jean M. Karle
Oakton High School
Fairfax County, VA

Studied the effects of radioprotectant drugs on the glucocorticoid steroid receptor.

Patterson, Richelle A.
Mentor: Dr. George Sangleer
High Point High School
Prince George's County, MD

Did step by step photographic processing to provide quality prints necessary in the medical photo section.

Prather Jr., Stewart G.
Mentor: Mr. Victor LaGrange
Dixon Hill High School
Prince George's County, MD

Worked in the Department of Medical Graphics as a support group in supplying illustrative work, charts, graphs, certificates learning and utilizing necessary techniques and skills.

Reimer, Gretchen M.
Mentor: Ms. Joan M. Macdonell
James W. Robinson Secondary
Fairfax County, VA

Compiled a comprehensive list of all Indian specimen acquisitions to the Armed Forces Medical Museum since its origin (1862 - 1986) and recorded their disposition.

Reinhard, Michael A.
Mentor: CPT Gerard P. Andrews
Glenelg High School
Howard County, MD

Extracted rabbit diarrheogenic Escherichia coli strain RDEC-1 by homogenization and ammonium sulfate precipitation of cultures to determine an efficient method for partial purification of mucosal adherence factor.

Ross, Michael I.
Mentor: CPT Joseph B. Long
Glenelg High School
Howard County, MD

Conducted a study of the endogenous vasoconstrictor vasopressin to determin a cause and effect between ischemia and paralysis in a rat.

Schoppelrei, Joseph W. Mentor: SSGT James DeShong St. John College High School Washington, DC	Conducted a study to compare the effectiveness and complications of utilizing intraosseous infusion sites with standard central and peripheral intravenous sites on the lungs and bone marrow surrounding the infusing site in pigs.
Sharkey, Michael T. Mentor: Dr. Lytt Gardner Woodrow Wilson High School Washington, DC	Statistically analyzed data from a meningocaccal carriage survey conducted on recruits at Ft. Benning, Georgia to determine bunk distance in the spread of the disease.
Shaver, Donald W. Mentor: Dr. Tess Bunney Oxon Hill High School Prince George's County, MD	Evaluated an immunodepressed patient's humoral and cellular immunity using in vitro lymphocyte proliferation and hemolytic plaque assay.
Sumler, Jennifer Mentor: Dr. George J. Sangeleer Benjamin Banneker High School Washington, DC	Provided medical photographs, color slides, ozalids, black & white prints and color prints to the Division of Medical Audio/Visual Services.
Thornton, Sophia R. Mentor: Mr. James Armstrong Rabaut Junior High School Washington, DC	Studied the quantification of antism autoantibodies in sera of patients with systemic lupus erythematosus.
Walker, Karen L. Mentor: Mr. Victor E. LaGrange LaReine High School Prince George's County, MD	Used many techniques including the compugraphic composition system, in the Audio Visual Department to prepare artwork for medical presentations.
Wiggert, Kristian E. Mentor: Ms. Hilda Alpaugh Springbrook High School Montgomery County, MD	Analyzed seven renal calculi and gallstone samples to determine their chemical composition and recommended the x-ray graph for overall ease of use, speed and accuracy.
Zurer, Jonathan L. Mentor: Ms. Maria Thomas Woodrow Wilson High School Washington, DC	Worked in Motion Picture Department and did basic photographic processing.

APPENDIX B
RECRUITING MATERIAL ALL PROGRAMS

University of the District of Columbia

4200 Connecticut Avenue, N.W.
Washington, D.C. 20008

Department of Defense
SCIENCE & ENGINEERING APPRENTICE PROGRAM

June 23 - August 15, 1985
APPLICATION DEADLINE: January 20, 1986

TEACHERS OF SCIENCE AND MATHEMATICS
National Capital Area High Schools

Dear Teacher,

The Department of Defense is again implementing the program in which meaningful summer research experience will be offered to selected high school students. We are looking for students who have the potential to pursue successful careers in science, engineering and mathematical fields. Selection will be made according to the following criteria:

1. strong interest in science, engineering, mathematics and computer applications;

2. science and mathematics courses taken and grades attained;

3. scores on national standardized tests;

4. teacher recommendation;

5. extracurricular interests and activities.

As you can see, teacher recommendation will play an important part. You, as the science or math teacher, can spot the student whose grades may be below the straight A level because he or she is not challenged. If you feel that a student has the potential, we will try to give that student the opportunity.

We are enclosing ten forms. The students should be given both the brochure and the application, and advised that the form must be carefully written so that each is legible. Each student is responsible for transportation to and from the job site.

Please note that the students selected will receive a stipend as well as invaluable experience and exposure to the world of scientific research. U. S. citizenship is required.

Time is of the essence since full security clearance procedures must be instituted by some of the laboratories. We would appreciate having applications, student paragraph, letter of recommendation, and transcripts sent out as quickly as possible, but not later than the deadline, 20 January 1986

B-139

Sincerely yours,

B-141

DEPARTMENT OF DEFENSE (DoD)

1986 SUMMER SCIENCE AND ENGINEERING APPRENTICE PROGRAM
For High School Students

June 23 - August 15, 1986

An Army-Navy Initiative in the National Captial Area

Uniformed Services University of the Health Sciences
Jones Bridge Rd., Bethesda, Md.
Medical, Microbiology, Chemistry, Computer Science

United States Naval Observatory
Northwest, Washington, D.C.
Astronomy, Timekeeping, Mathematices, Computer Science, Electronics

Walter Reed Army Institute of Research
Northwest. Washington, D.C.
Medical, Computer Science, Biochemistry

A completed application consists of:

1. Student Application Form
2. Personal Statement
3. Teacher Recommendation
4. Transcript, including standardized test scores wherever possible.

Send To:

M. Krupsaw, Program Director
University of the District of Columbia
Box 9999
4200 Connecticut Avenue, N.W.
Washington, D.C. 20008

APPLICATION DEADLINE:
January 20, 1986

The University of the District of Columbia provides equal opportunity for all persons in its educational programs and activities. The University does not discriminate on the basis of race, creed, color, national origin, age, handicap or sex.

Are You Interested in Science and Math?
The DEPARTMENT OF DEFENSE sponsored summer Science and Engineering Apprentice Program can provide invaluable experience and exposure to the world of scientific research. This program offers paid apprenticeships for high school students interested in science and engineering. The students are assigned to a Department of Defense laboratory in the National Capital area to work with a scientist or engineer who serves as mentor to the apprentice for eight weeks, June 23 - August 15, 1986.

Applications
See your science teacher for an application form. Send the form, along with your transcript, a teacher recommendation, and a short paragraph about yourself and your interest and accomplishments in science to:

M. Krupsaw, Program Director
University of the District of Columbia
Box 9999
4200 Connecticut Avenue, N.W.
Washington, D.C. 20008

Application Deadline - January 20, 1986

All students selected for the 1986 Summer program will be notified by May 1, 1986. If you have not heard by this date, it was not possible to arrange a placement for you this year. Your application will be matched with a job description submitted by a scientist at a participating Department of Defense laboratory and sent to that scientist. The scientist will interview candidates and make a final selection.

Selection
Students will be selected on the basis of grade, science and mathematics courses taken, scores on national standardized tests, areas of interest, and teacher recommendation.

All applicants must be U.S. citizens. In some laboratories, security clearance is required.

Support stipends of $1000.00 will be provide for the eight weeks. Each student is responsible for transportation to and from the job site.

