Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Office of the Secretary Of Defense	Date: May 2021
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 1: *Basic Research*	**R-1 Program Element (Number/Name)** PE 0601120D8Z / *National Defense Education Program (NDEP)*

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	139.002	137.154	112.195	-	112.195	-	-	-	-	-	-
120: *National Defense Education Program (NDEP)*	-	139.002	137.154	112.195	-	112.195	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

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. NDEP is executed by the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)). Aligned to the Federal STEM Strategy, NDEP addresses critical STEM education and talent development challenges using a continuous learning structure and evidence-based approaches. Specifically, NDEP is part of the broader Department-wide effort under DoD STEM, which works collectively with partners from academia, industry, not-for-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. NDEP components engage in assessment and evaluation practices as outlined by the Office of Management and Budget and the Government Accountability Office.

NDEP's portfolio includes: the Science, Mathematics, and Research for Transformation (SMART) program; STEM Education and Outreach; and the Manufacturing Engineering Education Program (MEEP). 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. 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 supports 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 12th grade (K-12) students and teachers; postsecondary, undergraduate and graduate students.

The SMART program awards highly competitive scholarships-for-service to undergraduate and graduate students in 22 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 3,044 scholarships to students ranging from undergraduate to doctoral studies. To date, approximately 2,000 students have completed their academic pursuit and transitioned into DoD employment. Approximately 1,200 participants have successfully completed the program through their DoD Service commitment, of which 71 percent of those participants continue to be employed by DoD. 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.

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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 FY20. STEM education and outreach activities as well as MEEP efforts 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 FY20.

STEM Education and Outreach is a multitude of cohesive and coordinated activities for K-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. 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. DSEC is a 5-year, $75M 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, 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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	144.074	100.241	106.285	-	106.285
Current President's Budget	139.002	137.154	112.195	-	112.195
Total Adjustments	-5.072	36.913	5.910	-	5.910
• Congressional General Reductions	-	-0.087			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	37.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-5.072	-			
• Program Adjustments	-	-	5.910	-	5.910

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Project: 120: *National Defense Education Program (NDEP)*		
Congressional Add: *Regional Fabrication and Certification Training Labs*	15.000	-
Congressional Add: *Basic Research / STEM Education Program Increase*	35.000	35.000
Congressional Add: *Civics Education*	2.000	2.000

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Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2020	FY 2021
Congressional Add Subtotals for Project: 120	52.000	37.000
Congressional Add Totals for all Projects	52.000	37.000

Change Summary Explanation

FY 2022 increase for Science and Technology Scholarships.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Workforce Development - Science, Mathematics, and Research for Transformation (SMART) Defense Education Program	65.932	77.013	88.843

Description: 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 Science; 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 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.

Since FY 2006, the SMART program has awarded 3,367 scholarships to scholars engaging with 206 sponsoring facilities across the Department of Defense. In part, SMART's success is measured by participants that choose to remain in the DoD workforce beyond their required service commitment. Approximately 91% of the participants have successfully completed their service agreement. To date, these scholars have transitioned as civilian employees into the Air Force, Army, Navy, and other DoD components.

Oversight of the SMART program falls under the Office of the Under Secretary of Defense for Research and Engineering (USD(R&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.

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2021 Plans: • Strengthen mentorship opportunities at the sponsoring facilities/laboratories to better acclimate scholars to DoD civilian service and prepare them to excel in their chosen career paths. • Continue to make SMART awards to meet the technical needs of the Department's STEM workforce and sustain the scientific and technological superiority to enable unquestioned battlefield dominance. • Implement a robust recruitment effort focusing on disciplines supporting the advancement of Artificial Intelligence, Microelectronics, Biotechnologies, Hypersonics, and the remaining DoD priority areas, within the DoD to ensure the Department continues to meet the increasing needs of the DoD STEM workforce. • Continue to strengthen partnerships with 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 re-energize the SMART Ambassador program and SMART Scholars Steering Committee (SSSC) to continually enhance inter-Service collaboration and provide scholars a networking forum. ***FY 2022 Plans:*** • 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 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 scholar experience during their service commitment, and prepares awardees for long term success as more seasoned technical experts within the DoD workforce. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Additional funding will allow the program to increase the number of scholarships to be awarded in FY 2022 to help meet the DoD's workforce needs. The program typically awards approximately 250-300 scholarships annually. This funding increase will award approximately 350-400 scholarships in FY 2022.			
Title: Military Families - Pilot Program to Enhance the Preparation of Dependents of Members of the Armed Forces for Careers in STEM (Military Child Pilot Program (MCCP))	11.483	-	-

