PROGRESS REPORT ON THE IMPLEMENTATION OF THE FEDERAL STEM EDUCATION STRATEGIC PLAN

A Report by the

OFFICE OF SCIENCE AND TECHNOLOGY POLICY

December 2020

About the National Science and Technology Council

The National Science and Technology Council (NSTC) is the principal means by which the Executive Branch coordinates science and technology policy across the diverse entities that make up the Federal research and development enterprise. A primary objective of the NSTC is to ensure science and technology policy decisions and programs are consistent with the President's stated goals. The NSTC prepares research and development strategies that are coordinated across Federal agencies aimed at accomplishing multiple national goals. The work of the NSTC is organized under committees that oversee subcommittees and working groups focused on different aspects of science and technology. More information is available at http://www.whitehouse.gov/ostp/nstc.

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About the Federal Coordination in STEM Education Subcommittee

The Federal Coordination in STEM Education (FC-STEM) is a subcommittee of the NSTC Committee on STEM Education (CoSTEM), which was established pursuant to the requirements of Section 101 of the America COMPETES Reauthorization Act of 2010 (42 U.S.C. §6621). In accordance with the Act, CoSTEM reviews science, technology, engineering, and mathematics (STEM) education programs, investments, and activities, and the respective assessments of each, in Federal agencies to ensure that they are effective; coordinates, with the Office of Management and Budget, STEM education programs, investments, and activities throughout the Federal agencies; and develops and implements through the participating agencies a Federal STEM education strategic plan, to be updated every five years. FC-STEM advises and assists CoSTEM and serves as a forum to facilitate the formulation and implementation of the strategic plan.

About this Document

The intent of this progress report is to provide Congress and the wider STEM education stakeholder community with a window into ongoing and planned Federal activities, with the goal of leading by example toward the North Star vision of the Federal STEM Education Strategic Plan. This progress report includes: a summary of FC-STEM progress on the implementation of the STEM strategy, an analysis of actions developed by the agencies of FC-STEM in support of the Strategic Plan's objectives, a discussion of major focus areas across the Federal STEM education community, a description of the ways Federal agencies will work together to address common challenges, and an inventory of Federal STEM education programs. The annual report also includes actual investments for FY2019, estimated investments for FY2020, and requested funding levels for FY2021 by agencies' Federal STEM programs. This report provides an interim update, covering from August 2019 through May 2020 on STEM education activities of the FC-STEM subcommittee and Interagency Working Groups under CoSTEM. It is responsive to the requirements of Section 101(c) of the America COMPETES Reauthorization Act of 2010 (42 U.S.C. §6621).

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Abbreviations and Acronyms

AFRL	Air Force Research Laboratory		**EERE**	DOE Office of Energy Efficiency and Renewable Energy
APHIS	USDA Animal and Plant Health Inspection Service		**EHR**	NSF Directorate for Education and Human Resources
CCLC	21st Century Community Learning Centers Program		**EM**	DOE Office of Environmental Management
CISE	NSF Directorate for Computing and Information Science and Engineering		**ENG**	NSF Directorate for Engineering
CNCS	Corporation for National Community Service		**EPA**	U.S. Environmental Protection Agency
COE	FAA Air Transportation Center of Excellence		**ETA**	DOL Employment and Training Administration
CoSTEM	Committee on STEM Education		**FAA**	DOT Federal Aviation Administration
CWMD	DHS Countering Weapons of Mass Destruction		**FC-STEM**	Federal Coordination in STEM Education Subcommittee
DHS	Department of Homeland Security		**FDA**	Food and Drug Administration
DOC	Department of Commerce		**FE**	DOE Office of Fossil Energy
DOD	Department of Defense		**FEMP**	DOE Federal Energy Management Program
DOE	Department of Energy			
DOE/ED	DOE Office of Economic Impact and Diversity (This acronym is only used in Appendix 2, DOE inventory listings.)		**FHWA**	DOT Federal Highway Administration
			HBCU-UP	NSF Historically Black Colleges and Universities – Undergraduate Program
DOI	Department of the Interior			
DOL	Department of Labor		**HHS**	Department of Health and Human Services
DOS	Department of State		**HRSA**	HHS Health Resources & Services Administration
DOT	Department of Transportation			
DSEC	Defense Science Technology Engineering and Mathematics Education Consortium		**HUD**	Department of Housing and Urban Development
			IES	ED Institute of Education Sciences
DTRA	DOD Defense Threat Reduction Agency		**IMLS**	Institute of Museum and Library Services
EASE	NSF Excellence Awards in Science and Engineering		**IT**	Information Technology
			IWG	Interagency Working Group
ECR	NSF EHR Core Research		**IWGIS**	Interagency Working Group on Inclusion in STEM
ED	Department of Education			
EDA	DOC Economic Development Administration		**MDA**	DOD Missile Defense Agency
			MPS	NSF Directorate for Mathematical and Physical Sciences
EDMAP	USGS Educational Mapping Program			
EE	EPA Office of Environmental Education		**MSI**	Minority Serving Institution

MUREP	NASA Minority University Research and Education Project		**OSTP**	Office of Science and Technology Policy
NASA	National Aeronautics and Space Administration		**OUSDRE**	Office of the Under Secretary of Defense for Research and Engineering
NCEAI	National Council for Expanding American Innovation		**P&R/M&RA**	DOD Personnel & Readiness/ Manpower & Reserve Affairs
NE	DOE Office of Nuclear Energy		**PAEMST**	Presidential Awards for Excellence in Mathematics and Science Teaching
NIFA	USDA National Institute of Food and Agriculture			
NIH	National Institutes of Health		**PAESMEM**	Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring
NIHF	National Inventors Hall of Fame			
NIST	National Institute of Standards and Technology		**PPP**	Public-private partnerships
			R&D	Research and development
NNSA	DOE National Nuclear Security Administration		**RES**	NRC Office of Nuclear Regulatory Research
NOAA	National Oceanic and Atmospheric Administration		**RFI**	Request for Information
			S&T	Science and Technology
NPS	National Park Service		**SBCR**	NRC Small Business and Civil Rights Office
NRC	Nuclear Regulatory Commission			
NSF	National Science Foundation		**SBIR**	Small Business Innovation Research Program
NSF-INCLUDES	NSF program on Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science			
			SC	DOE Office of Science
			SI	Smithsonian Institution
			SMD	NASA Science Mission Directorate
NSTC	National Science and Technology Council		**STEM**	Science, technology, engineering, and mathematics
ODASART	Office of the Deputy Assistant Secretary of the Army for Research & Technology		**STTR**	Small Business Technology Transfer Program
			TA IWG	Transparency and Accountability IWG
OESE	ED Office of Elementary and Secondary Education		**TCU**	Tribal College and University
			TCUP	NSF Tribal Colleges and Universities Program
OIA	NSF Office of Integrative Activities			
OISE	NSF Office of International Science and Engineering		**U.S.**	United States
			USDA	United States Department of Agriculture
OMB	Office of Management and Budget			
ONR	DOD Office of Naval Research		**USGS**	United States Geological Survey
OPE	ED Office of Postsecondary Education		**USPTO**	United States Patent and Trademark Office
ORD	EPA Office of Research and Development		**VA**	Department of Veterans Affairs

Introduction

Science, technology, engineering, and mathematics (STEM) are the foundation for discovery and technological innovation. STEM skills are increasingly important for all Americans to succeed in the workplace and in their everyday lives. To develop these skills, the Nation must engage in a collaborative effort to ensure that all Americans have access to high-quality STEM education throughout their lifetimes. This effort is especially important for those who are historically underrepresented and underserved in STEM. A well-prepared and diverse STEM workforce is essential to maintaining global leadership as it galvanizes the ingenuity of Americans to accelerate tomorrow's breakthroughs and strengthen our economic and national security.

To this end, in December 2018, the National Science and Technology Council (NSTC) Committee on STEM Education (CoSTEM) released *Charting a Course for Success: America's Strategy for STEM Education*,[1] a five-year STEM education strategic plan, hereafter referred to as the Strategic Plan. This Strategic Plan serves as a "North Star" to the broader STEM education community to chart a course for collective success. Federal agencies engaged in STEM education are now implementing the Strategic Plan, under the guidance of CoSTEM and its Federal Coordination in STEM Education (FC-STEM) Subcommittee.

This progress report describes ongoing efforts and implementation practices across the Federal Government as it works to accomplish the goals and objectives of the Strategic Plan. This report also compiles budget information from all Federal agencies that have investments in STEM education during Fiscal Year (FY) 2019. Additionally, this document is meant to fulfill the requirements under the America COMPETES Reauthorization of 2010[2] that the Office of Science and Technology Policy (OSTP) must transmit a report annually to Congress at the time of the President's budget request providing an update on the STEM Education Federal portfolio performance and an inventory of Federal STEM education investments.

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[1] https://www.whitehouse.gov/wp-content/uploads/2018/12/STEM-Education-Strategic-Plan-2018.pdf
[2] https://www.congress.gov/111/plaws/publ358/PLAW-111publ358.pdf

Five-Year Federal STEM Education Strategic Plan

The Strategic Plan presents a vision for a future where all Americans will have lifelong access to high-quality STEM education and the United States will remain the global leader in STEM literacy, innovation, and employment. It serves as a "North Star" for the broader STEM community as it charts a course for the Nation's success and is responsive to the requirements of Section 101 of the America COMPETES Reauthorization Act of 2010.

The Strategic Plan focuses on three overarching goals:

- ➢ **Build Strong Foundations for STEM Literacy** by ensuring that every American has the opportunity to master basic STEM concepts and to become digitally literate.
- ➢ **Increase Diversity, Equity, and Inclusion in STEM** and provide all Americans with lifelong access to high-quality STEM education, especially those historically underserved and underrepresented in STEM fields and employment.
- ➢ **Prepare the STEM Workforce for the Future**—both college-educated STEM practitioners and those working in skilled trades that do not require a four-year degree—by creating authentic learning experiences that encourage and prepare learners to pursue STEM careers.