PARTICIPATING LABORATORIES

Armed Forces Institute of Pathology
Northwest, Washington, D.C.
Medical, Computer Science

Army Research Institute
Eisenhower Ave., Alexandria, Va.
Behavioral Science, Computer Science

Balistics Research Laboratory
Aberdeen, Md.
Physics, Engineering, Chemistry, Computer Science

Belvoir Research & Development Center
Gunston Rd., Ft. Belvoir, Va.
Physics, Chemistry, Engineering

Chemical Research & Development Center
Edgewood, Md.
Physics, Engineering, Chemistry, Computer Science, Medical

U.S. Naval Academy
Annapolis, MD
Chemistry, Computer Science, Engineering, Physics

David Taylor Naval Ship Research & Development Center
Bethesda, Md. & Annapolis, Md.
Engineering, Physics, Computer Science, Chemistry, & Math with Computer Applications

Engineering Topographic Laboratory
Telegraph Rd., Ft. Belvoir, Va.
Physics, Engineering, Math, Computer Science

Ft. Detrick
Frederick, Md.
Chemistry, Computer Science, Medical, Engineering

Harry Diamond Laboratories
Powder Mill Rd., Adelphi, Md. & Woodbridge, Va.
Physics, Engineering, Chemistry, Computer Science

Naval Medical Research Institute
Wisconsin Ave., Bethesda, Md.
Medical, Computer Science, Chemistry, Physics

Naval Research Laboratory
Southeast (off 295) Washington, D.C.
Physics, Engineering, Chemistry, Computer Science

Navel Surface Weapons Center
White Oak, Md. and Dahlgren, Va.
Engineering, Physics, Computer Science Chemistry, Electronics

Night Vision & Electro-Optics Labcratories
Gunston Rd., Ft. Belvoir, Va.
Physics, Engineering, Computer Science

UNIVERSITY OF THE DISTRICT OF COLUMBIA
Summer 1986

APPLICATION DEADLINE:
January 20, 1986

Department of Defense
Summer
SCIENCE & ENGINEERING
APPRENTICE PROGRAM

June 23 - August 15, 1986

STUDENT APPLICATION FORM

Last Name First Middle Male Female Date of Birth Age

Home Address: Street City State Zip

Area Code Home Phone Social Security Number Citizenship

Are you: _____

Asian American/Pacific Islander American Indian White Black Hispanic Other
(The information requested on race is not required. Your answer is strictly VOLUNTARY.)

Present Grade Name of High School Principal

Address of School: Street City State Zip County

Were you in the Science Apprentice Program before? _____
Yes No Where? When?

Major academic interests: _____

List the science activities in which you participated (in and outside of school):, hobbies & special interests

Do you have computer programming experience? ____ Which languages? _____

List the science, related computer, and mathematics courses you have taken or are presently taking.

Course Letter Grade Course Letter Grade Course Letter Grade Course Letter Grade

Course Letter Grade Course Letter Grade Course Letter Grade Course Letter Grade

(OVER)

FOR MENTORS ONLY

Mentor _____ DoD Laboratory _____

Mailing Address _____

Building _____ Room _____ Phone _____

Date Interviewed _____ Date Notified of Acceptance _____

FOR OFFICE USE ONLY

B-145

_____ Entered computer _____ Letter sent _____ Received

I would like an apprenticeship at one of the following laboratories (list in order of preference).

	PARTICIPATING LABORATORIES	RESEARCH EMPHASIS
____	Armed Forces Institute of Pathology Northwest, Washington, D.C.	Medical, Computer Science
____	Army Research Institute Eisenhower Ave., Alexandria, Va.	Behavioral Science, Computer Science
____	Ballistics Research Laboratory Aberdeen, Md.	Chemistry, Physics, Engineering, Computer Science
____	Belvoir Research & Development Command Gunston Rd., Ft. Belvoir, Va.	Physics, Chemistry, Engineering
____	Chemical Research & Development Center Edgewood, Md.	Chemistry, Physics, Medical, Engineering, Computer Science
	David Taylor Naval Ship Research & Development Center	Engineering, Physics, Computer Science, Chemistry & Math with Computer Applications
____	Annapolis, Md.	
____	Bethesda, Md.	
____	Engineering Topographic Laboratory Humphreys Engineering Center, Telegraph Rd. Ft. Belvoir, Va.	Physics, Engineering, Math, Computer Science
____	Ft. Detrick Frederick, Md.	Chemistry, Medical, Engineering, Computer Science
____	Harry Diamond Laboratories Powder Mill Rd., Adelphi, Md.	Physics, Engineering, Chemistry, Computer Science
____	Woodbridge, Va.	
____	Navy Medical Research Institute Wisconsin Ave., Bethesda, Md.	Medical, Computer Science, Chemistry, Physics
____	Naval Research Laboratory Southeast (off 295), Washington, D.C.	Physics, Engineering, Chemistry, Computer Science
____	Naval Surface Weapons Center White Oak, Md.	Engineering, Physics, Computer Science, Chemistry, Electronics
____	Dahlgren, Va.	
____	Night Vision and Electro-Optics Laboratories Gunston Rd., Ft. Belvoir, Va.	Physics, Engineering, Computer Science
____	Uniformed Services University of the Health Sciences Jones Bridge Rd., Bethesda, Md.	Medical, Microbiology, Chemistry, Computer Science
____	United States Naval Observatory Northwest, Washington, D.C.	Astronomy, Timekeeping, Mathematics, Computer Science, Electronics
____	Walter Reed Army Institute of Research Northwest, Washington, D.C.	Medical, Computer Science, Biochemistry
____	U.S. Naval Academy Annapolis, Md.	Chemistry, Computer Science, Engineering, Physics

NOTE: *Because of the volume of applications we receive, it will not be possible to acknowledge receipt of each. A stamped self-addressed post card will be returned upon receipt if included.*

A completed application consists of:

1. Student Application Form
2. Personal Statement
3. Teacher Recommendation
4. Transcript including standardized test scores wherever possible.

Send to:

M. Krupsaw, Program Director
Box 9999
University of the District of Columbia
4200 Connecticut Avenue, N.W.
Washington, D.C. 20008

18 September 1985

TO: Senior High School
Teachers of the Physical Sciences,
National Capital Area

In order to ensure an adequate science and engineering manpower base and to improve the technological literacy of the Nation, the Department of Defense feels it essential that public and private secondary school teachers enhance student motivation and performance in science. To this end, the University of the District of Columbia is offering a two-phase program for teachers, in conjunction with the presently functioning Science and Engineering Apprentice Program for High School Students.

We know that the high school science teacher serves as a center of influence to encourage young people to take more interest in science, and can help to identify students who have the attributes suitable for such careers at the earliest possible time. We would also hope that your experience would enable you to act as catalyst in the process of strengthening the teaching of science in our schools.

The first phase of this program consists of a three credit graduate level, concentrated course which could be used toward meeting re-certification requirements. This course, entitled "New Technology in the Science Classroom for Teachers", covers such topics as new advances in chemistry and physics theories, teaching methods, instrumentation, technology and psychological motivation methods. We expect to include visits to local Department of Defense laboratories for lectures on specific topics and possible laboratory experience.

During the second phase of this program, those teachers who successfully complete the spring semester program may be selected to participate in a summer institute consisting of eight weeks of on-site laboratory research experience in a DoD laboratory. Research results will be presented at seminar sessions at the University and three additional graduate credits may be obtained. These teachers will act as counselors for the students placed in the same laboratories.

SUMMARY

Phase 1.....Selected Saturday sessions between November 9, 1985 and March 1, 1986

- Teacher participant will attend class at the University of the District of Columbia,
- Class will usually be held 9 a.m. until 4 p.m. on

Saturdays.

- All University fees, including registration and books will be paid for by the Department of Defense.
- Visits to DoD laboratories for lecture and laboratory may be held on some weekdays if suitable release time can be obtained

Phase 2.....June 23, 1986-August 15, 1986

- Teacher participant will, if selected, perform active research in a local DoD laboratory.
- Teacher will counsel students & attend weekly seminars at the laboratory in which he is placed.
- Three additional graduate credits will be given for the summer activity.
- Research results will be presented in a seminar session at the University on August 15, 1986.
- All University fees, including registration, will be paid by DoD.
- Each participant will receive an educational support stipend of $350-per week for each of the eight weeks during the summer.

If you are interested in this program and feel that you qualify, please return the enclosed application by October 30, 1985.

Sincerely,

Marylin Krupsaw

Marylin Krupsaw
Center for Applied Research
Bldg 48
University of D.C.
4200 Connecticut Ave., N.W.
Washington, D.C. 20009

Participation in Phase 1 of the program during the spring does not automatically guarantee a position during the summer. Participating teachers will be required to take an exam and only those who qualify and are selected by a scientist will be accepted in Phase 2.

APPLICATION
FOR UDC/DOD SPONSORED COURSE

0303-537 NEW TECHNOLOGY IN THE SCIENCE CLASSROOM FOR TEACHERS
(3 Graduate Credits)

1. Name (type or print)
Mr. Ms. Dr. or_( )_____
last first initial

---

2. School Where Employed _____
name of school

_____
county

_____
city state zip code

Phone: _____
area code number

3. Residence_____
number & street

_____
city state zip code

Phone: _____
area code number

---

4. ☐ Male ☐ Female

5. Year of Birth_____

6. Social Security Number
_____

---

7. Are You: _____
Asian-American White Black Hispanic Other (specify)
(The information requested on race is not required. Your answer is strictly VOLUNTARY.)

---

8. Number of Years Teaching Experience: _____
high school jr.h.s. other

9. Highest Degree Earned: ☐ No degree ☐ Bachelor's ☐ Master's ☐ Doctorate ☐ Other (specify)_____

---

10. Bachelor's Degree_____ _____ _____
institution year major field

---

11. Highest Degree Beyond Bachelor's _____

_____ _____ _____
institution year major field

---

12. Citizen of _____(You must be a U.S. citizen)

---

13. List continuing education programs specifically for science faculty that you have attended within the past five years.