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: The MCPP was formally established by the FY 2015 National Defense Authorization Act (NDAA), Section 233, and the Consolidated and Further Continuing Appropriations Act, 2015. The objectives of the program are to enhance the preparation of dependents of members of the armed forces for careers in STEM and to provide assistance to STEM teachers at elementary or secondary schools in which a significant number of military dependents are enrolled. The Department currently provides in-classroom STEM program support to students and teachers in covered schools. The original Military Child Pilot Program Authority expired at the end of FY 2020. However, NDEP and the broader DoD STEM efforts will continue to support the preparation of military connected students in STEM careers. Beginning in FY21, MCPP efforts will be integrated into the broader DoD STEM efforts.			
Title: Science, Technology, Engineering, and Mathematics (STEM) Education and Outreach	9.587	21.141	21.352
Description: NDEP's STEM Education and Outreach activities provides students and teachers across the K-16 continuum unique experiences aimed to support and cultivate STEM talent with minds for innovation, diversity of thought, and the technical agility to sustain the Department's competitive edge into the future. 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. ***FY 2021 Plans:*** • Will 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. • Will continue to participate in inter- and intra-departmental collaboration with stakeholders to achieve Federal and DoD STEM objectives. • 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. • Will finalize the Department's new STEM Strategic Plan. • Will fully integrate Military Child Program into all STEM Education and Outreach efforts. ***FY 2022 Plans:*** • 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.			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
• Continue to leverage DSEC Consortium 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. • Coordinate with DoD Components to develop an Implementation Plan in support of Strategic Plan. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Changes reflect minor budget fluctuations.			
Title: Biotechnology (BIOTECH) Education Program ***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. ***FY 2021 Plans:*** • Support DoD and Federal STEM Education Strategy and the Department's BIOTECH Roadmap in building biotechnology literacy, diversity and inclusion, and developing the future biotech workforce. • Communicate DoD's support for U.S. BIOTECH workforce development, which includes increasing U.S. participation in iGEM (International Genetically Engineered Machine) Competition that attracts students from more than 40 countries around the globe by providing a mentor-based program that builds science and engineering skills to foster the next generation of BIOTECH leaders. ***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.	-	2.000	2.000
Accomplishments/Planned Programs Subtotals	87.002	100.154	112.195

	FY 2020	FY 2021
Congressional Add: Regional Fabrication and Certification Training Labs	15.000	-
FY 2020 Accomplishments: • Funding was sent to AFRL to support their programs in this area, which will: • Develop and implement a concept of operations for regional training development and curation featuring (but not limited to) community colleges and career technical centers.		

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	FY 2020	FY 2021
• Develop a Training, Curriculum, and Certification Program which accommodates a variety of future manufacturing skill needs and which is based on input from manufacturers, academia, content developers and subject matter experts. • Develop a credentialing strategy which would be recognized and validated by Industry. • Develop an Industry 4.0 Career Pathways Model which ensures that programs are aligned with industry demand and offer predictable transitions for students.		
Congressional Add: Basic Research / STEM Education Program Increase ***FY 2020 Accomplishments:*** • Published a request for information (RFI) on grants.gov. Reviewed and analyzed responses to questions on (1) STEM education, outreach, and workforce development; (2) biotechnology education and workforce development; and, (3) enhanced civics education. • Hosted a webinar based on the RFI, which discussed additional topics such as:(1) COVID-19 impacts to STEM education; (2) best practices in formal/informal STEM education especially in reaching underserved/ underrepresented populations, to include military connected students; (3) biotechnology education and workforce development; and (4) addressed educational goals and pathways under the Federal STEM Education Strategic Plan. Over 400 individuals registered from across the Components, federal agencies, academia, non-profit, and industry. • Conducted analysis on the information captured from the webinar and from the RFI to inform requirements on funding opportunity announcement (FOA). • Published an FOA on 10 December 2020, seeking grant proposals for opportunities that expand on existing STEM education, outreach and workforce development programs ***FY 2021 Plans:*** Seek further opportunities to expand STEM education, outreach and workforce development programs that support the DoD and Federal STEM Education Strategic Plans through a funding opportunity announcement (FOA).	35.000	35.000
Congressional Add: Civics Education ***FY 2020 Accomplishments:*** • Published a request for information (RFI) on grants.gov. Reviewed and analyzed responses to questions on (1) STEM education, outreach, and workforce development; (2) biotechnology education and workforce development; and, (3) enhanced civics education. • Hosted a webinar based on the RFI, which discussed additional topics such as: (1) COVID-19 impacts to STEM education; (2) best practices in formal/informal STEM education especially in reaching underserved/ underrepresented populations, to include military connected students; (3) biotechnology education and workforce development; and (4) addressed educational goals and pathways under the Federal STEM Education	2.000	2.000

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	FY 2020	FY 2021
Strategic Plan. Over 400 individuals registered from across the Components, federal agencies, academia, non-profit, and industry. • Conducted analysis on the information captured from the webinar and from the RFI to inform requirements on funding opportunity announcement (FOA). • Published an FOA on 10 December 2020, seeking grant proposals for opportunities that enhance civics education through: the development or modification of curricula relating to civics education; classroom activities, thesis projects, individual or team projects, internships, or community service activities relating to civics; collaboration with government entities, nonprofit organizations, or consortia of such entities and organizations to provide participants with civics-related experiences;and civics-related faculty development programs. ***FY 2021 Plans:*** Seek further opportunities to expand STEM education, outreach and workforce development programs that support the DoD and Federal STEM Education Strategic Plans through a funding opportunity announcement (FOA).		
Congressional Adds Subtotals	52.000	37.000

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

N/A