The Strategic Plan is further organized around four pathways, representing a cross-cutting set of approaches to improve STEM education that will help fulfill its vision and achieve its three goals:

- ➢ **Develop and Enrich Strategic Partnerships** – Strengthen relationships between educational institutions, industry, and community organizations to leverage resources for the purpose of providing the student with meaningful learning opportunities.
- ➢ **Engage Students where Disciplines Converge** – Draw on knowledge and methods across disciplines to solve complex, real-world problems in STEM using innovation, creativity, and initiative.
- ➢ **Build Computational Literacy** – Design integrated approaches to teaching and learning computational thinking and promote the expansion of digital platform use.
- ➢ **Operate with Transparency and Accountability** – Develop and apply metrics that assess implementation progress in meaningful ways.

Vision

All Americans
will have lifelong access to
high-quality STEM education and the
United States will be the global leader in STEM
literacy, innovation, and employment.

Goals

Build Strong Foundations for STEM Literacy

Increase Diversity, Equity, and Inclusion in STEM

Prepare the STEM Workforce for the Future

Pathways

Develop and Enrich Strategic Partnerships	Engage Students where Disciplines Converge	Build Computational Literacy	Operate with Transparency and Accountability

Objectives

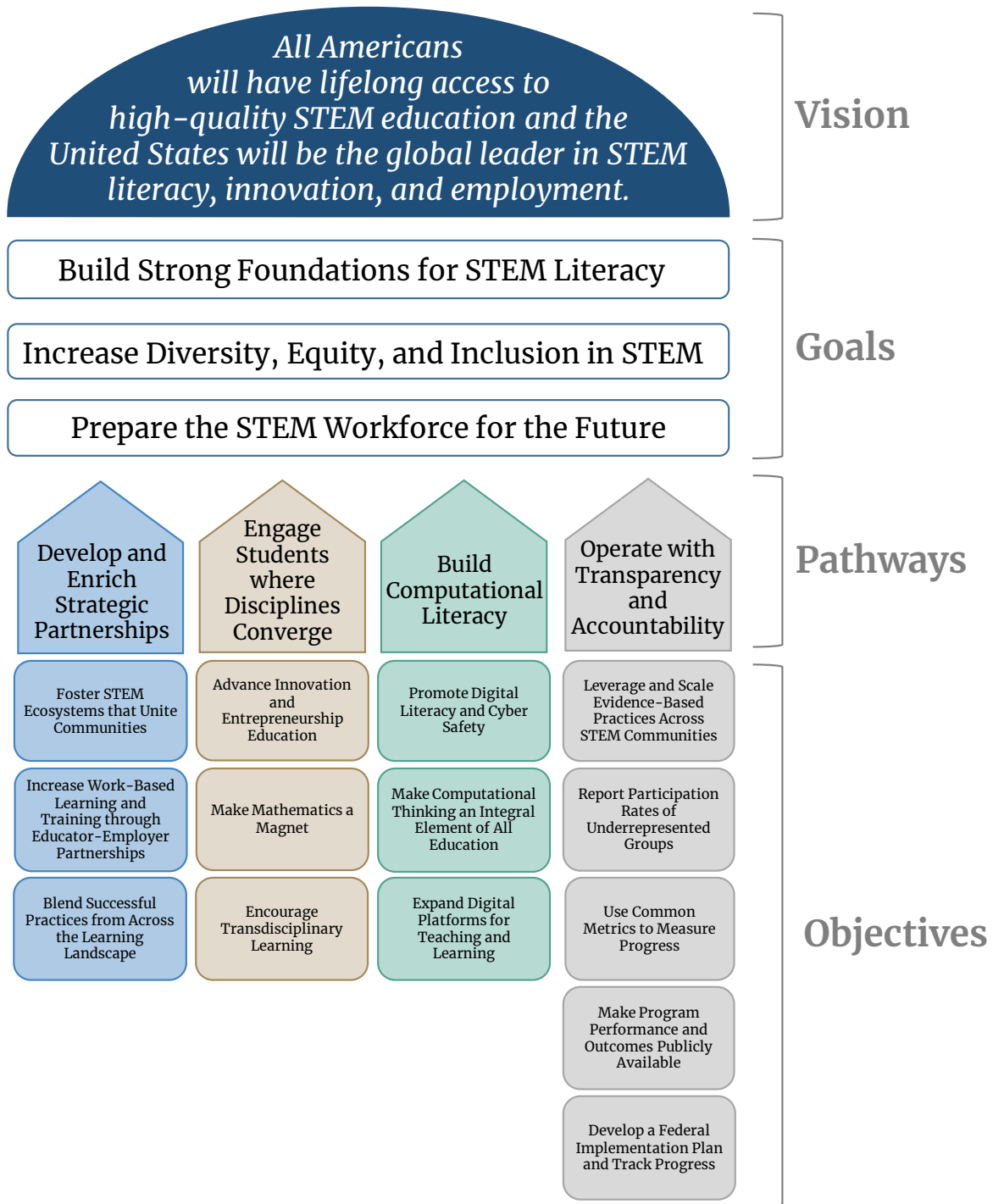|			
Foster STEM Ecosystems that Unite Communities	Advance Innovation and Entrepreneurship Education	Promote Digital Literacy and Cyber Safety	Leverage and Scale Evidence-Based Practices Across STEM Communities
Increase Work-Based Learning and Training through Educator-Employer Partnerships	Make Mathematics a Magnet	Make Computational Thinking an Integral Element of All Education	Report Participation Rates of Underrepresented Groups
Blend Successful Practices from Across the Learning Landscape	Encourage Transdisciplinary Learning	Expand Digital Platforms for Teaching and Learning	Use Common Metrics to Measure Progress
			Make Program Performance and Outcomes Publicly Available
			Develop a Federal Implementation Plan and Track Progress

Figure 1. Schematic illustrating the organizational structure of the Federal STEM Education Strategic Plan released in December 2018. The Strategic Plan's vision is supported by three aspirational goals. Four pathways contain objectives to guide efforts by the Federal government and wider STEM education community to realize the Strategic Plan's vision and goals.

Federal Implementation Efforts: August 2019 to May 2020

The NSTC coordinates science and technology policy across the Federal agencies aimed at accomplishing multiple national goals. The work of the NSTC is organized under committees that oversee subcommittees and working groups focused on different aspects of science and technology. Together they implement the Federal STEM Education Strategic Plan.

Efforts of the Committee on STEM Education (CoSTEM)

CoSTEM is the highest level interagency body in the Federal government devoted to STEM education. It oversees coordination of Federal STEM education programs. CoSTEM also convenes the broader STEM community through stakeholder meetings and events to gain valuable input to guide its work. In FY 2019, CoSTEM developed an implementation structure to support work toward the goals and objectives of the Strategic Plan.

Efforts of the Federal Coordination in STEM Education Subcommittee (FC–STEM)

FC-STEM serves as a forum for discussion and policy coordination to facilitate implementation of the Federal STEM Education Strategic Plan and advises CoSTEM and the OSTP Director on the development and progress of interagency work in STEM education across Federal agencies. FC-STEM also facilitates implementation of the Strategic Plan through interagency working groups (IWGs). The IWGs are organized by the Strategic Plan's four pathways and have laid a foundation for interagency efforts to implement action items. A fifth IWG, the Interagency Working Group on Inclusion in STEM (IWGIS), was chartered by the NSTC in response to Section 308 of the 2017 American Innovation and Competitiveness Act.[3]

The interagency collaboration of FC-STEM empowers agencies to improve STEM education by sharing best practices, leveraging the expertise and resources of Federal partners, and coordinating activities in support of common educational goals. FC-STEM agencies are also working together to maximize the impact of their efforts within the broader STEM education community.

FC-STEM Priorities. FC-STEM, as a collective body, developed priorities to accomplish its goals in support of the Federal STEM Education Strategic Plan. The first of these priorities is working with the Office of Personnel Management and other Federal agencies to better understand existing hiring authorities that could help participants in STEM work-based learning programs transition into permanent Federal employment. FC-STEM then examined current authorities across Federal agencies and proposed ways to increase their use and flexibility through regulatory, administrative or legislative processes. This work directly supports the third goal of the Federal STEM Education Strategic Plan, "Prepare the STEM Workforce for the Future."

FC-STEM's second priority is to determine the feasibility of a single, searchable, user-friendly online resource for STEM education-related Federal activities, resources, and funding opportunities. The study includes a stakeholder analysis to inform the development of an online site in support of broader dissemination of Federal STEM resources.

FC-STEM Assessment. FC-STEM agencies shared how they assessed the impact of agency specific STEM education programs. Mechanisms for data collection varied greatly across programs depending on goals and needs, as did methods for evaluating effectiveness. These included annual program

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3   https://www.congress.gov/114/plaws/publ329/PLAW-114publ329.pdf

assessments, focus groups, pre- and post-surveys, interviews, artifacts, expert input, portfolio analysis, longitudinal tracking and assessment, data analysis, qualitative analysis, research studies, participant listening sessions, third party evaluations, etc. Early analyses of the results found that STEM engagement, interest, identity, and pursuit of advanced degrees in STEM increased as a result of participation in the programs. Some program assessments found gaps in target audiences so direct efforts were instituted to reach these audiences. Assessments are used to guide revisions and refinements to programs and solicitations.