APPLICATION
FOR UDC/DOD SPONSORED COURSE

Name of Host Institution	Type of Program, e.g. Courses, Research, etc.	Year

14. I have most recently taught the following subjects:

_____

_____

_____

I plan to teach the following subjects in the near future

_____

_____

_____

15. State briefly, in terms of your future plans, your reasons for wishing to participate.

_____

_____

_____

_____

_____

16. Principal's Recommendation

☐ Recommended Highly ☐ Recommended ☐ Not Recommended

Principal's Signature: _____

17. _____ _____
Applicant's Signature Date

Send application to:

M. Krupsaw
Center for Applied Research
U.D.C. Bldg. 46/510
4200 Connecticut Ave. N.W.
Washington, D.C. 20008
University Phone-(202)-282-745

DEADLINE

December 30, 1985

SUBMIT WITH COMPLETE RESUME, INCLUDING ALL HONORS, PUBLICATIONS, ETC.

University of the
District of Columbia

VAN NESS CAMPUS
4200 CONNECTICUT AVENUE, N.W.
WASHINGTON, D.C. 20008

Center for Applied Research
Telephone (202) 282-3156

July 7, 1986

Dear Parents:

Your junior high school child has been selected to participate in a career broadening experience in science. The enclosed overview of the STARS program will further explain the objectives and mechanism of this experimental endeavor.

This next session of STARS will take place on the 22nd, 23rd and 24th of July, 1986 at the Maritime Institute of Technology and Graduate School in Linthicum, Maryland. We have enclosed a map showing the location that provides a local phone number, a phone number at the Institute, and a previous of schedule of events

In order to share this experience more fully, we would like you to attend an orientation session for parents and students to be held this coming Thursday, July 17th in room A03, Building 44 of the University of the District of Columbia, Van Ness campus. We will like to start promptly at 5:30 p.m so that we will be through before 6:30. At this time we will distribute parental permission forms that must be signed by a parent before the student may participate. Without your presence, your child will not be able to join us. You will have an opportunity to meet the people who will be with your child, to learn about the facility they will be visiting, and to ask any questions or voice any concerns you may have. If there is a problem, please call Mary Phillips at 282-3156.

A map of the Van Ness campus is enclosed indicating the position of Building 44. The Van Ness campus is a stop on Metro's Red Line and some complimentary parking may be provided in the University's parking garage.

Looking forward to seeing you at that time.

Marylin Krupsaw

Marylin Krupsaw
Project STARS

University of the District of Columbia

Center for Applied Research and Urban Policy
4200 Connecticut Avenue, N.W.
Washington, D.C. 20008

APPLICATION
UDC/DOD SPONSORED
STARS PROGRAM

1. Name (type or print)

_____
last first initial

---

2. School

_____
name of school

3. Residence

_____
number & street

_____
city state zip code

Phone: _____
area code number

---

4. / / Male 5. Year of Birth_____ 6. Social Security Number

/ / Female _____

---

5. Are You: _____
Asian-American White Black Hispanic Other (specify)
(The information requested on race is not required. Your answer is strictly VOLUNTARY.)

---

6. School Grade: _____

---

7. Citizen of _____(You must be a U.S. citizen)

---

8. List school or outside projects or activities specifically in science that you have enjoyed within the past year.

_____

_____

_____

APPLICATION
FOR UDC/DOD SPONSORED COURSE

9. State briefly, in terms of your future plans, your reasons for wishing to participate.

_____

_____

_____

_____

10. Teacher's or Counselor's Recommendation

/ / Recommended Highly / / Recommended / / Not Recommended

Recommender's Signature: _____

11. _____ _____
Applicant's Signature Date

Send application to:

DEADLINE

July 17, 1986

M. Krupsaw
Center for Applied Research
U.D.C. Bldg. 48/510
4200 Connecticut Ave. N.W.
Washington, D.C. 20008
University Phone-(202)-282-3156

APPENDIX C
SUPPORTING INFORMATION (SEAP)

University of the District of Columbia

Center for Applied Research and Urban Policy
4200 Connecticut Avenue, N.W.
Washington, D.C. 20008

Telephone (202) 282-7456

1 9 8 6
DEPARTMENT OF DEFENSE
SCIENCE AND ENGINEERING APPRENTICE PROGRAM
APPRENTICE QUESTIONNAIRE

N=279

A LOT %	SOME %	NOT RELEVANT TO MY PROJECT %	
			1. To which of the following were you exposed during your summer research project? Check those appropriate.
49.7	26.6	23.7	1. Philosophy of research
42.1	37.3	20.6	2. Use of the scientific method to solve problems
36.2	40.0	23.8	3. Use of experimental checks and controls
65.9	30.1	4.0	4. Measurement techniques
42.0	22.7	35.3	5. Process of functional design of equipment
21.2	34.5	44.3	6. Calibration of reagents, standards, and instruments
33.1	36.4	30.5	7. Process of design of an experiment
67.5	20.0	12.5	8. Data analysis (with or without computer assistance)
39.8	48.1	24.7	9. Computer programming
23.1	45.0	31.9	10. New computer language
43.0	39.5	17.5	11. Acquisition and use of scientific literature (books, audio visuals, etc.)
31.0	29.5	39.5	12. Identification of new questions as a consequence of scientific exploration
41.9	54.1	4.0	13. Teamwork in scientific research
14.8	31.4	53.8	14. Use of advanced scientific equipment
39.2	45.0	15.8	15. Other students with similar interests and goals
41.0	42.1	15.9	16. Scientists working in different areas of research
52.3	32.6	15.1	17. Information on scientific careers

Note: Answers given in % do not necessarily add up to 100% because of exclusion of "no response" answers, and rounding.

A LOT %	SOME %	A LITTLE %	NONE %		
				II.	Has your experience as a participant in this program contributed to your personal development?
27.3	12.3	29.6	14.2	1.	Working with peers
29.0	68.9	2.1	___	2.	Working with adults
29.3	57.6	12.1	1.0	3.	Job responsibility
33.2	48.1	15.0	3.7	4.	Better understanding of scientific principles
37.8	40.0	19.0	3.2	5.	Scientific vocabulary
26.0	40.2	30.5	3.3	6.	Ideas you can investigate further at the end of the program
39.2	45.4	12.1	3.3	7.	Better understanding of your interests and abilities
46.4	28.2	24.3	1.1	8.	Educational goal setting
33.9	38.9	16.1	11.1	9.	Insights into career opportunities in science
40.3	20.4	33.0	5.3	10.	Career goal setting
				III.	To what extent did you benefit from the following?
19.0	23.0	32.1	22.9	1.	Planned lectures or seminars
73.0	14.0	7.9	1.1	2.	Explanations of the work by mentor
20.4	35.6	34.2	8.8	3.	Tours of the laboratories
63.4	25.6	3.1	1.9	4.	Informal talks with the mentor
34.0	35.9	14.1	10.0	5.	Formal sessions with the mentor
19.4	34.6	21.7	16.3	6.	Advice from the program coordinator
				IV.	Satisfaction with the research apprentice experience?
83.1	15.9	2.0	___	1.	I enjoyed the experience.
67.2	22.9	2.0	___	2.	I like scientific research.
62.1	23.9	10.4	1.6	3.	I was satisfied with the way the mentor used my time.
56.7	4.3	16.0	12.0	4.	I would want to return to the same mentor next year.
				4b.	If not, check one of the following reasons:

Personality Conflict ___ Lack of interest ___ Want a different experience ___

Different location ___

V. Please answer these additional questions.

1. What did you like most about the program?

2. What did you like least about the program.

3. What did you do to keep busy during "down time" (when the equipment broke, the computer crashed, your mentor was absent,etc.)?

