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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 1: Basic Research</i>					PE 0601120D8Z I <i>National Defense Education Program (NDEP)</i>							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	132.522	144.841	132.347	-	132.347	142.716	149.913	155.667	158.781	-	-
120: <i>National Defense Education Program (NDEP)</i>	-	132.522	144.841	132.347	-	132.347	142.716	149.913	155.667	158.781	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build Sustainable and Long-Term Advantage, and Taking Care of People.

The National Defense Education Program (NDEP) fosters and enhances the Department of Defense's (DoD) ability to develop and access high-quality science, technology, engineering, and mathematics (STEM) talent vital to national defense, now and in the future. The NDEP is executed by the Office of the Under Secretary of Defense for Research and Engineering (OUSDR&E). Aligned to the Federal STEM Strategy, the NDEP addresses critical STEM education and talent development challenges using a continuous learning structure and evidence-based approaches. Specifically, the NDEP is part of the broader Department-wide effort under DoD STEM, which works collectively with partners from academia, industry non-profit organizations, defense laboratories, and other government entities to: (1) build strong foundations for STEM literacy; (2) increase diversity, equity, and inclusion in STEM; and (3) prepare the STEM workforce of the future. The DoD STEM and NDEP activities engage in assessment and evaluation practices as outlined by the Office of Management and Budget and the Government Accountability Office.

The NDEP's portfolio includes: the Science, Mathematics, and Research for Transformation (SMART) program; STEM Education and Outreach efforts including the Defense STEM Education Consortium (DSEC); and specific Congressionally directed programs, to include the Manufacturing Engineering Education Program (MEEP) and broader NDEP funding opportunities in STEM education and workforce development. NDEP activities align with the Department's vision of a diverse STEM talent pool readily accessible to serve our Nation and evolve the Department's competitive edge. The NDEP aligns to the DoD STEM Strategy in support of the National Defense Strategy and the DoD science and technology (S&T) modernization priorities.

NDEP activities further support the DoD STEM effort in providing authentic learning experiences through a variety of education and outreach initiatives in the form of scholarships, internships, enrichment activities, competitions, and mentorships by leveraging partners from industry, academia, and other government organizations with a shared STEM mission. The DoD STEM programs span across all age groups, including kindergarten through twelfth grade (K-12) students and teachers and postsecondary, undergraduate, and graduate students.

The SMART program awards highly competitive scholarships-for-service to undergraduate and graduate students in 21 STEM academic disciplines and hires the students, upon graduation, into DoD's workforce. As part of the SMART experience, scholars engage in internships that allow for relevant hands-on research and work experiences in DoD facilities, thereby enhancing their educational experience. Since its inception as a pilot program in FY 2005, SMART has awarded approximately 3,400 scholarships to students pursuing undergraduate to doctoral studies. To date, approximately 2,400 students have completed their academic pursuit and

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transitioned into DoD employment with approximately 650 more currently pursuing their SMART-funded degree. Approximately 1,700 participants have successfully completed the program through their DoD Service commitment. SMART ensures the Department has a steady infusion of high-quality technical talent, prepared in areas of critical importance to DoD, and ready to apply their technical knowledge, skills, and abilities to fulfill DoD’s mission.

The NDEP will continue to support the preparation of dependents of members of the armed forces for careers in STEM as enacted under 10 USC 2192(b) in FY 2020. STEM education and outreach activities and awardees through NDEP Congressional Adds will continue to engage military connected students in collaboration with the Department of Defense Education Activity (DoDEA). Additionally, where feasible, NDEP activities will also support the Supporting Veterans in STEM Careers Act, enacted in FY 2020.