Efforts of the Interagency Working Groups (IWGs)

Five IWGs support FC-STEM as it implements the Strategic Plan and have brought together members who represent the Federal government's foremost experts in STEM education. Four of the IWGs— Computational Literacy, Convergence, Strategic Partnerships, and Transparency & Accountability— concentrate their efforts on one of each of the four pathways outlined in the Strategic Plan. A fifth IWG, the Interagency Working Group on Inclusion in STEM (IWGIS), was chartered by the NSTC in response to Section 308 of the 2017 American Innovation and Competitiveness Act.[4]

The five interagency working groups coordinate to ensure they produce complementary efforts that further the goals and objectives of the Strategic Plan. A model of the relationships between these groups is shown in Figure 2. The sections that follow provide an overview of the foci for each IWG, highlight some of the actions agencies are taking that support the work of the IWG, and provide an overview of the work that the IWGs have prioritized to pursue collaboratively.
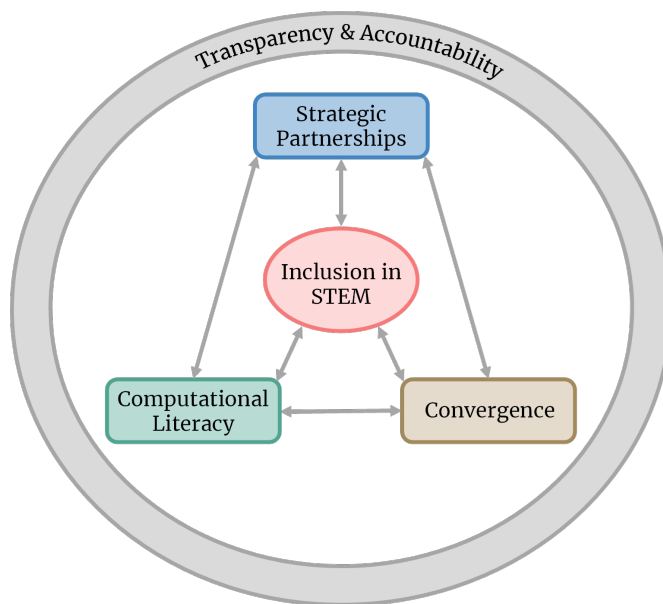
Figure 2. Organizational structure and coordination between the five IWGs of FC-STEM. IWGs devoted to the Strategic Plan's three educational pathways (boxes) will work with each other and with IWGIS (center oval) in order to ensure implementation of activities that promote inclusion, diversity, and equity. The Transparency and Accountability IWG (outer ring) will work to promote best practices, dissemination of resources, and data collection efforts across all other IWG efforts.

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4   https://www.congress.gov/114/plaws/publ329/PLAW-114publ329.pdf

Develop and Enrich Strategic Partnerships (Strategic Partnerships IWG)

Participating Agencies: *DOC, DOD, DOE, DHS, DOI, ED, NASA, NSF, OSTP, SI, and USPTO*

Description: Partnerships among Federal agencies, educational institutions, employers, museums, and other community organizations leverage resources and expertise across STEM education ecosystems to maximize the impact of educational efforts. These connections broaden and enhance the education of today's learners by providing authentic STEM experiences, seamless career and educational transitions, and opportunities for diverse mentorship.

Investment: From the Federal STEM Inventory in **Appendices 1 and 3**, 104 programs with a total FY 2019 investment of $1.88 billion directly or indirectly supported the Strategic Partnerships Pathway under the Federal STEM Education Strategic Plan. These investments are found in DOC, DOD, DOE, DOL, DOT, ED, EPA, HHS, NASA, NSF, SI, USDA, and VA.

Actions Taken Toward Implementation:

To advance strategic partnership objectives, the Strategic Partnerships IWG engaged in discussions with partners and stakeholders. IWG members participated in the 2020 STEM Learning Ecosystems Community of Practice forum to gain a greater understanding of existing ecosystems models. The IWG finalized a definition for *STEM education ecosystems* that will unify agency efforts to build partnerships to support education across the spectrum from early childhood to careers. An output of this effort was a definition that can be used across Federal agencies in future programming, such as grants and contracts.

> **Federal definition for STEM Education Ecosystems:** *STEM education ecosystems consist of multi-sector partners united by a collective vision of supporting participation in STEM through the creation of accessible, inclusive STEM learning opportunities spanning all education stages and career pathways. A STEM education ecosystem continuously evaluates its activities and adapts as needed, plans for the long-term, and communicates its work to build broad support and advance best-practices.*

Agencies use a variety of mechanisms to establish partnerships, including grants, cooperative agreements, interagency agreements, memoranda of understanding, or other formal or informal agreements. Many of these are arrangements are ongoing, but some new ones were launched in 2019.

Many agencies support work-based learning (WBL) at their facilities through scholarship, internship, and fellowship programs. IWG members participated in an FC-STEM cross-agency group to discuss best practices for effective virtual internships. As a result, many agencies were better prepared to quickly adapt students and mentors to a virtual experience. The IWG also examined models that could be used to engage multi-sector partners in WBL and began discussing these across agencies. The IWG engaged SBIR/STTR Program Managers to discuss models for providing internships for students, teachers, Veterans, and underrepresented groups through supplemental grant awards and other mechanisms.

Engage Students where Disciplines Converge (Convergence IWG)

Participating Agencies: *DOC, DOD, DOE, ED, NASA, NSF, OSTP, SI, and USPTO*

Description: When incorporated into STEM teaching, learning, and assessment, real world STEM challenges engage students by drawing on knowledge and methods from across disciplines by promoting initiative and creativity. To encourage transdisciplinary learning, the IWG established a plan to review existing efforts to: (1) support STEM educators and students through upskilling, resourcing,

and providing a forum to share best practices; (2) support the dissemination of effective transdisciplinary STEM education practices and programs to attract a more diverse and inclusive community of participants; and (3) expand support for STEM learners to study transdisciplinary problems through internships, fellowships, scholarships, and other experiential learning opportunities.

Investment: From the Federal STEM Inventory in Appendices 1 and 3, 95 programs with a total FY 2019 investment of $2.22 billion directly or indirectly supported the Convergence Pathway under the Federal STEM Education Strategic Plan. These investments are found in DOC, DOD, DOE, DOT, ED, EPA, HHS, NASA, NSF, SI, USDA, and VA.

Actions Taken Toward Implementation:

The Convergence IWG compiled current research, model programs, and best practices available to support educators and students in transdisciplinary STEM learning and opportunities. This information sharing and collection included DOC, DOD, ED, OSTP, and USPTO providing Federal STEM education updates and agency opportunities in convergence at stakeholder convenings, such as the multi-sector 2020 STEM Learning Ecosystems Community of Practice meeting. Preliminary analysis revealed challenges faced by districts, schools, and teachers to implement formal STEM education that integrates across disciplines.

Informal and extracurricular learning environments provide additional opportunities to incorporate convergent STEM practices, but also highlight challenges related to equity and access. The IWG developed a series of survey questions to gather additional information from stakeholders through a Request for Information. Using existing literature and insight from current research experts, the IWG identified various pathways to convergence in STEM teaching, learning, and assessment. Identifying several methods of transdisciplinary learning used in the field enabled flexible planning and adaptation towards more convergent and transdisciplinary STEM education, regardless of where one falls on the continuum. In this way, the IWG showcased how transdisciplinary STEM education can be accessible and feasible for all.

As part of the Convergence pathway's "Make Math a Magnet" objective, some agencies are integrating mathematics and statistics into STEM training and making datasets accessible for STEM educators to use in applied contexts. For example, the U.S. Census Bureau's Statistics in Schools program strives to make Federal data more accessible by providing classroom-ready math activities for teachers to educate students about the value and everyday use of statistics. This program is capitalizing on the 2020 Census in order to increase awareness and recruit educational partners. In another example. NOAA's National Marine Sanctuaries Program gives students advanced STEM experiences as they compete in building and operating underwater robots.

Build Computational Literacy (Computational Literacy IWG)

Participating Agencies: DOC, DOD, ED, NITRD, NSF, OSTP, SI, USDA, and USPTO

Description: Federal agencies are well-positioned to help Americans of all ages and backgrounds harness the benefits of digital technology and be critical and ethical participants in the digital economy. By developing integrated approaches to teaching and learning computational thinking and supporting new digital technology-based learning environments, agencies can advance mission-critical goals like promoting cyber safety and encouraging responsible data management. In addition, federal agencies are creating internships and job opportunities for students with computational skills. For example, NOAA hired more than 75 students with strong computational skills through the Pathways program.

Investment: From the Federal STEM Inventory in **Appendices 1 and 3,** 75 programs with a total FY 2019 investment of $1.66 billion directly or indirectly supported the Computational Literacy Pathway under the Federal STEM Education Strategic Plan. These investments are found in DOC, DOD, DOE, DOL, DOT, ED, EPA, HHS, NASA, NSF, SI, USDA, and VA.

Actions Taken Toward Implementation:

The Computational Literacy IWG established plans to execute core objectives that encourage the use of a common definition of computational literacy, support dissemination of promising content and practices that promote computational thinking, and expand digital platform use.

The IWG assessed current agency activities in computational literacy to enhance agency coordination and collaboration and ascertain areas of potential unmet need. This assessment included identifying ways to promote the expansion of existing digital platforms across agencies that are available for teaching and learning. The IWG began a literature review and developed protocol to collect baseline data to define computational literacy and develop common metrics to better understand progress.