4. Did you and your counselor have any conferences?

DO NOT SIGN

PLEASE RETURN TO YOUR AGENCY REPRESENTATIVE

A.F.I.P.	Ms. Debbie Montgomery
A.R.I.	Ms. Janice Watts
B.R.D.E.C.	Ms. Joyce Burwell
D.R.L.	Mr. George Klem
C.R.D.E.C.	Mr. Robert Gavlinski
D.T.N.S.R.&D.	Ms. Jill Priest
E.T.L.	Ms. Beulah De Shields
Ft. DETRICKMs. Pa	Ms. Pat Schaefer
H.D.L.	Mr. Jeff Newman
N.M.R.I.	Dr. Michael Ackerman
N.R.L.	Ms. Nancy Lowry
N.S.W.C.	Ms. Dorothy Seabolt
N.V.E.O.L.	Ms. Mikki Collins
U.S.N.O.	Ms. Laura Charon
U.S.N.A.	Ms. Noreen Rice
U.S.U.H.S.	Dr. David Forman
W.R.A.I.R.	Dr. James McNeil
M.I.C.O.M.	
Redstone	Dr. Katie Blanding

University of the District of Columbia

Center for Applied Research and Urban Policy
4200 Connecticut Avenue, N.W.
Washington, D.C. 20008

Telephone (202) 282-7456

1 9 8 6

DEPARTMENT OF DEFENSE
SCIENCE AND ENGINEERING APPRENTICE PROGRAM
MENTOR EVALUATION FORM

N=173

1. How clearly did you understand the educational intent of the program?

A lot 76.3 Some 23.2 Not at all .06

2. Did you volunteer to be a mentor?

Yes 97.8 No 2.2

3. Did the student application provide sufficient information?

Yes 94.3 No 5.7

4. If no, what additional information would you want to include on the student application form?

_____

_____

5. Did you interview the student who was placed in your laboratory before the program started?

Yes 58.2 No 48.8

6. If no, would an interview have been useful?

Yes 67.1 No 32.9

7. In your opinion
How much has the student's work in your laboratory contributed to his/her understanding of the nature of scientific research?

A lot 72.0 Some 26.9 Not at all 1.1

8. How much did the student contribute to the research of your laboratory?

A lot 65.7 Some 31.5 Not at all 2.8

9. How would you rate the student's performance?

More than I expected 65.7 About what I expected 33.1 Less than I expected 1.1

10. Would you want the same student in your laboratory next summer?

Yes 87.7 No 12.3

Please include additional suggestions or comments on the program, as we sincerely appreciate your input.

Name of Student

Signature of Mentor

PLEASE RETURN TO YOUR AGENCY REPRESENTATIVE

A.F.I.P.	Ms. Debbie Montgomery
A.R.I.	Ms. Janice Watts
B.R.D.E.C.	Ms. Joyce Burwell
B.R.L.	Mr. George Klem
C.R.D.E.C.	Mr. Robert Gavlinski
D.T.N.S.R.&D.	Ms. Jill Priest
E.T.L.	Ms. Beulah De Shields
Ft. DETRICKMs. Pa	Ms. Pat Schaefer
H.D.L.	Mr. Jeff Newman
N.M.R.I.	Dr. Michael Ackerman
N.R.L.	Ms. Nancy Lowry
N.S.W.C.	Ms. Dorothy Seabolt
N.V.E.O.L.	Ms. Mikki Collins
U.S.N.O.	Ms. Laura Charon
U.S.N.A.	Ms. Noreen Rice
U.S.U.H.S.	Dr. David Forman
W.R.A.I.R.	Dr. James McNeil
M.I.C.O.M. Redstone	Dr. Katie Blanding

University of the District of Columbia

Center for Applied Research and Urban Policy
4200 Connecticut Avenue, N.W.
Washington, D.C. 20008

Telephone (202) 282-7456

D O D
SCIENCE AND ENGINEERING APPRENTICE PROGRAM
Time Line
NAVY RESEARCH CENTER
Calendar

		Dates
1.	Mentor Orientation:	24 February 1986
2.	Review Applications by:	14 March 1986
3.	Interview applicants by:	30 March 1986
4.	Mentor notify student you selected as soon as possible after all interviews:	By 11 April 1986
5.	Mentor Notify Lab Coordinator of student selected by:	Before 14 April 1986
6.	Return Applications of students not selected to Lab Coordinator:	As soon as possible to permit student to have a chance somewhere else.
7.	Coordinators returns unselected applications. and copy of completed top sheet of application of each selected students:	By 18 April 1986
8.	Program Orientation:	23 June 1986 9:30 a.m.
9.	First day of work:	23 June 1986
10.	Weekly "Brown Bag" Seminars:	As scheduled
11.	First draft of final report:	9 August 1986
12.	Last day of work:	14 August 1986
13.	Program Final Session:	15 August 1986

University of the
District of Columbia

VAN NESS CAMPUS
4200 CONNECTICUT AVENUE, N.W.
WASHINGTON, D.C. 20008

CENTER FOR APPLIED RESEARCH 282-3156

Dear Student:

Congratulations! You have been selected to participate in the Department of Defense Summer Science and Engineering Program as an apprentice to

_____

at _____

_____

from June 23, to August 15, 1986.

Please complete and return the enclosed form in the self-addressed envelope by the end of the month.

The Apprentice Program provides an exciting opportunity for you and we hope you will take advantage of the work experience to learn more about scientific research, career opportunities in science and engineering, and education necessary to prepare yourself for such careers.

On June 23, 1986, the first day of the program, you are expected to attend an orientation session with other apprentices and their guests, agency representatives and mentors. The session will take place from 9:30 a.m. to noon in the main auditorium at the Van Ness Campus (see the attached map) of the University of the District of Columbia, 4200 Connecticut Avenue, NW, Building 46, Washington, DC. At that time you will be given guidelines for the summer and a chance to ask questions about any concerns you might have.

We hope you will enjoy your apprenticeship. I will be available throughout the summer should problems arise that cannot be solved by your mentor. I look forward to meeting you on June 23.

Sincerely,

Marylin Krupsaw, Director
Science and Engineering
Apprentice Program

University of the District of Columbia

VAN NESS CAMPUS
4200 CONNECTICUT AVENUE, N.W.
WASHINGTON, D.C. 20008

CENTER FOR APPLIED RESEARCH 282-3156

STUDENT ACCEPTANCE FORM

I, _____, hereby accept the position of apprentice in the DoD Science and Engineering Apprentice Program from June 23, 1986 to August 15, 1986 with _____ at _____ _____.

I understand that I will receive a stipend of at least $1,100 for the summer apprenticeship for which I must participate during the entire session, submit a written final report, and abide by all regulations of the host installation.

_____ _____
(Signature) (Date)

PARENTAL CONSENT

As the parent/guardian, I certify that my son/daughter/ward has my permission to participate in this project for secondary school students. It is my understanding that he/she will be subject to the regulations of the host installation and of the project. I understand that should a health emergency arise, I will be notified, but that, in the event I cannot be reached by telephone, such medical treatment as deemed necessary by competent medical personnel is authorized.

_____ _____
(Signature of Parent) (Date)

_____
(Daytime Phone)

University of the District of Columbia

Center for Applied Research and Urban Policy
4200 Connecticut Avenue, N.W.
Washington, D.C. 20008

Telephone (202) 282-7456

DEPARTMENT OF DEFENSE

SCIENCE AND ENGINEERING APPRENTICE PROGRAM
for High School Students

23 June 1986

ORIENTATION AGENDA

Greetings.....Prof. Marylin Krupsaw, UDC, Program Director

Welcome.....Mr. Claude Ford, Pres. Univ. of D. C.

Introduction of Guests.....Lin Krupsaw

From UDC

Dean Phillip Brach, College of Physical Science, Engineering & Technology
Dr. Vijaya Melnick, Director, Center for Applied Research & Urban Policy
Dr. Bobby Austin, Assistant to the President

From DoD

Mr. Albert M. Bottoms, Coordinator for all student science apprentice programs
Dr. Robert Sasmor, Acting Asst. Director, U.S. Army Laboratories
Dr. David Moran, Research Coordinator, David Taylor Naval Ship R & D Center

Keynote Speaker.....Captain James O'Donovan, USN, Commanding Officer Naval Research Laboratory

INTERMISSION
Regroup according to laboratory

Introduction of Laboratory Coordinators and Teacher/Counselors.....Lin Krupsaw

Question Period

Closing Remarks.....Lin Krupsaw

HAVE AN EXCITING SUMMER

OFFICE OF THE UNDER SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301-3000

RESEARCH AND ENGINEERING (R&AT)

APR 1986

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (RESEARCH, DEVELOPMENT AND ACQUISITION)
ASSISTANT SECRETARY OF THE NAVY (RESEARCH, ENGINEERING AND SYSTEMS)
ASSISTANT SECRETARY OF THE AIR FORCE (RESEARCH, DEVELOPMENT AND LOGISTICS)

SUBJECT: DoD Science and Engineering Apprenticeship Program for High School Students

DoD Instruction 3218.1 issued in August, 1981 formally established the DoD Science and Engineering Apprenticeship Program for High School Students. This program enables promising high school students to have research experiences, primarily during the summer months, in the 73 Service laboratories and with DoD university researchers. Almost 4,000 young people have participated in the program since its inception.