STEM Education and Outreach is a multitude of cohesive and coordinated activities for PreK-16 students, teachers, and schools, especially those for underrepresented and underserved communities, to include military connected students. In March 2019, the Defense STEM Education Consortium (DSEC) was established to facilitate these efforts. The DSEC is a consortium model approach that leverages a collaborative ecosystem/partnership between academia, industry, not-for-profit organizations, and government that aims to broaden STEM literacy and develop a diverse and agile workforce to power the United States’ innovative defense infrastructure. The DSEC is a five-year, \$75.000 million investment, which comprises a diverse consortium of program partners and is designed to leverage evidence-based approaches to inspire and develop the U.S. science and technology future workforce. Finally, the DSEC is designed to evolve over time and has built-in Innovation Bloc (IB) funding which allows the consortium to address emerging issues in STEM education and potential gaps within the portfolio.

The DoD consistently seeks innovative scientific and technological solutions to address current and future military requirements. The MEEP will enhance existing, or establish new education programs (or collection of programs), to better position the current and next generation manufacturing workforce to produce military systems and components that assure technological superiority for the Department. The BIOTECH Education Program will establish new educational programs that align with BIOTECH Modernization priorities.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	137.154	112.195	0.000	-	0.000
Current President's Budget	132.522	144.841	132.347	-	132.347
Total Adjustments	-4.632	32.646	132.347	-	132.347
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	33.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-4.606	-			
• Adjustments to Budget Year	-	-	127.782	-	127.782
• Other Reprogramming	-0.026	-	-	-	-
• Economic Assumption	-	-	4.565	-	4.565

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• FFRDC	-	-0.354	-	-	-
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Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 120: National Defense Education Program (NDEP)

Congressional Add: Basic Research

Congressional Add: Civics Education

Congressional Add: SMART Diversification Activities

Congressional Add: STEM Programs

Congressional Add: Civil Society

Congressional Add Subtotals for Project: 120

Congressional Add Totals for all Projects

	FY 2021	FY 2022
	34.913	-
	2.000	2.000
	-	2.000
	-	14.000
	-	15.000
Congressional Add Subtotals for Project: 120	36.913	33.000
Congressional Add Totals for all Projects	36.913	33.000

Change Summary Explanation

FY 2022 Appropriation includes Congressional Adds, as follows:

\$2.000 million - SMART diversification activities

\$14.000 million - STEM programs

\$2.000 million - civics education

\$15.000 million - civil society

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

C. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Workforce Development - Science, Mathematics, and Research for Transformation (SMART) Defense Education Program	74.784	88.843	103.900
Description: SMART is a scholarship-for-service program that provides support to high performing U.S. graduate and undergraduate students in 21 academic science, technology, engineering, and mathematics (STEM) disciplines identified as areas of future workforce priorities for the DoD.			
The disciplines align with the Department's Science and Technology (S&T) priorities and emerging scientific research areas, such as: Aeronautical and Astronautical Engineering; Biomedical Engineering; Biosciences; Chemical Engineering; Chemistry; Civil Engineering; Cognitive, Neural, and Behavioral Sciences; Computer and Computational Sciences/Computer Engineering; Electrical Engineering; Environmental Sciences; Geosciences; Industrial and Systems Engineering; Information Sciences; Materials Science and Engineering; Mathematics; Mechanical Engineering; Naval Architecture and Ocean Engineering; Nuclear			