FC-STEM agencies worked alongside the country's education community to promote digital literacy and cyber safety, including training future STEM workers in digital ethics and privacy. NSF committed $10 million in FY 2019 to the newly launched Data Science Corps to promote data literacy; build capacity to harness data at the local, State and national levels; and provide basic training in data science to the existing workforce across communities. NIH is preparing the next generation of researchers by incorporating computational skills and the principles of responsible data use into all of its programs for undergraduate and graduate students. ED included a computer science preference in several discretionary grant competitions in FY2019, including Education Innovation and Research (EIR) Program-Early-Phase. The DOC National Initiative for Cybersecurity Education Program, led by NIST, facilitated a National Cybersecurity Education Conference and launched the National Cybersecurity Career Awareness Week to promote cybersecurity, ethics, and safety. DOD collaborated with CYBER.ORG to promote and facilitate cyber education for students of military families. In addition, the Presidential Cybersecurity Education Award[5] is a new recognition program led by ED in collaboration with NSF and the National Security Council as charged by President Trump's Executive Order on America's Cybersecurity Workforce.[6]

Diversity, Equity, and Inclusion in STEM (Inclusion in STEM IWG)

Participating Agencies: DOC, DOD, DOE, DHS, DOI, DOS, DOT, ED, EPA, HHS, NSF, NASA, OSTP, SI, USDA, and USPTO

Description: Increasing diversity, equity, and inclusion in STEM is one of the Strategic Plan's three central goals. When an organization's workforce is diverse in terms of gender, race, socioeconomic status, ethnicity, physical ability, geography, etc., and provides an inclusive environment that values diversity and promotes equitable opportunities, the organization better retains talent and is more innovative and productive. Increasing equity and inclusion are fundamental prerequisites for making high-quality STEM education accessible to all Americans and will maximize the creative capacity of tomorrow's workforce.

Investment: From the Federal STEM Inventory in **Appendices 1 and 3**, 125 programs with a total FY 2019 investment of $3.08 billion directly or indirectly supporting the Diversity, Equity and Inclusion Goal

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5   https://content.govdelivery.com/accounts/USED/bulletins/28a9a32
6   https://www.whitehouse.gov/presidential-actions/executive-order-americas-cybersecurity-workforce/

under the Federal STEM Education Strategic Plan. These investments are found in DOC, DOD, DOE, DOI, DOL, DOT, ED, EPA, HHS, NASA, NSF, SI, USDA, and VA.

Actions Taken Toward Implementation:

Efforts toward inclusion in STEM across FC-STEM agencies are coordinated by the IWGIS. In the past year, the IWGIS identified two priority areas.

The first priority is to develop a resource for sharing best practices for diversity and inclusion across Federal agencies. Over the last year, this priority involved gathering information about practices that are working to make measurable change on diversity and inclusion. The IWGIS worked in collaboration with other IWGs to clarify the definitions for best practices, promising practices, emerging practices, and evidence-based practices. The second priority was evaluation tools. For this effort, the IWGIS worked with the Transparency and Accountability IWG to develop evaluation tools that can be used across government to measure the reach of Federal programs into diverse populations. This joint group worked to learn how diversity is currently measured in programs. The effort also included a policy analysis on elements of the Paperwork Reduction Act with the goal of facilitating an accelerated pathway for approval of a data collection and evaluation instruments.

The IWGIS is one of the cross-cutting IWGs. Progress therefore requires coordination across all three educational pathways in order to implement activities which promote diversity, equity, and inclusion. Joint meetings are used to discuss areas of common interest and plan joint initiatives.

Agencies are planning to build stronger partnerships with institutions that serve underrepresented and underserved groups. NASA, NIH, NIST, DOD, USPTO, ED, NOAA, and USGS, as part of their partnership with the NSF Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES) program, have joined the NSF INCLUDES National Network, which supports broadening participation in STEM.[7] At NSF, the Geoscience Opportunities for Leadership in Diversity – Expanding the Network (GOLD-EN) activity provides funding for projects that develop, scale, and disseminate innovative approaches to diversity and inclusion in geoscience education and research. ED recently funded the STEM Inclusion for Innovation in Early Education Center (STEMI^{2}E^2), which seeks to improve access and participation in STEM learning for young children with disabilities. STEMI^{2}E^2 will also disseminate these practices and support tools to early childhood programs, administrators, providers, families of children with disabilities, and institutions of higher education. Through a public-private partnership, the Smithsonian is helping school districts develop strategic plans to attract and retain STEM teachers from underrepresented groups, with the goal of reaching 30,000 new and existing STEM teachers by 2030. NOAA's Educational Partnership Program (EPP) with Minority Serving Institutions is having a big impact. The EPP partner institutions graduated 60% of the African Americans who earned PhDs in atmospheric science, 55% of the African Americans who earned PhDs in environmental science and 35% of African Americans who earned PhDs in marine sciences.

Additionally, the IWGIS has met with other Federal groups supporting equity and inclusion to learn about their initiatives and share ideas, including the White House Initiative on Historically Black Colleges and Universities (HBCUs).

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[7] https://www.includesnetwork.org

Operate with Transparency and Accountability (Transparency and Accountability IWG)

Participating Agencies: DOC, DOD, DOE, ED, HHS, NASA, NSF, OMB, OSTP, USDA, and USPTO

Description: Across the Federal STEM education enterprise, agencies are working to: develop and apply metrics that assess progress in meaningful ways; identify and scale evidence-based practices; collect data on educational programs, such as performance evaluations, program outcomes, and participation rates for underrepresented groups; and disseminate information to external stakeholders. The complexity of Federal investments in STEM education dictates the multiplicity of approaches that are being pursued to implement the Strategic Plan, and it is an essential consideration for the interagency development of metrics, operational definitions of terms, and best practices. This complexity requires creative and flexible approaches that focus on key points of intersection between programs to help establish and enhance returns on these investments. Developing common metrics may also require consideration of available resources with the understanding that budgets vary widely across the inventory of Federal STEM education programs.

Actions Taken Toward Implementation:

As a first step to ensuring common metrics, the Transparency and Accountability (TA) IWG provided recommendations to FC-STEM for revising the survey information for the Federal STEM Education progress report. Specifically, the TA IWG provided feedback on how investments could be consistently reported across agencies and programs to indicate whether the investment directly or indirectly contributed to the goals or pathways of the strategic plan.

In addition, the TA IWG formed two subgroups to operationalize definitions of the terms 'participant' and 'rural status' that currently differ across agencies and programs. Standard definitions will lay the groundwork for common metrics by ensuring that data can be meaningfully aggregated, accurately interpreted, and readily used to compare similar programs. The TA IWG subgroups developed compendia and recommendations for STEM education 'participant' and 'rural' definitions/designations that were presented at a roundtable meeting. The purposes of the stakeholder engagements were to obtain feedback from FC-STEM agency representatives on the recommended definitions/designations for STEM 'participant' and 'rural;' discuss potential challenges/barriers to implementing proposed definitions/designations; and discuss next steps. FC-STEM accepted the TA IWG recommended definitions and agreed to establish a pilot program to explore the feasibility of implementing the designations across agencies.

FC–STEM Engagement Highlights

Interagency Engagement

FC-STEM's structure enables agencies to collaborate with one another to maximize the impact of Federal STEM investments and activities and better serve stakeholder communities. One example of FC-STEM collaboration is an interagency expansion of NSF INCLUDES that facilitates partnerships, communication, and cooperation.

The purpose of this program is to build and scale up what works in broadening participation programs to reach underserved and underrepresented populations nationwide. ED, NASA, NIH, NOAA, NIST, and USGS initially joined this community to better understand how they can add their external stakeholder networks to the NSF INCLUDES platform and leverage opportunities to use the NSF INCLUDES program to better communicate their STEM education programs and funding resources to the public. A special

Federal agency session at the NSF INCLUDES National Network Convening in May 2019 helped to kick off the interagency expansion. DOD and USPTO became partners in 2019 and joined the agencies noted above for quarterly collaborative meetings.

FC-STEM Convening: To further enhance interagency collaboration in support of STEM education advancement, NSF hosted a meeting on behalf of FC-STEM in December 2019. Over 100 attendees representing DHS, DOD, DOL, DOT, ED, EPA, HHS, HUD, IMLS, NASA, NIH, NIST, NOAA, NSF, NRC, OSTP, SI, USDA, USGS, and USPTO were present. The purpose of this convening was to galvanize communication regarding partnerships and to increase understanding of the opportunities and barriers to interagency collaboration. The National Ocean Science Bowl is another area of strong interagency STEM collaboration. NOAA, NASA, DOI and DOE come together to inspire and engage over a thousand students across the country to learn about the ocean and the Blue Economy.

Presidential Awards: In late October 2019, the Excellence Awards in Science and Engineering (EASE) Recognition Event honored 230 recipients with the Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) and the Presidential Awards for Excellence in Science, Mathematics, and Engineering Mentoring (PAESMEM). For the first time, a majority of FC-STEM members participated in a newly created Federal exhibit area through which they shared resources, answered questions, and provided breakout sessions. Recipients were able to access Federal STEM resources across many agencies. The FC-STEM leadership conducted a listening session with the awardees, in coordination with the release of the 2019 *Progress Report on the Federal Implementation of the STEM Education Strategic Plan.*[8] This event provided the FC-STEM leadership team a better understanding of the impact of the Federal STEM Education Strategic Plan across the States and how the Federal agencies could better serve their communities nationwide in STEM education**.**

External Engagement

Request for Information. Building or refreshing STEM education resources and professional learning opportunities to meet the existing needs of the community is essential to ensure that students continue to engage in high-quality STEM education, whether accessing it remotely or in-person. FC-STEM continues to collect information from the broader STEM education community through a Request for Information posted in the Federal Register.[9] Stakeholders have the opportunity to provide input on anticipated future changes in education; how stakeholders have used the Federal STEM Education Strategic Plan to guide their work; desired features of a Federal STEM education online resource; best practices to increase diversity and inclusion in STEM; needed training for a transdisciplinary approach to teaching STEM; expanding public-private partnerships to increase STEM learning opportunities; and existing programs that integrate computational literacy within STEM curricula. Using this process will provide significant insights to STEM agencies and can help shape future FC-STEM outputs aligned to stakeholders' needs.