I would like to commend the Services for the outstanding job that has been done so far in creating opportunities to expose high school students to the excitement of defense research, and wish to ask your cooperation in insuring that this program continues to thrive over the next few years.

While the program is small in terms of the investment made by the Services, the long-term payoffs to the defense R&D community can be highly significant. DoD either employs directly or affects through its spending almost 20 percent of the scientists and engineers in the nation. At a time when it is increasingly difficult to attract and retain quality scientific and technical talent within the DoD R&D community and at a time when almost 60 percent of today's engineering Ph.D. recipients are foreign nationals, the Apprenticeship Program is playing an important role in encouraging larger numbers of American young people to study scientific and engineering disciplines important to the defense mission.

I would like the Apprenticeship Program to continue to enjoy the high visibility and support within the Department and the Administration which it has in the past, and was pleased to note that it was highlighted in Congressional testimony given recently by the President's Science Advisor. In anticipation of severe demands on resources expected in the future, I urge you to ensure that this program remains a top priority for continuing support.

(signed) Ronald L. Kerber

Ronald L. Kerber
Deputy Under Secretary of Defense

University of the
District of Columbia

VAN NESS CAMPUS
4200 CONNECTICUT AVENUE, N.W.
WASHINGTON, D.C. 20008

(202) 282-3156

Dear Summer Apprentice, June 1986

You particularly need to know about the following:

1. Program runs from June 23, 1986 to August 15, 1986. You are expected to be present & on time each working day.

2. Attendance at brown bag seminars, and the presentation of your final report are mandatory. Special exception for concurrent work accepted only with mentor's written permission.

3. You will present a formal Final Report on the last day of this D.O.D. program this summer. Your report will be typed and will follow the Standard Format.

4. You will keep the original copy of your Final Report.

5. You will make several xeroxes of your Final Report after it is signed by your mentor. Your mentor will get one copy, the university will get two copies, and every college you apply to for admission, loan, or scholarship help should also get a copy.

6. You are expected to work 8 hours/day. Any time missed from work must be reported to your mentor & your teacher/counselor. Make-up anytime missed in someway; lunchtime, come in early, take work home, etc. Such responsible conduct can only enhance your reputation when you later need to ask your mentor for a recommendation, for a job for next summer, or to ask the University to get you a job with more challenges.

7. Please give your parents/guardians in writing by the end of your first day the room number(s), the building number/name, the phone number(s), and the name(s) of mentor(s) you will be associated with where you are working. Those with whom you live at home should always be able to get hold of you in the event of an emergency.

8. You will see a number of job openings, where you are working, for next summer. You are encouraged to apply for these positions as summer intern/employee which you should be qualified to fill by the end of your first summer D.O.D. apprenticeship. When you accept different employment, your apprentice slot opens up for a new person. Besides, your new job usually pays more.

9. Your mentor will give you a fantastic technical education only if you ask for work, challenges, and responsibilities. You will learn from this opportunity in direct proportion to what you put into it.

NOTE: The program staff has the right to withhold the educational support stipend if any one of these conditions is not fulfilled.

Have a good summer!

University of the
District of Columbia

VAN NESS CAMPUS
4200 CONNECTICUT AVENUE, N.W.
WASHINGTON, D.C. 20008

FINAL REPORT FORMAT

The Department of Defense Science and Engineering Apprentice Program requires a final report on your summer's experience. You will need several copies of your written report and be prepared to make a short oral presentation at the University at the final session.

You can be preparing this as the summer progresses by keeping a log which includes a general description of the project, including your part in any ongoing research or data analysis; references you consulted; learning experiences, such as experimental design and techniques, instrumentation, computer languages and applications. Your report should include technical language and information suitable for any scientific presentation. Please don't forget to include acknowledgments and thanks to your mentor and others who helped you in the laboratory. You will, of course, want to thank these people personally before you leave, but it's nice to put it in writing too.

Your final report should illustrate the learning and technical experiences encountered during the summer. The quality of your report is of primary concern - quantity should be minimized. The report should conform to the following format:

1. Cover sheet
   your name, your high school, date
   laboratory, mentor's name and title of research

2. Abstract - a brief overview of the research project
   about 50 words, if possible. See handout on Abstracts

3. Introduction and acknowledgments
   Rationale - Explain the purpose of the research. Give
   concrete examples of the usefulness of the research.

4. Body (use sub-headings as appropriate)
   We suggest a minimum of five pages, exclusive of appendix
   List experimental equipment used, procedure, and results
   including new discoveries, data, and analyzed data

5. Conclusion's,

6. Appendices

7. Bibliography

Your final report must have the approval and signature of your mentor on the cover sheet. No report will be accepted without your mentor's signature. Don't wait until the final week of the program to give your report to your mentor to read. You will spend sleepless nights making any corrections needed in order to get the report in to the laboratory and the university on time.

* No final stipend check will be given without receipt of the final report.

The program requires three copies of your report; one copy for your mentor, one for the teacher who acts as your counselor, and one for the program director. You will want several copies for yourself to submit with college applications as examples of your work.

* All reports must be ready to be given to your counselor by Monday, 11 August 1986. Your final report must be delivered orally at the University of the District of Columbia on Friday, 15 August 1986.

ABSTRACT

Final Format

Your abstract is to be a brief summary of your research project(s). At best, your abstract will be an overview of the experiment(s) that you worked on. At worst, your abstract will be a list of your work experiences and the skills that you acquired during your apprenticeship.

The length of your abstract should be approximately 10-50 words.

Your abstract should be written in the third person. Avoid pronouns such as "I," "my," and "our."

The abstract should contain all major key words that would identify the nature of your project. Some examples are: Chi-Square distribution, CAI, VAX, FORTRAN, perception, key-word search, voice response and voice synthesis, and specific heat.

Your abstract would NOT contain any clauses such as: "This summer as an apprentice," "A unique and unforgettable experience," "I enjoyed the work," "During my summer internship," "I worked at the Army Research Institute for Social and Behavorial Science," "I worked with Dr. Jones and Ms. Smith," "This work was important to me because...", and "The purpose of this project was to find out if..."

Some examples of good abstracts are:

Worked in electron microscopy, plasma etching, and designing, fabricating, and evaluating a target for ion beams.

In magnetic fields, the Hall voltages of semi-conductors were measured in order to calculate from them the resistivity, Hall coefficient, mobility, and carrier concentration of the samples at different magnetic field strengths; thus, the usefulness of samples for photoconductive devices can be determined.

Apple Pascal, and CP/M Pascal were learned to translate the master BEES program so that the entire package could be used by soldiers in the field; graphs were not available on the field computer, so graphs had to be replaced with equations by using regression analysis.

Designed an original computer program that would plot waveforms and even tutor the data imputer on how to use the program.

Tests were conducted using stress relaxation in conjunction with oven ageing to determine hydrolytic stability of elastomers.

Camouflage materials were engineered and tested so as to be non-detectable to both infrared and radar.

Did perception analysis to answer questions about the enlistment motivations and demographics of new army recruits.

University of the District of Columbia

Center for Applied Research and Urban Policy
4200 Connecticut Avenue, N.W.
Washington, D.C. 20008

Telephone (202) 282-7456

DEPARTMENT OF DEFENSE
SCIENCE & ENGINEERING APPRENTICE PROGRAM

1986 Closing Ceremonies

Greetings.....Prof. Marylin Krupsaw
Director, SEAP

Welcome.....Dr. Vijaya Melnick,
U.D.C., C.A.R.U.P.

Introductions.....Lin Krupsaw

Dr. Hamed M. El Bisi, Associate Director, Army Research and Technology

Dr. Leo Young, Director, Research & Laboratory Mgt., Office of the UnderSecretary of Defense for Research & Eng.

Keynote Speaker.....LGEN James A. Abrahamson
Office of the Secretary of Defense
Director, Strategic Defense Initiative

Closing Remarks.....Lin Krupsaw

Seminar Sessions will be held in Building 41, 3rd and 4th floors. Please see seminar schedule for your assignment.

SEAP checkout procedures will be conducted by your teacher/counselor in the Bldg. 41, 4th floor foyer.