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Engineering; Oceanography; Operations Research; and Physics. Upon completion of their degree, students fulfill a service commitment to the Department on a one-to-one payback per year of education funded.</p> <p>Since FY 2005, the SMART program has awarded approximately 3,400 scholarships to scholars engaging with 211 sponsoring facilities across the entire DoD, including the Army, Navy, Air Force and other DoD agencies. Over 90% of the participants have successfully completed, or are on track to complete, both their SMART-funded degree pursuit and their DoD employment agreement.</p> <p>Oversight of the SMART program falls under the purview of Office of the Under Secretary of Defense for Research and Engineering (OUSDR&E) with execution at the Component level. Two types of individuals participate in the program: (1) retention scholars who are current DoD employees; and (2) recruitment scholars who are students enrolled in undergraduate and graduate programs and represent new technical expertise for the Department. Internships provide SMART scholars with an opportunity to engage in the DoD science and technology enterprise through research and work experiences in defense laboratories, thereby enhancing their educational experience and understanding the relevance of DoD research priority areas.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> • Continue to ensure SMART awards meet the technical needs of the Department's STEM workforce and sustain the scientific and technological superiority on the battlefield. • Continue to strengthen partnerships with Historically Black Colleges and Universities and Minority-serving Institutions (HBCU/ MIs) to increase diversity and awareness of research and STEM initiatives that meet DoD Component and Laboratory mission needs. • Conduct a SMART Symposium and grow the SMART Ambassador program and SMART Scholars Steering Committee (SSSC) to continually enhance inter-Service collaboration and provide scholars a networking forum. • Continue SMART SEED initiative to provide an opportunity to competitively award research grants to scholars who have pursued a PhD through the SMART Program and are currently in the service commitment phase of their scholarship. As future science and technology leaders within the DoD, SEED grants provide opportunities for early-career researchers to establish and lead their own basic and applied research under the mentorship of a more senior subject matter expert, while also providing networking opportunities to other related activities across the DoD. This effort aims to enhance the scholar's experience during their service commitment, and prepares awardees for long-term success as more seasoned technical experts within the DoD workforce. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> • Award 350-400 new scholars (projected). • Implement strategic HBCU/MI initiative to increase diversity of the applicant pool and awareness of research and STEM initiatives that meet DoD Component and Laboratory mission needs and the modernization priority areas. 			

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
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<ul style="list-style-type: none"> • Conduct an annual forum for current and prospective DoD sponsoring facilities (SFs) to highlight SMART program benefits, share best practices, and enhance technical engagement with scholars, HBCU/MIs, and OSD leadership. • Continue to optimize SMART Information Management System (SIMS) to identify process efficiencies in data collection, communication, and virtual engagement with scholars, SFs, SMART Advisory Council, program office and support staff. • Increase SEED research grant awards to scholars who have pursued a PhD through the SMART program and are currently in the service commitment phase of their scholarship. <p>FY 2022 to FY 2023 Increase/Decrease Statement: Additional funding will allow the program to increase the number of scholarships to be awarded in FY 2023 to help meet the DoD's workforce needs. The program typically awards approximately 250-300 scholarships annually. The funding increase will allow approximately 350-400 scholarships in FY 2023. Additionally, the funding increase will allow growth of the successful SMART SEED grant program for PhD scholars during their employment obligation phase, as well as provide opportunities to establish strategic partnerships aimed at broadening diversity among program applicants.</p>			
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<p>Title: Science, Technology, Engineering, and Mathematics (STEM) Education and Outreach</p> <p>Description: The NDEP's STEM Education and Outreach activities provides learners and educators across the pre-K to 16+ continuum unique experiences aimed to inspire, cultivate, and develop exceptional STEM talent poised to tackle evolving defense technological challenges. In order to build a workforce that solves national defense needs and challenges, the DoD recognizes the necessity for increased participation of underserved groups in STEM activities and education programs. Investments are made to promote participation in national-level STEM programs and initiatives and provide authentic learning experiences for students and teachers across the globe. STEM Education and Outreach activities are aligned to the Department's STEM Strategic Plan, support the Federal STEM Education Strategic Plan, and enable the Department to have enduring access to STEM talent, now and into the future.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> • Continue to provide STEM Education and Outreach activities with emphasis on authentic hands-on experiences to students and teachers and evaluate the effectiveness of the increased outreach. • Continue to leverage DSEC partnerships, STEM ecosystems, and other government partnerships to amplify awareness and broaden reach. • Continue to participate in inter- and intra-departmental collaboration with stakeholders to achieve Federal and DoD STEM objectives. • Continue to expand the experience of DoD-supported STEM education and outreach opportunities to reach all populations, through consideration of the barriers faced by underserved and underrepresented populations. 	18.825	20.998	26.447
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • Coordinate with DoD Components to develop an Implementation Plan in support of Strategic Plan. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> • Continue to provide STEM Education and Outreach activities with emphasis on authentic hands-on experiences to students and teachers and evaluate the effectiveness of the increased outreach. • Continue to leverage DSEC partnerships, STEM ecosystems, and other government partnerships to amplify awareness and broaden reach. • Continue to participate in inter- and intra-departmental collaboration with stakeholders to achieve Federal and DoD STEM objectives. • Continue to expand the experience of DoD supported STEM education and outreach opportunities to reach all populations, through consideration of the barriers faced by underserved and underrepresented populations. • Publish a five-year report on establishing baseline metrics and reporting on EAC efforts across the Department. <p>FY 2022 to FY 2023 Increase/Decrease Statement: The increase in funding will support the continuation and expansion of STEM education and outreach opportunities.</p>			
<p>Title: Biotechnology (BIOTECH) Education Program</p> <p>Description: In order to build a BIOTECH workforce that solves national defense needs and challenges, the DoD recognizes the importance of supporting domestic programs that motivate young people to pursue education and career opportunities in biotechnology.</p> <p>FY 2022 Plans: Support DoD and Federal STEM Education Strategy and Department’s BIOTECH Roadmap in building biotechnology literacy, diversity and inclusion, and developing the future biotech workforce.</p> <p>FY 2023 Plans: Support DoD and Federal STEM Education Strategy and Department’s BIOTECH Roadmap in building biotechnology literacy, diversity and inclusion, and developing the future biotech workforce.</p>	2.000	2.000	2.000
Accomplishments/Planned Programs Subtotals	95.609	111.841	132.347