STEM Education Advisory Panel. The STEM Education Advisory Panel[10] was established by Congress in October 2017 under the authority of the American Innovation and Competitiveness Act and the Federal Advisory Committee Act. This diverse group of STEM education stakeholders has provided recommendations and advice to CoSTEM regarding the implementation and reporting of the Federal

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[8] https://www.whitehouse.gov/wp-content/uploads/2019/10/Progress-Report-on-the-Federal-Implementation-of-the-STEM-Education-Strategic-Plan.pdf

[9] https://www.govinfo.gov/content/pkg/FR-2020-09-04/pdf/2020-19681.pdf

[10] https://nsf.gov/ehr/STEMEdAdvisory.jsp

STEM Education Strategic Plan. A panel meeting was held virtually in April, and panelists provided valuable suggestions regarding what features and resources might be provided in a Federal online STEM education resource. They also shared recent adjustments made by their respective organizations in response to shifting to distance learning. The panel recognized the increased role of parents as educational aides during this transition and suggested providing more resources targeted towards parents in the future.

Public-Private Partnerships. The Administration recognizes that the responsibility of providing high-quality STEM education is shared among public and private partners, and the development of the country's future STEM workforce can be augmented by expanding public-private partnerships.

Many Federal agencies have ongoing public-private partnerships to leverage non-governmental entities' strengths in providing STEM education opportunities to stakeholders. In 2019, DOD awarded a cooperative agreement to a consortium of 18 organizations, the Defense Science, Technology, Engineering, and Mathematics Education Consortium (DSEC), to improve STEM literacy and develop diverse and agile STEM talent. This consortium serves K-16 students and educators through meaningful formal and informal STEM learning experiences and helps to connect participants to the DOD STEM workforce and DOD careers. This consortium amplifies the reach, visibility, and outcomes of DOD STEM efforts and serves as a force multiplier.

USPTO launched a major initiative aimed at expanding invention, innovation, and entrepreneurship in the United States. The new National Council for Expanding American Innovation (NCEAI), comprised of representatives from industry, academia, and government, will help guide the USPTO in developing a comprehensive national strategy to build a more diverse and inclusive innovation ecosystem by encouraging participation demographically, geographically, and economically. To advance innovation and entrepreneurship, the USPTO partnered with the National Inventors Hall of Fame, a nonprofit organization, to design, develop, and execute preK-12 STEM and intellectual property education programs for 180,000 students and 20,000 teachers annually nationwide.

To help Veterans transition from military service to civilian employment, the VA entered into participation agreements with various training providers to deliver accelerated learning programs in high-need technology fields. The VA incentivized these partners with a "pay-for-performance" model that paid these institutions incrementally based on the progress and success of their Veteran students.

NSF, in partnership with The Boeing Company, developed the EHR Core Research: Production Engineering Education and Research (ECR: PEER) program[11] to transform engineering and technical education for the Nation's manufacturing workforce. The program supports foundational research associated with the design, development, and deployment of new online curricula for students and professionals. In FY 2019, eight awards, totaling over $10 million dollars, were made using Boeing funding. At the end of FY 2019, the ECR: PEER program hosted a Principal Investigators meeting. Representatives from institutions gave presentations about their projects and group discussions identified challenges and best practices associated with teaming with industrial partners, effective online education practices, and evaluating student learning. The Boeing Company, as part of its Women Make Us Better and Women in Leadership Initiatives, also partnered with the NSF INCLUDES[12] program to support the re-entry of women and women Veterans in the STEM workforce.

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[11] https://www.nsf.gov/pubs/2019/nsf19557/nsf19557.htm
[12] https://www.nsf.gov/pubs/2019/nsf19038/nsf19038.jsp

The FAA Air Transportation Center of Excellence for Unmanned Aircraft Systems partnered with five universities to conduct STEM outreach for K-12 students and educators. The objective of this program was to expand the potential STEM outreach approaches of the FAA that use unmanned aircraft systems as the central learning platform. These unique approaches by the five university partners were tailored to their community needs in locations across the country and offered activities in both formal and informal education settings.

Conclusion

Since the release of *Charting a Course for Success: America's Strategy for STEM Education* in December 2018, significant steps have been taken to implement the Strategic Plan.

Interagency working groups, comprised of participants from FC-STEM agencies, have improved collaboration, coordination, and dissemination of Federal STEM education efforts. In many cases, input was gathered from internal and external stakeholders regarding evidence-based practices in order to integrate these practices and disseminate them for broader reach. FC-STEM understands the importance of stewardship of STEM education funding to ensure the uniqueness and effectiveness of Federal programs that meet the needs of diverse populations.

The goals and pathways outlined in the 5-year Federal STEM Education Strategic Plan have provided a course toward a future in which all Americans will have lifelong access to high-quality STEM education and the United States will remain the global leader in STEM literacy, innovation, and employment.

Appendix 1. FY 2020-Enacted Inventory of STEM Education Investments

Below is a list of STEM education investments and funding levels provided by OMB's 2020 data call on Federal STEM education programs. Programs were included if they had any funding in FY 2019 or FY 2020.

Agency	Sub-Agency/ Office	Program Name	FY 2019 Actual ($, millions)	FY 2020 Estimated ($, millions)	FY 2021 President's Budget ($, millions)
CNCS		CNCS STEM Programs	70.5	90.2	0.0
DHS	CWMD	National Nuclear Forensics Expertise Development Program	2.6	2.6	0.0
DHS	S&T	Educational Programs - Minority Serving Institutions	3.4	3.4	3.4
DOC	EDA	STEM Apprenticeship Pilot Program	0.0	2.0	0.0
DOC	NIST	NIST Summer Institute for Middle School Teachers	0.1	0.3	0.3
DOC	NIST	STEM Pipeline for the Next Generation Scientists and Engineers.	0.9	1.0	1.0
DOC	NIST	Summer Undergraduate Research Fellowship (SURF)	0.7	0.8	0.8
DOC	NOAA	Competitive Education Grants (including Environmental Literacy Grants)	2.8	3.1	0.0
DOC	NOAA	Dr. Nancy Foster Scholarship Program	0.6	0.6	0.6
DOC	NOAA	José E. Serrano Educational Partnership Program with Minority Serving Institutions	16.0	17.2	0.0
DOC	NOAA	Ernest F. Hollings Undergraduate Scholarship Program	5.7	5.4	4.6
DOC	NOAA	Margaret A. Davidson Graduate Research Fellowship	0.0	1.8	0.0
DOC	NOAA	National Sea Grant College Program	1.7	1.7	0.0
DOC	NOAA	NOAA Bay Watershed Education and Training (B-WET)	7.5	7.8	0.0
DOC	NOAA	NOAA Teacher at Sea Program	0.6	0.6	0.6
DOC	NOAA	Office of Ocean Exploration Education Programs	0.6	0.6	0.3
DOD	AFRL	Air Force STEM/Legacy Program	4.4	4.6	4.6
DOD	DTRA	Joint Science and Technology Institute	1.4	1.5	0.0
DOD	DTRA	Naval Research Laboratory Faculty Student Internship	0.4	0.5	0.0
DOD	MDA	MDA STEM Education Development (STEM ED)	0.1	0.1	0.1
DOD	ODASA(R&T)	Army Educational Outreach Program (AEOP)	9.6	10.2	10.4
DOD	ONR	Navy - Science and Engineering Apprenticeship Program (SEAP)	1.1	0.0	0.0
DOD	ONR	Navy Historically Black Colleges and Universities/Minority Institutions Research and Education Partnership	0.2	0.0	0.0
DOD	ONR	The Naval Research Enterprise Intern Program (NREIP)	4.2	0.0	0.0
DOD	OUSD(R&E)	National Defense Education Program (NDEP) K-12 component	41.8	46.6	21.1

Agency	Sub-Agency/ Office	Program Name	FY 2019 Actual ($, millions)	FY 2020 Estimated ($, millions)	FY 2021 President's Budget ($, millions)
DOD	OUSD(R&E)	National Defense Education Program (NDEP) Manufacturing Engineering Education Program (MEEP)	15.0	15.0	0.0
DOD	OUSD(R&E)	National Defense Education Program (NDEP) Military Child STEM Educational Programs	11.3	11.5	0.0
DOD	OUSD(R&E)	National Defense Education Program (NDEP) Science, Mathematics And Research for Transformation (SMART)	64.9	71.0	77.1
DOD	OUSD(R&E)	National Defense Science and Engineering Graduate (NDSEG) Fellowship Program	39.4	45.0	45.0
DOD	P&R, M&RA	DoD STARBASE Program1	30.0	35.0	0.0
DOE	ED	Minority Educational Institution Student Partnership Program	1.0		
DOE	EERE	Advanced Manufacturing Consortia	2.0	2.0	0.4
DOE	EERE	Industrial Assessment Centers	10.0	12.0	0.0
DOE	EERE	Land Grant University Graduate Education FOA	0.0	19.0	0.0
DOE	EERE	Manufacturing Demonstration Facility	1.0	0.3	0.2
DOE	EERE	Wide Bandgap Power Electronics Traineeship	3.5	0.0	0.0
DOE	EERE	Bioeconomy Education & Workforce Development Activities	0.1	3.5	0.0
DOE	EERE	Buildings Workforce Development Activities	1.0	2.2	0.0
DOE	EERE	Solar Decathlon	2.5	2.0	0.0
DOE	EERE	FEMP Online Training Program	0.8	0.0	0.3
DOE	EERE	Frontier Observatory for Research in Geothermal Energy (FORGE)	0.3	0.3	0.0
DOE	EERE	H2 & FC STEM and Workforce Training	0.3	2.0	0.3
DOE	EERE	FY18 FOA Subtopic: Digital Adaptation Training for Distributed Energy Resources on the Grid	6.0	0.0	0.0
DOE	EERE	Solar Ready Vets	1.0	1.0	0.0
DOE	EERE	Workforce FOA	0.0	2.0	0.0
DOE	EERE	Advanced Vehicle Competitions	2.5	3.0	1.0
DOE	EERE	Collegiate Wind Competition	0.4	1.3	0.1
DOE	EERE	Data Sharing and Analysis	0.0	1.0	0.0
DOE	EERE	Graduate Student Fellowships	0.5	0.5	0.0
DOE	EERE	STEM/Workforce (e.g. Incubators)	0.9	0.9	0.0
DOE	EERE	University Research Coordination	0.1	0.2	0.0
DOE	EERE	Wind for Schools	1.1	1.0	0.1
DOE	EERE	Training and Technical Assistance	3.0	0.0	0.0
DOE	EERE	Marine Energy Collegiate Competition	0.5	0.0	0.0
DOE	EM	HBCU Mathematics, Science & Technology, Engineering and Research Workforce Development Program	6.0	6.0	6.0
DOE	FE	Special Recruitment Programs/Mickey Leland Fellowship	0.7	0.7	0.9
DOE	NE	Integrated University Program	5.0	5.0	0.0