University of the
District of Columbia

VAN NESS CAMPUS
4200 CONNECTICUT AVENUE, N.W.
WASHINGTON, D.C. 20008

The University of the District of Columbia

cordially invites you

to attend the Final Session

of the participants

in the

Department of Defense sponsored

SCIENCE AND ENGINEERING APPRENTICE PROGRAM

at which time

the high school students will make presentations

of the work

in which they were involved during the summer of 1986

15 August 1986
Fine Arts Auditorium, Building 46
Connecticut and Idaho Avenues, N.W.
Van Ness Campus
10:00 a.m.
Seminars in Building 41

ALL INTERESTED ARE INVITED

Keynote Speaker.....LGEN James A. Abrahamson,
O. S. D., Director,
Strategic Defense Initiative

DEPARTMENT OF DEFENSE
STRATEGIC DEFENSE INITIATIVE ORGANIZATION
WASHINGTON, DC 20301-7100

6 October 1986

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR RESEARCH AND ENGINEERING

SUBJECT: DoD Science and Engineering Apprenticeship Program for High School Students

I recently had the opportunity to address the students who participated this summer in the Joint Army-Navy Initiative of the National Capital Area DoD Science and Engineering Apprenticeship Program for High School Students. I wanted you to know how impressed I am with the program, the students, and the Department's role in developing such an outstanding initiative to expose young people to careers in scientific and technical fields.

I understand that DoD's Science and Engineering Apprenticeship Program for High School Students was begun in 1980 and has involved almost 5,000 young people since its inception. This past summer, some 600 students throughout the United States had research experiences in DoD laboratories or with university researchers under contract to DoD. The Joint Army-Navy Initiative in the National Capital Area involved some 450 students in 17 R&D laboratories ranging from the Walter Reed Army Institute of Research to the Naval Research Laboratory. The program in this area is highly competitive--almost 3,000 students competed for the 450 summer apprenticeships available in the Washington metropolitan area.

The students are matched with senior laboratory scientists and engineers who serve as mentors and guide the students' research. The Joint Army-Navy Initiative also provides a number of enrichment activities including field trips and seminars to expose the Apprentices to a wide variety of topics. The students also prepare papers describing their research projects which they present to their peers at the closing session. In past years, some students and mentors have jointly prepared research papers which were ultimately published.

As you are well aware, DoD draws heavily on the nation's scientific and technical community--almost 20 percent of scientists and engineers in the United States are either directly employed by DoD or are affected by DoD spending. DoD's Apprenticeship Program is an excellent mechanism for exposing young people to the excitement of hands-on research and potential careers in science and technology. The small amount of money spent by the Services for this program is a sound investment in the future, and I hope to see the program continue to thrive.

JAMES A. ABRAHAMSON
Lieutenant General, USAF
Director

cc: Secretary of the Army
Secretary of the Navy
Secretary of the Air Force

SEAP Checkout:

1. Turn in two (2) copies of your Final Report to your teacher/counselor

2. Turn in your program evaluation to your laboratory coordinator (as listed on the back of the evaluation form)

3. Remind your mentor to turn in the mentor evaluation to the laboratory coordinator

4. Turn in a copy of your final report to your coordinator, mentor, and anyone else who was of significant help during your summer apprenticeship

5. Turn in your badge and your car pass either on your last day of work, as you leave, or at the University - as instructed

6. Attend the final session on August 15, 1986 in the auditorium, Bldg 46, UDC - Van Ness Campus promptly at 10 a.m. Be prepared to present a brief overview of your Final Report

7. Collect your educational support stipend after everyone in your group has finished presenting his Final Report

APPENDIX D
SUPPORTING INFORMATION (TNT)

UNIVERSITY OF THE DISTRICT OF COLUMBIA
DIVISION OF CONTINUING EDUCATION

COURSE SYLLABUS
Spring 1986

COURSE NUMBER/TITLE/CREDITS

0303-537 New Technology in Science for Teachers 3 Credits

COURSE DESCRIPTION:

This course is designed to provide high school science teachers an awareness of recent changes in chemistry and physics curricula as they pertain to public school science courses. Basic principles, properties and laws of electromagnetic radiation and sound and transmission of electromagnetic radiation and other wave phenomena through a vacuum and supporting media will be discussed. Laboratory experiments will be performed to provide hands-on experience with instruments used in studying the basic principles addressed in the course. Field trips to area research laboratories will be scheduled.

PREREQUISITE:

Current science teaching position in an area high school.

TEXTBOOKS/REFERENCES: Although most of the materials covered in the course will be given to the students as handouts, the following reference texts are recommended for more in-depth study.

1. Analytical Chemistry, 4th Edition, by Douglas A. Skoog and Donald M. West; Saunders College Publishing.

2. Principles of Instrumental Analysis, 3rd Edition, by Douglas A. Skoog; Saunders College Publishing.

3. Chemistry Experiments for Instrumental Methods, 1st Edition, by Donald T. Sawyer, William R. Heineman, and Janice M. Beebe; John Wiley and Sons.

4. Modern Practices in Infrared Spectroscopy: Laboratory Manual, by K. E. Stine; Beckman Instruments, Inc.

5. University Physics, 4th Edition, by Arthur Beiser; Benjamin/Cummings Publishing Company, Inc.

6. University Physics, 6th Edition, by Sears, Zemansky and Young; Addision Wesley, Inc.

INSTRUCTION PROCEDURE

Student will be divided into two groups that will rotate through the physics and chemistry portions of the course, alternately. The morning sessions of the course will consist of lectures. The students will perform laboratory experiments during the afternoon session.

INSTRUCTORS

Physics.	Dr. Anthony Donfor	Chemistry.	Dr. Hershel McDowell
	Dr. H.V. Eagleson		Dr. Julius Mack
	Dr. John Fortna		Mr. Charles Ester
	Dr. Robert Kasten		

GRADING: Each student is required to write a report on each laboratory experiment performed. The grade awarded in the course will be based on the quality of the reports submitted by the student.

COURSE OUTLINE

I. Chemistry

WEEK	TOPIC	EXPERIMENT(S)
1	Properties of Electomagentic Radiation a. Wave Properties of Electromagnetic Radiation b. Particular Properties of Electromagentic Radiation c. The Electromagnetic Spectrum d. The Generation of Electromagnetic Radiation e. The Absorption of Electromagnetic Radiation f. Quantitative Absorption Measurements (Beer's Law) g. Terminology Associated With Absorption Measurments h. The Absorption Process (Spectral Curves) - Atomic Absorption Spectra - Molecular Absorption Spectra --- Infrared and Microwave (Regions) --- Ultraviolet and Visible (Regions)	Sample preparation and Survey of Different Instruments (operation)
2	Instrument Components and Instruments for the Measurements of Absorption a. Ultraviolet and Visible Spectrophotometers b. Infrared Spectrophotometers c. Treatment of Data	Operation and Response of Spectrophotometers a. Preparations of Absorption Spectra b. Preparation of Standard Curves c. Quantitative Analysis of Unknown Samples and Sample Mixtures (Each experiment will be performed using the following instruments: 1. Spectronic 20 2. Beckman DU-2 3. Cary 14 4. Hitachi Model 220 Students may arrange work in the laboratory on weekdays.)
3	Infrared Spectroscopy a. Sample Preparation - Nyjol - Solvent - KBr Pellet - Neat	-- Preparation of I.R. Spectra Identification of Unknown Compounds

b. Analysis of Spectra
   a. Quantitative Analysis
   b. Qualitative Analysis

4 Astronomy

Completion of Unfinished Experiments

II. Physics (Lecture and Laboratory)

5 A. Measurements Using:
   a. Meter Stick
   b. Vernier Caliper
   c. Micrometer

B. Identification of Metals by Density Measurements

6 Sound

A. Determination of the Velocity of Sound in Metal Rods

B. Determination of the Speed of Sound in Air by Resonance Tube Method.

7 A. Making of a Musical Scale from Calculated Sections of a Metal Rod.

B. Investigation of the Vibration of Strings Using a Sonometer; Mersenne's Law.

C. Verification of Hooke's Law using a Spring-Mass System.

8 A. Determination of the Period of a Simple Pendulum.

B. Time and Frequency Measurements Using an Oscilloscope.

DEPARTMENT OF DEFENSE

HIGH SCHOOL SCIENCE TEACHER PROGRAM

BY

THE UNIVERSITY OF THE DISTRICT OF COLUMBIA

6:00 - 6:30.....Social Hour

6:30 - 6:35.....Welcome
Lin Krupsaw, UDC

6:35 - 6:40.....Invocation
Dr. Anthony Donfor, UDC

6:40 - 7:40.....Dinner

7:40 - 7:50.....Introduction of Guest Speaker
Arthur H. Sass, NRL

7:50 - 8:40.....Guest Speaker
James E. Spates, Director,
U. S. Army Laboratories

8:40 - 8:45.....Presentation of Special Award
Dr. Philip Brach, UDC

8:45 - 8:55.....Presentation of Certificates

8:55 - 9:00.....Closing Remarks
Lin Krupsaw, UDC

University of the
District of Columbia

VAN NESS CAMPUS
4200 CONNECTICUT AVENUE, N.W.
WASHINGTON, D.C. 20008

25 April 1986

TO: Particpants of '86 HI-TEACH

RE: Final Field Trip of the Semester

As you know, field trips to participating laboratories were an integral part of the course, "NEW TECHNOLOGY IN THE SCIENCE CLASSROOM". In order to receive any grade other than an "I" signifying Incomplete for this course, it is necessary that all participants attend field trips, with or without students. Several teachers were not present at the Naval Research Laboratory on 16 April 1986. Please be advised that it is truly necessary for you to join us at the Harry Diamond Laboratory on 9 May 1986.