Congressional Add: Basic Research	FY 2021	FY 2022
	34.913	-

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	FY 2021	FY 2022
FY 2021 Accomplishments: Published a funding opportunity announcement which seeks to expand STEM education, outreach, and workforce development programs that support the DoD and Federal STEM Education Strategic Plan.		
Congressional Add: Civics Education FY 2021 Accomplishments: Published a funding opportunity announcement to implement a pilot program on enhanced civics education in coordination with the DoD Education Activity (DoDEA) and the Junior Reserve Officer's Training Corps (JROTC), and in consultation with the Department of Education. FY 2022 Plans: Section 234 of the FY 2020 National Defense Authorization Act (NDAA) established a pilot program to enhance educational offerings that address critical thinking and media literacy; voting and other forms of political and civic engagement; understanding the U.S. law, history, and Government; and interest in employment and careers in public service. Funding will be applied to outreach activities to amplify the public's awareness of STEM careers in the Department.	2.000	2.000
Congressional Add: SMART Diversification Activities FY 2022 Plans: The program increase will support the requirements of Sections 242 and 250 of the FY 2021 NDAA and the Department's strategic goals in Diversity, Equity, Inclusion, and Accessibility. Funding will be used to increase the number of scholarship awards, establish incentivized strategic recruiting partnerships with HBCU/MIs and affinity groups, and/or support new program initiatives to support underrepresented scholars during their service commitment phase. These efforts lend to the SMART Program's strategic goal of diversifying the applicant and award pools, which will ultimately diversify the Department's technical talent needed to address critical technologies now and in the future.	-	2.000
Congressional Add: STEM Programs FY 2022 Plans: Pursue projects in partnership with organizations with an established history of providing scholarships to students pursuing an education in these fields.	-	14.000
Congressional Add: Civil Society FY 2022 Plans: Identify and work with universities with ethics and public affairs programs to promote civil society education and outreach, including among military and non-military communities.	-	15.000
Congressional Adds Subtotals	36.913	33.000

D. Other Program Funding Summary (\$ in Millions)
N/A

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D. Other Program Funding Summary (\$ in Millions)

Remarks

E. Acquisition Strategy

N/A