Agency	Sub-Agency/ Office	Program Name	FY 2019 Actual ($, millions)	FY 2020 Estimated ($, millions)	FY 2021 President's Budget ($, millions)
DOE	NNSA	Computational Sciences Graduate Fellowship (CSGF)	2.0	2.0	2.0
DOE	NNSA	Stewardship Science Academic Alliances (SSAA) Grants and Cooperative Agreements	33.4	25.0	25.0
DOE	NNSA, EM	Minority Serving Institution Partnership Program (MSIPP)	20.0	26.0	25.0
DOE	OEERE	Algae Technology Educational Consortium	0.5	0.5	0.0
DOE	SC	Computational Sciences Graduate Fellowship	10.0	10.0	10.0
DOE	SC	American Chemical Society Summer School in Nuclear and Radiochemistry	0.4	0.6	0.6
DOE	SC	Community College Internship	1.0	1.7	1.1
DOE	SC	National Science Bowl	2.9	2.9	2.9
DOE	SC	Office of Science Graduate Student Research Program	3.5	4.5	2.6
DOE	SC	Science Undergraduate Laboratory Internships	10.3	13.6	9.1
DOE	SC	Visiting Faculty Program	1.7	2.0	1.7
DOE	SC	U.S. Particle Accelerator Training	1.0	1.0	0.9
DOI	USGS	EDMAP	0.5	0.5	0.4
DOL	ETA	H-1B Training Activities	73.6	40.0	40.0
DOT	FAA	Air Transportation Centers of Excellence (COE)	24.4	61.3	32.0
DOT	FHWA	Dwight David Eisenhower Transportation Fellowship Program	1.8	2.0	2.0
DOT	FHWA	Garrett A. Morgan Technology and Transportation Education Program	0.0	0.4	0.4
DOT	FHWA	National Summer Transportation Institute Program (NSTI)	2.4	2.7	2.7
DOT	FHWA	Summer Transportation Institute Program for Diverse Groups (STIPDG)	0.8	1.3	1.3
DOT	FHWA	University Transportation Centers (UTC) Program	69.8	77.5	77.5
ED	IES	Regional Educational Laboratories	3.6	3.1	1.7
ED	IES	Research in Special Education	8.3	11.9	15.8
ED	IES	Research, Development, and Dissemination	39.3	37.3	31.1
ED	OESE	21st Century Community Learning Centers	3.6	0.0	0.0
ED	OESE	Investing in Innovation (now called Education Innovation and Research (EIR)	78.0	65.0	0.0
ED	OPE	Developing Hispanic Serving Institutions STEM and articulation programs	93.8	94.1	0.0
ED	OPE	Graduate Assistance in Areas of National Need (GAANN)	23.1	23.1	0.0
ED	OPE	Minority Science and Engineering Improvement Program	11.1	12.6	150.0
ED	OPE	Strengthening Predominantly Black Institutions	7.5	7.5	0.0
ED	OPE	Teacher Loan Forgiveness	105.4	107.5	109.6
ED	OPE	Upward Bound Math and Science Program	63.5	65.5	65.5
EPA	EE	Environmental Education Grants	3.3	3.3	0.0

Agency	Sub-Agency/ Office	Program Name	FY 2019 Actual ($, millions)	FY 2020 Estimated ($, millions)	FY 2021 President's Budget ($, millions)
EPA	EE	National Environmental Education and Training Partnership	2.2	2.1	0.0
EPA	ORD	P3-People, Prosperity & the Planet-Award: A National Student Design Competition for Sustainability	1.1	1.2	0.0
HHS	HRSA	Health Careers Opportunity Program	14.1	15.0	0.0
HHS	NIH	NIH Big Data to Knowledge (BD2K) Enhancing Diversity in Biomedical Data Science	1.4	1.5	1.4
HHS	NIH	Research Supplements to Promote Diversity in Health-Related Research	43.0	43.0	43.0
HHS	NIH	Ruth L. Kirschstein National Research Service Award Institutional Research Training Grants (T32, T35)	303.4	317.0	294.7
HHS	NIH	Ruth L. Kirschstein NRSA for Individual Predoctoral Fellows, including Underrepresented Racial/Ethnic Groups, Students from Disadvantaged Backgrounds, and Predoctoral Students with Disabilities	100.2	108.2	101.6
HHS	NIH	Summer Research Education Experience Programs	6.4	7.5	7.6
HHS	NIH	Team-Based Design in Biomedical Engineering Education	0.7	0.7	0.7
HHS	NIH	Graduate Program Partnerships	13.2	12.1	12.3
HHS	NIH	Post-baccalaureate Intramural Research Training Award Program	53.7	58.5	59.6
HHS	NIH	Student Intramural Research Training Award Program	8.2	8.0	8.1
HHS	NIH	Undergraduate Scholarship Program for Individuals from Disadvantaged Backgrounds	4.2	4.2	3.9
HHS	NIH	Cancer Education Grants Program	20.5	26.9	25.5
HHS	NIH	Center for Cancer Research Cancer Interns	0.4	0.4	0.4
HHS	NIH	Center for Cancer Research Cancer/John Hopkins University Master of Science in Biotechnology Concentration in Molecular Targets and Drug Discovery Technologies	0.3	0.4	0.4
HHS	NIH	National Cancer Institute Cancer Education and Career Development Program	85.0	87.6	83.2
HHS	NIH	NCI Predoctoral to Postdoctoral Fellow Transition Award (F99 Portion Only)	1.9	1.8	1.8
HHS	NIH	NCI Youth Enjoy Science (YES) Research Education Grant (R25)	4.9	6.9	8.6
HHS	NIH	Werner H Kirsten Student Internship Program	0.5	0.5	0.5
HHS	NIH	Initiative for Maximizing Research Education in Genomics; Diversity Action Plan	3.4	3.9	3.8
HHS	NIH	Short-Term Research Education Program to Increase Diversity in Health-Related Research	5.2	5.3	5.3
HHS	NIH	Summer Institute for Training in Biostatistics	1.5	1.5	1.5
HHS	NIH	Aging Research Dissertation Awards to Increase Diversity	0.7	0.7	0.7

Agency	Sub-Agency/ Office	Program Name	FY 2019 Actual ($, millions)	FY 2020 Estimated ($, millions)	FY 2021 President's Budget ($, millions)
HHS	NIH	National Institute on Aging Medicine, Science, Technology, Engineering and Mathematics: Advancing Diversity in Aging Research (ADAR) through Undergraduate Education	3.6	4.2	3.8
HHS	NIH	Courses for Skill Development in Biomedical Big Data Science	0.3	0.3	0.3
HHS	NIH	Mathematics and Science Cognition and Learning (MSCL) Program	9.1	9.5	8.6
HHS	NIH	Short Courses in Population Research (Education Programs for Population Research R25)	0.7	0.7	0.7
HHS	NIH	Drug Abuse Dissertation Research	0.4	0.4	0.4
HHS	NIH	Research Education Grants for Statistical Training in the Genetics of Addiction	0.4	0.0	0.0
HHS	NIH	Training in Computational Neuroscience: From Biology to Model and Back Again (R90 portion only)	0.9	0.9	0.9
HHS	NIH	National Institute of Diabetes and Digestive and Kidney Diseases Research, Education Program Grants for Summer Research Experiences (R25)	2.2	2.3	2.1
HHS	NIH	Short-Term Research Experience for Underrepresented Persons (STEP-UP; R25)	1.4	1.4	1.3
HHS	NIH	Undergraduate Research Education Program (UP) to Enhance Diversity in Environmental Health Sciences	0.6	1.0	1.0
HHS	NIH	Bridges to the Baccalaureate Program	8.8	8.9	8.1
HHS	NIH	Bridges to the Doctorate	2.4	1.9	1.7
HHS	NIH	Initiative for Maximizing Student Development	18.5	15.9	12.2
HHS	NIH	MARC U-STAR NRSA Program	17.8	18.2	16.5
HHS	NIH	RISE (Research Initiative for Scientific Enhancement)	22.1	22.6	20.6
HHS	NIH	Science Education Partnership Award	21.1	21.5	19.6
HHS	NIH	Short Courses on Mathematical, Statistical, and Computational Tools for Studying Biological Systems	0.6	0.0	0.0
HHS	NIH	Medical Research Scholars Program	0.6	0.8	0.8
HHS	NIH	NIMHD Minority Health and Health Disparities International Research Training (T37)	3.2	3.2	2.9
HHS	NIH	Blueprint Program for Enhancing Neuroscience Diversity through Undergraduate Research Education Experiences	0.8	2.3	2.3
HHS	NIH	Diversity Research Education Grants in Neuroscience	0.0	0.0	0.0
HHS	NIH	National Library of Medicine Institutional Training Grants for Research Training in Biomedical Informatics and Data Science	10.9	11.9	11.1
HHS	NIH	NIH Building Infrastructure Leading to Diversity (BUILD) Initiative (RL5 portion only)	8.2	7.0	5.9
HHS	NIH	NIH Building Infrastructure Leading to Diversity (BUILD) Initiative (TL4 portion only)	12.7	14.9	12.4