The teacher banquet will be held on Friday evening, 16 May at the Officers' Club, U. S. Navy Yard, Washington, D.C. At this time, grades, assignments, certificates, etc. will be distributed. If you have not already done so, please send your check in the amount of $10- per person to

Arthur H. Sass, Employee Development Division
Naval Research Laboratory, Code 1840
Washington, D. C. 20375

or plan to have your payment with you on 9 May 1986. We would also like to collect your course evaluation form at that time, or at the banquet.

HARRY DIAMOND LABORATORY
2800 Powder Mill Road
Adelphi, Maryland 20783

9 May 1986 : 12:30 - 3:30 p.m.

The laboratory is located a few blocks off the New Hampshire Ave. exit of the Beltway, 495. Exit New Hampshire Ave. North (toward White Oak). At the first intersection, (Powder Mill Road) turn right. At the light, turn left. Entrance is on your left. We will meet at the security desk to obtain visitors' badges.

The tour will include a little of the flavor of the work at Harry Diamond - from a demonstration of a portable generator used in the field to an explanation of some of the electronics used in modern equipment. We will be touring Aurora, whuich uses x-rays to simulate gamma rays so that researchers can test the effects of simulated nuclear radiation on equipment. Aurora enables some systems to be

University of the District of Columbia

4200 Connecticut Avenue, N.W.
Washington, D.C. 20008

"PROJECT STARS" PROGRAM REPORT OVERVIEW

The "Project STARS" Program (Science Technology and Research for Students) initiated for bright junior high school students was sponsored by the Department of Defense and administered by the University of the District of Columbia.

For the period May 14 through May 16, 1985, 35 junior high school students attended three days of science career influencing at the Maritime Institute of Technology and Graduate Studies (MITAGS) in Linthicum, Maryland. These students came from 21 different schools in the District of Columbia.

During their stay at MITAGS, the students were taught by the MITAGS personnel and the other staff to use the computers and library research facilities and were given demonstrations of five computer simulation areas in MITAGS including ship handling, radar identification, liquid fuel cargo control, engine room operations, and cryogenic facilities and experienced the same type of problems and classroom work that the ship's masters and mates are required to accomplish for promotion and renewal of licensing. The students were also given lecture/demonstrations by scientists who explained facets of their specific career fields, areas of research, types of academic preparation necessary, and future prospects. Since several of these scientists were products of many of the same schools the students attend in D.C., the effect was truly inspiring.

The enthusiastic response of these students back in their classrooms, their written evaluations, the pre and post test scores, and the overwhelmingly positive reaction on the part of all adults involved have resulted in another such seminar being planned this fall. The funding that had been written into the original SEAP grant will be able to cover the second session due to the fact that everyone involved contributed to this venture without compensation. Also each lecturer and scientist who volunteered his time has already agreed to join us again in this worthwhile endeavor in July.

As a follow up of the "Project STARS" program, these students may be eligible to attend Saturday and summer sessions of UDC's "YES" Program (Youth in Engineering and Science) and the Saturday Academy, and may be invited to attend one of the regularly scheduled seminars at NRL (Naval Research Laboratory) during the summer SEAP program to join our high school students at the lab for an afternoon.

Overall, the main objective and purpose of the program is that of encouraging bright students, with an emphasis on women and minorities, to seek careers in the field of science and engineering. We hope that these knowledge-enriching programs will present the technological possibilities the future holds for bright, young, educationally striving students.

tested at a fraction of the cost of staging an underground nuclear test.

ALL GUESTS MUST BE UNITED STATES CITIZENS. Each person attending must have a picture identification card of some kind (driver's license or school ID) and must be wearing flat shoes to prevent a possible accident during the tour.

An ALPHABETIZED list of all attendees, indicating whether teacher or student, must be received by this office by Monday, 5 May 1986. Please call 282-3156 and check with Lin or Mary for receipt of your list. The total compilation of all visitors must be dropped off at Harry Diamond Laboratory on Monday afternoon. Send lists to

Lin Krupsaw
CARUP 48/510
University of the District of Columbia
4200 Connecticut Ave. N. W.
Washington, D. C. 20008

We are LIMITED IN NUMBER to a total of 50 visitors.

Sincerely,

Lin Krupsaw

APPENDIX E
SUPPORTING INFORMATION (STARS)

University of the District of Columbia

Center for Applied Research and Urban Policy
4200 Connecticut Avenue, N.W.
Washington, D.C. 20008

Telephone (202) 282-7456

SCIENCE, TECHNOLOGY AND RESEARCH STUDENTS
"S * T * A * R * S"

ORIENTATION

17 July 1986

Building 41, Room A-04

Welcome .....Dr. Jerome S. Paige
Center, Applied Research

Greetings ..... Lin Krupsaw, STARS
Director

Program Overview ..... Lin Krupsaw, STARS
Director

Showing of Film of Maritime Institute

Information About the Program ..... Lin Krupsaw, STARS
Director

Introduction of Participating Counselors and Teachers

Question and Answer Period

Maritime Institute of Technology
Hammonds Ferry Road
Linthicum, Maryland
(301) 859-5700

University of the District of Columbia

Center for Applied Research and Urban Policy
4200 Connecticut Avenue, N.W.
Washington, D.C. 20008
Telephone (202) 282-3156
Telephone (202) 282-7456

July 7, 1986

Parental Consent:

As the parent/guardian of _____,
I certify that he/she has my permission to participate in the "STARS" Program at the Maritime Institute of Technology and Graduate Studies in Linthicum, Maryland, July 22, 23, & 24, 1986.

It is my understanding that he/she will be subject to the regulations of the host institution and of the project. I understand that should a health emergency arise, I will be notified, but that, in the event I cannot be reached by telephone, such medical treatment as deemed necessary by competent medical personnel is authorized.

_____ _____
(Date) (Signature of Parent/Guardian)

Daytime Phone _____

LECTURE FOR STARS PROGRAM, JULY 1986

Today I am going to speak to you on the subject of Space Science. I am a member of the Space Science Division of the Naval Research Laboratory, where I have been since I finished school at the University of Illinois in 1964. I first became interested in space science when I was about 10 years old; it came about as a result of reading Buck Rogers science fiction comic books and also from reading about the factual science of astronomy in one of my father's textbooks.

Space science includes a wide range of activity, and in fact most of the main fields of science, including biology, have space science aspects. Today I will be speaking mainly about space astronomy, that is the study of objects outside the Earth from space vehicles. However, space science also involves looking back at the Earth (SLIDE 1)- we can gain new information about the Earth by looking back at it from space, and we can then consider the Earth to be just one of the nine planets in the solar system which we include in space science studies.

Our solar system (SLIDE 2) consists of the Sun and nine major planets, plus many satellites of the planets, and other smaller objects. Since the 1960's, the development of rockets and space vehicles has allowed us to explore the other planets close-up instead of just observing them with large telescopes on the ground (SLIDES 3,4).

However, another major advantage of space astronomy compared to ground based astronomy has nothing to do with getting closer to what we are looking at, but just with getting outside the Earth's atmosphere. We generally think of the Earth's atmosphere as being transparent, because visible light from the Sun and stars gets through to the ground fairly easily. However, there are other forms of light which are not visible to the human eye, known as the ultraviolet and the infrared, which do not get through the Earth's atmosphere as well (SLIDE 5). These other forms of light give scientists much new information about other planets, the Sun, and stars- such as what kinds of material they are made of- which we can't obtain with ordinary visible light.

The Naval Research Lab has been working in the area of space astronomy since the late 1940's, in fact I first read about NRL in library books while I was still in high school. The first form of rocket vehicle which was used to carry scientific instruments above the atmosphere was the sounding rocket, and it is still very much in use today in spite of the availability of satellites and the space shuttle. A sounding rocket is relatively small compared to the rockets used to launch satellites and planetary missions, and it stays above the atmosphere only a few minutes before returning to Earth. (SLIDES 6,7,8). SLIDE 9 shows the kind of new information we can get by looking at stars in the ultraviolet. We recently used sounding rockets to observe Comet Halley in ultraviolet light (SLIDES 10,11).

However we also have been involved in some of the "bigger" NASA space missions. We had an ultraviolet camera on the Apollo 16 mission which went to the Moon in 1972 (SLIDE 12) and one of the things it did was to look back at the Earth in ultraviolet light (SLIDE 13); it was able to see the hydrogen gas which makes up the outermost atmosphere (and because it is very light compared to oxygen and nitrogen it extends to much greater altitudes). NRL also had

experiments on the Skylab space station in 1973 and 1974 (SLIDE 14). The experiments made observations of the Sun in ultraviolet light (SLIDE 15) which provided new information about the outer atmosphere of the Sun which could not be obtained with visible light.

NRL also has been much involved with experiments carried into space on the Space Shuttle (SLIDE 16). Two NRL scientists were trained as astronauts to fly on the Spacelab 2 mission in July, 1985 which also carried NRL experiments to look at the Sun in ultraviolet light (SLIDES 17,18,19). NRL X-ray astronomy group developed an instrument known as Spartan which flew on the shuttle in June, 1985 (SLIDES 20,21,22,23). My own group has two projects which are planned for shuttle flights (SLIDES 24,25).

I would also mention that space science does not just involve building new instruments, flying them, and getting back pretty pictures. We have to analyze the results using mathematics and computers in order to obtain the final information we are seeking (SLIDES 26,27).

For those of you who are interested in eventually working in space science, I recommend that you get a strong basic education in science and mathematics early in high school. Mathematics and the basic sciences (physics, chemistry, and biology) are essential to almost all fields of science and technology and you should do your best in these courses. Also, you should try to participate in science related activities such as science fairs, and summer job opportunities such as the Science and Engineering Apprentice Program.

A CAREER IN ENTOMOLOGY

Entomologists are professional scientists that are concerned with the study of insects, insect environments, and the effects of insects on people and on their surroundings. Some Entomologists are involved with reducing or eliminating harmful species of insects that destroy food, housing, and clothing, and cause discomfort to humans, pets, and livestock.

Some other Entomologists are developing methods to increase the growth of beneficial insects. Some examples of beneficial insects are: bees, which pollinate crops, and make honey. Some other examples are: praying mantists and ladybugs, which destroy insect pests.

I have been interested in the career of entomology since I was about 6 years old. I became interested in entomology when I first went to the Insect Zoo located in the Smithsonian Institute located in Washington, D.C.. Bruce, a person working there, gave me a monarch butterfly caterpillar. Monarch butterflies are orange butterflies with black veins on their wings. Their caterpillar is one with black, yellow, and white stripes. Unfortunately, the caterpillar got stepped on and died. So,my father and I looked for some more caterpillars. We found some more on milkweed, the plant on which they feed. That was when I started raising butterflies.

I really started raising monarch butterflies when I was 6 years old. I was raising monarchs, and when I got 20 to 30 hatchings I brought them to the Aquatic Gardens to release them. Some days I released 40 to 50 or sometimes 60 or more of them.

I was also on a TV program, produced by channel 7, on insects. It was never shown .

The educational requirements for being an Entomologist are a B.S. and it is recommended to have a master's or a PH.D. You need to take courses in math, English, and physical and biological sciences.

Employment opportunities for Entomologists with a bachelor degree are limited, but prospects for those with a master's or Ph.D. degree are good. Currently there are more job openings than graduates. In addition to new opportunities, some Entomologists will be needed to replace present workers who will leave the profession for various

reasons.

The salaries for an Entomologists depend on background, experience, and responsibilities of the individual. In colleges and universities, earnings range from about $24,000 for beginning instructors to over $50,000 for full professors. The Federal government hires beginners ,with a B.S.,from about $20,000 to about $26,000. For people with a master's degree from about $24,000 to about $38,000. For people with a Ph.D get $44,000 to $56,000 or more.

Most Entomologists work a 35 to 40 hour week. However, those engaged in research may work irregular or overtime hours. College teachers generally work schedules similar to other faculty members.

Entomologists work in both indoor and outdoor surroundings, such as farm and ranch lands; forests; areas in which food and other products are processed, transported, or stored; homes and businesses;etc. Some hazards are involved in working with chemicals, harmful insects,etc.,but adherence to safety precautions reduces risk of injury or illness.

Entomologists working in sales spend a considerable amount of time traveling and meeting with regular and prospective customers. College teaching is normally performed in well-lighted and equipped classrooms and laboratories.

You might wonder if there are any entomologist, well there are. One is Dr. Bill Gotwald . Dr. Gotwald is an Entomologist and a Biology Professor. He is an Entomologist who specilizes in ants; African ants. He teaches at Utica College, Utica, New York. Dr. Gotwald has spent 2 summers in Africa studying African ants. Dr. Gotwald sees his Entmology as one facet of his contribution. He enjoys reasearch, teaching, and helping those inside the academic community.

BY: J.P. BLACKFORD
AGE: 12
SCHOOL: ST. ANSELM'S ABBEY SCHOOL

MY FUTURE CAREER

One day I hope to be a thoracic surgeon.A thoracic surgeon is a person who operates and corrects problems in the thoracic cavity ,which is the inside of the upper body.The way that the human body functions is very interesting in terms of how organs function to make up the body.

I became interested in the human anatomy because my mother used to teach me the basic parts of the human body and other things in biology.I also read many books and scripts about organs and their systems.I think it would be worth 10-12 years in college to save people with fatal chest diseases and malfunctions.

Science,biology,chemistry,and math will increase my knowledge in the field that I would like to enter.As far as salaries , a standard surgeon makes as much as $45,000 in a starting year,and between $60,000 and $90,000 in later years.One standard surgeon holding a bachelor's degree ,a master's degree ,and a medical degree ,depending on the institute may make as much as $110,000 a year.According to THE 1977 CAREERS SERIES ON MEDICAL DOCTORS , head surgeons may make up to $15,000 more as thir experience increases.

Places of learning for a medical doctor , nurse , etc. are distributed all over the United States.A few institutions for example are Harvard Medical School , Howard Medical Unit , and The University Of California.About 55% of the medical doctors and surgeons work in public facilities , the others in private corporations or single enterprises.

Working conditions for this field must be virtually germ-free and at a comfortable room temperature.The surgeons usually perform in well-lighted laboratories , furnished with modern test equipment.The physical demand for this occupation is fairly great , the requirements state that you must be clean , have excellent eyesight , and be very steady Workers may also have to stand for hours at a time.

Aspirants to this career should have above average interest in science , especially biology dealing with the human anatomy.Dependability , patience , and the ability to follow instructions are also mandatory.

At this stage in my life I plan to attend Harvard Medical School , to get a bachelor's degree , a master's degree , and a medical degree.I know that I will someday reach this goal If I keep trying hard.I feel that the world needs more people like this so others can benifit.

THIS REPORT WAS DONE BY KRISTEN AARON RENNER
JULY 23,1986
GRADE 8
STUART HOBSON MIDDLE SCHOOL
AGE 12

THE CAREERS OF MY LIFE

Hello my name is Robbie Bradley and I am interested in engineering. What kind of engineering, I haven't decided yet. My choices are **PHYSICAL SCIENCE ENGINEER,PETROLEUM ENGINEER** or an **ELECTRICAL ENGINEER.** I know that a petroleum engineer's get paid the most money but since the price of oil went down so the prices of the salaries went down. Now an electrical engineer gets paid as much as a petroleum engineer but a slite lower. These results lead me to conclude that I should be an petroleum engineer or an electrical engineer.

I would like to be an electrical engineer because it seems very interesting and very rewarding. It gives good benefits and a penchen that I can use when I get old. It will also give me a chance to better myself and feel good that I'm doing something for others and myself. the rest of the engineering jobs give the same benefits but they don't pay as much except the petroleum engineer.

The education aspect of the problem is that you will have to take extensive science and math training and take at least 4 years of collage and four years of grade school that will complete the job. If you did not go to collage you must go to some kind of training of prep school.

My future prospects are to become an engineer and to own

a **LAMBIGINI**,or a **ROLL'S ROYCE**,or may be a MERCERDES. I would also want to live in a lavish home. It will be very incredible but I can handle it and with a little help from my friends. I also want to have a wife and three children and I want to experience life the way I did not.

I will like the location to be in a area that I am familiar with like the climate the population the fashion the look the style the feel for real society. The last and final thing I want is to live a happy life with my fellow friends.

ROBBIE BRADLEY
BACKUS Jr. HIGH
14 YEARS OF AGE

JULY 23, 1986