Agency	Sub-Agency/ Office	Program Name	FY 2019 Actual ($, millions)	FY 2020 Estimated ($, millions)	FY 2021 President's Budget ($, millions)
HHS	NIH	Postbaccalaureate Research Education Program (PREP)	11.4	11.7	10.6
NASA	Office of STEM Engagement	MUREP	33.0	36.0	0.0
NASA	Office of STEM Engagement	NextGen STEM Project (NGS)	12.0	12.0	0.0
NASA	Office of STEM Engagement	Space Grant - National Space Grant College and Fellowship Program	44.0	48.0	0.0
NASA	SMD	GLOBE Program	6.0	6.0	6.5
NASA	SMD	SMD Science Activation Program	45.0	45.6	45.6
NRC	RES	Integrated University Program	14.8	16.0	0.0
NRC	SBCR	Minority Serving Institutions Program (MSIP)	0.7	0.0	0.0
NSF	CISE	CyberTraining	3.6	5.0	3.6
NSF	CISE, EHR, MPS	Harnessing the Data Revolution (HDR): Data Science Corps (DSC)	7.3	3.0	6.0
NSF	EHR	Advanced Technological Education (ATE)	66.5	75.0	71.0
NSF	EHR	Advancing Informal STEM Learning (AISL), formerly Informal Science Education (ISE)	62.5	62.5	55.8
NSF	EHR	Alliances for Graduate Education and the Professoriate (AGEP)	8.0	8.0	7.1
NSF	EHR	Cybercorps: Scholarship for Service (SFS)	55.3	55.0	52.1
NSF	EHR	Discovery Research PreK-12 (DR-K12)	88.2	95.0	89.9
NSF	EHR	EHR Core Research (ECR)	67.8	69.5	157.4
NSF	EHR	Excellence Awards in Science and Engineering (EASE)	5.6	4.3	3.8
NSF	EHR	Hispanic-Serving Institutions (HSI)	40.0	45.0	14.2
NSF	EHR	Historically Black Colleges and Universities Undergraduate Program (HBCU-UP)	35.0	35.0	31.2
NSF	EHR	Improving Undergraduate STEM Education (IUSE)	101.9	107.0	88.2
NSF	EHR	Innovative Technology Experiences for Students and Teachers (ITEST)	34.2	39.3	39.3
NSF	EHR	Louis Stokes Alliances for Minority Participation (LSAMP)	46.0	47.5	43.5
NSF	EHR	NSF Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES)	20.2	20.0	18.9
NSF	EHR	NSF Research Traineeships (NRT)	54.1	49.5	61.9
NSF	EHR	NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM)	114.8	117.8	117.8
NSF	EHR	Research Experiences for Undergraduates (REU)	91.1	83.1	73.6
NSF	EHR	Robert Noyce Scholarship (Noyce) Program	75.2	67.0	44.5
NSF	EHR	Tribal Colleges and Universities Program (TCUP)	15.0	15.0	12.5

Agency	Sub-Agency/ Office	Program Name	FY 2019 Actual ($, millions)	FY 2020 Estimated ($, millions)	FY 2021 President's Budget ($, millions)
NSF	EHR, CISE	Computer Science for All (CSforAll)	0.0	30.0	19.0
NSF	EHR, CISE	STEM+C Partnerships (Will be replaced with Computer Science for All)	64.4	0.0	0.0
NSF	EHR, OIA	Graduate Research Fellowship Program (GRFP)	284.5	284.5	275.3
NSF	ENG	Emerging Frontiers in Research and Innovation (EFRI) Research Experience and Mentoring (REM)	1.2	1.2	0.7
NSF	ENG, CISE	Research Experiences for Teachers (RET) in Engineering and Computer Science	10.8	6.3	5.4
NSF	OISE	International Research Experiences for Students (IRES)	12.0	13.0	12.3
SI		STEM Informal Education and Instruction	5.1	5.2	5.4
USDA		1890 STEM Scholars	0.7	0.7	0.3
USDA	APHIS	AgDiscovery	1.0	1.0	1.0
USDA	APHIS	Florida A&M University Vet Tech Program	0.3	0.3	0.3
USDA	NIFA	1890 Facilities Grant Program	19.7	20.5	19.7
USDA	NIFA	1890 Institutions Capacity Building Grants Program: Extension	6.4	7.6	6.4
USDA	NIFA	1890 Institutions Capacity Building Grants Program: Teaching	6.4	7.6	6.4
USDA	NIFA	1890 National Scholars Program	40.0	5.0	10.0
USDA	NIFA	4-H Science, 4-H Youth Development Program	26.6	26.6	26.6
USDA	NIFA	Agriculture in the Classroom	0.6	0.6	0.6
USDA	NIFA	Alaska Native-Serving and Native Hawaiian-Serving Institutions Education Competitive Grants Program	3.2	3.2	5.0
USDA	NIFA	Hispanic serving Institutions Education Grants Program	9.2	11.2	9.2
USDA	NIFA	Insular Programs	2.0	2.0	0.0
USDA	NIFA	Multicultural Scholars, Graduate Fellowship and Institution Challenge Grants	9.0	9.0	0.0
USDA	NIFA	NIFA Fellowship Grants Program	32.0	32.0	32.0
USDA	NIFA	Secondary Postsecondary Agriculture Education Challenge Grants (SPECA)	0.9	0.9	0.0
USDA	NIFA	Women and Minorities in Science, Technology, Engineering and Mathematics Fields Program (WAMS)	0.4	0.4	0.4
VA		Edith Nourse Rogers STEM Scholarship	0.0	75.0	75.0
VA		Veteran Employment Through Technology Education Courses (VET TEC)	1.4	28.6	15.0

Appendix 2. Summary of FY 2020 STEM Education Investments

This table provides a summary of all inventory data from **Appendix 1** by agency including total number of investments and FY2020 estimated budget.

Agency	Number of Investments	FY 2020 Estimated Budget ($, millions)
Corporation for National and Community Service	1	90.2
Department of Agriculture	16	128.6
Department of Commerce	13	42.9
Department of Defense	11	241.0
Department of Education	10	427.6
Department of Energy	33	155.7
Department of Health and Human Services	43	785.5
Department of Homeland Security	2	6.0
Department of Labor	1	40.0
Department of the Interior	1	0.5
Department of Transportation	6	145.2
Environmental Protection Agency	3	6.6
National Aeronautics and Space Administration	5	147.6
National Science Foundation	25	1,338.5
Nuclear Regulatory Commission	1	16.0
Smithsonian Institution	1	5.2
Veterans Affairs	2	103.6
Grand Total	**174**	**3,680.7**

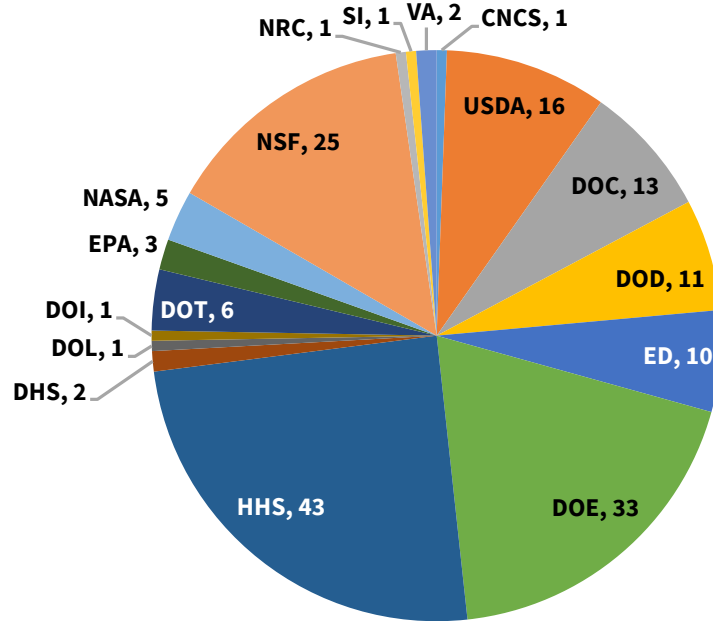**FY 2020 Number of STEM Education Investments Per Agency**

Figure 3. This pie chart depicts the information provided in the table above in the "Number of Investments" column.

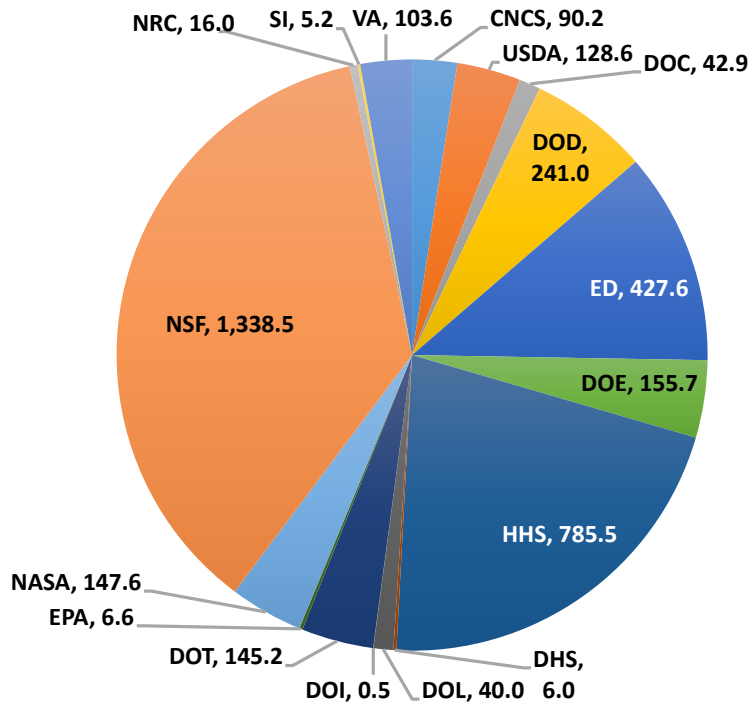**FY 2020 Estimated Budget ($, millions)**

Figure 4. This pie chart depicts the information provided in the table above in the FY2020 Estimated Budget column.

Appendix 3. Agency STEM Education Investment Alignment to Goals and Pathways

The information in the table below shares how each individual agency's investment aligns with the goals and pathways identified in the Strategic Plan. This information was collected by FC-STEM.

FC-STEM agencies were asked how investments aligned to the Federal STEM Education Strategic Plan goals and pathways. A "**D**" indicates that the major outcome of the STEM investment contributes directly to, or progress towards the attainment of the goal or pathway. An "**I**" indicates that the major outcome of the STEM investment contributes indirectly to the attainment of the goal or pathway, or the investment outcome supports the goal or pathway or progress towards the goal, but is not a stated goal or objective of the investment. A blank indicates that the anticipated outcomes of the investment are unlikely to contribute, directly or indirectly, to achieve the goal or pathway.

Agency	Sub-Agency/ Office	Program Name	Goal: Build strong foundations for STEM literacy	Goal: Increase diversity, equity and inclusion in STEM	Goal: Prepare the STEM workforce for the future	Pathway: Develop and enrich strategic partner-ships	Pathway: Engage students where disciplines converge	Pathway: Build computa-tional literacy
DOC	EDA	STEM Apprenticeship Pilot Program	D	D	D	D	D	D
DOC	NIST	NIST Summer Institute for Middle School Teachers	D	D	D	I	I	
DOC	NIST	STEM Pipeline for the Next Generation Scientists and Engineers.	D	D	D	D	D	I
DOC	NIST	Summer Undergraduate Research Fellowship (SURF)	D	D	D	I	D	I
DOC	NOAA	Competitive Education Grants (including Environmental Literacy Grants)	D			D		D
DOC	NOAA	Dr. Nancy Foster Scholarship Program		D		D		
DOC	NOAA	José E. Serrano Educational Partnership Program with Minority Serving Institutions		D	I	D		
DOC	NOAA	Ernest F. Hollings Undergraduate Scholarship Program		D		D		
DOC	NOAA	Margaret A. Davidson Graduate Research Fellowship			D	D	D	
DOC	NOAA	National Sea Grant College Program		I	D		D	
DOC	NOAA	NOAA Bay Watershed Education and Training (B-WET)	D	I		D	D	
DOC	NOAA	NOAA Teacher at Sea Program	D			D		
DOC	NOAA	Office of Ocean Exploration Education Programs	D	D	D	D	I	I
DOD	AFRL	Air Force STEM/Legacy Program	D	D	D	I	D	D

Agency	Sub-Agency/Office	Program Name	Goal: Build strong foundations for STEM literacy	Goal: Increase diversity, equity and inclusion in STEM	Goal: Prepare the STEM workforce for the future	Pathway: Develop and enrich strategic partner-ships	Pathway: Engage students where disciplines converge	Pathway: Build computa-tional literacy
DOD	DTRA	Joint Science and Technology Institute	D	D	D	D	D	D
DOD	DTRA	Naval Research Laboratory Faculty Student Internship	D	D	D	D	D	D
DOD	MDA	MDA STEM Education Development (STEM ED)	D	I	D	D	I	D
DOD	ODASA (R&T)	Army Educational Outreach Program (AEOP)	D	D	I	D	D	I
DOD	ONR	Navy - Science and Engineering Apprenticeship Program (SEAP)	D	I	D	I	I	I
DOD	ONR	Navy Historically Black Colleges and Universities/Minority Institutions Research and Education Partnership						
DOD	ONR	The Naval Research Enterprise Intern Program (NREIP)	D	I	D	I	I	I
DOD	OUSD (R&E)	National Defense Education Program (NDEP) K-12 component	D	D	D	D	D	D
DOD	OUSD (R&E)	National Defense Education Program (NDEP) Manufacturing Engineering Education Program (MEEP)	I		D	D	D	
DOD	OUSD (R&E)	National Defense Education Program (NDEP) Military Child STEM Educational Programs	D	D	D	D	D	D
DOD	OUSD (R&E)	National Defense Education Program (NDEP) Science, Mathematics And Research for Transformation (SMART)	I	I	D	I	I	I
DOD	OUSD (R&E)	National Defense Science and Engineering Graduate (NDSEG) Fellowship Program	D	D	D			
DOD	P&R, M&RA	DoD STARBASE Program1	D	D	D	D	D	D
DOE	DOE/ED	Minority Educational Institution Student Partnership Program		D	D	D		
DOE	EERE	Advanced Manufacturing Consortia				D	D	
DOE	EERE	Industrial Assessment Centers				D	D	
DOE	EERE	Land Grant University Graduate Education FOA				D	D	I
DOE	EERE	Manufacturing Demonstration Facility				D	D	
DOE	EERE	Wide Bandgap Power Electronics Traineeship				D	D	I

Agency	Sub-Agency/Office	Program Name	Goal: Build strong foundations for STEM literacy	Goal: Increase diversity, equity and inclusion in STEM	Goal: Prepare the STEM workforce for the future	Pathway: Develop and enrich strategic partnerships	Pathway: Engage students where disciplines converge	Pathway: Build computational literacy
DOE	EERE	Bioeconomy Education & Workforce Development Activities			D	D		I
DOE	EERE	Buildings Workforce Development Activities			D	D	I	
DOE	EERE	Solar Decathlon			D	D	I	
DOE	EERE	FEMP Online Training Program			D	D		D
DOE	EERE	Frontier Observatory for Research in Geothermal Energy (FORGE)			D	D	D	
DOE	EERE	H2 & FC STEM and Workforce Training			D			
DOE	EERE	FY18 FOA Subtopic: Digital Adaptation Training for Distributed Energy Resources on the Grid	I					
DOE	EERE	Solar Ready Vets			D		D	
DOE	EERE	Workforce FOA	I		D	D	I	
DOE	EERE	Advanced Vehicle Competitions			D		I	
DOE	EERE	Collegiate Wind Competition			D	D	I	
DOE	EERE	Data Sharing and Analysis			D	D	I	D
DOE	EERE	Graduate Student Fellowships			D	D	D	
DOE	EERE	STEM/Workforce (e.g. Incubators)			D	D	D	
DOE	EERE	University Research Coordination			D	D		
DOE	EERE	Wind for Schools	I		D	D	I	
DOE	EERE	Training and Technical Assistance			D	D	I	
DOE	EERE	Marine Energy Collegiate Competition			D	D	D	D
DOE	EM	HBCU Mathematics, Science & Technology, Engineering and Research Workforce Development Program		D	D	D		
DOE	FE	Special Recruitment Programs/Mickey Leland Fellowship		D	D	D		
DOE	NE	Integrated University Program			D	D	I	
DOE	NNSA	Computational Sciences Graduate Fellowship (CSGF)			D	I	I	D
DOE	NNSA	Stewardship Science Academic Alliances (SSAA) Grants and Cooperative Agreements			D	D	I	I

Agency	Sub-Agency/Office	Program Name	Goal: Build strong foundations for STEM literacy	Goal: Increase diversity, equity and inclusion in STEM	Goal: Prepare the STEM workforce for the future	Pathway: Develop and enrich strategic partner-ships	Pathway: Engage students where disciplines converge	Pathway: Build computa-tional literacy
DOE	NNSA, EM	Minority Serving Institution Partnership Program (MSIPP)	I	D	D	D	I	I
DOE	OEERE	Algae Technology Educational Consortium			D	D		I
DOE	SC	Computational Sciences Graduate Fellowship						
DOE	SC	American Chemical Society Summer School in Nuclear and Radiochemistry			D		D	
DOE	SC	Community College Internship		I	D	D	I	
DOE	SC	National Science Bowl	D			D	I	
DOE	SC	Office of Science Graduate Student Research Program			D	D	I	I
DOE	SC	Science Undergraduate Laboratory Internships			D	D	I	I
DOE	SC	Visiting Faculty Program		D	D	D	I	
DOE	SC	U.S. Particle Accelerator Training			D	I	D	
DOI	USGS	EDMAP		I	D			
DOL	ETA	H-1B Training Activities	I	I	I	I		I
DOT	FAA	Air Transportation Centers of Excellence (COE)	D	D	D	D	D	I
DOT	FHWA	Dwight David Eisenhower Transportation Fellowship Program	D	D	D	D	D	I
DOT	FHWA	Garrett A. Morgan Technology and Transportation Education Program	D	D	D	I	D	I
DOT	FHWA	National Summer Transportation Institute Program (NSTI)	D	D	D	D	D	I
DOT	FHWA	Summer Transportation Institute Program for Diverse Groups (STIPDG)	D	D	D	D	D	I
DOT	FHWA	University Transportation Centers (UTC) Program	D	D	D	D	D	I
ED	IES	Regional Educational Laboratories	I	I		I		
ED	IES	Research in Special Education	I	I	I	I	I	
ED	IES	Research, Development, and Dissemination	I	I	I	I	I	I
ED	OESE	21st Century Community Learning Centers	I	I		D	I	I
ED	OESE	Investing in Innovation (now called Education Innovation and Research (EIR)	D	I	D	I	D	D
ED	OPE	Developing Hispanic Serving Institutions STEM and articulation programs		D	D			

Agency	Sub-Agency/ Office	Program Name	Goal: Build strong foundations for STEM literacy	Goal: Increase diversity, equity and inclusion in STEM	Goal: Prepare the STEM workforce for the future	Pathway: Develop and enrich strategic partner-ships	Pathway: Engage students where disciplines converge	Pathway: Build computa-tional literacy
ED	OPE	Graduate Assistance in Areas of National Need (GAANN)			D			I
ED	OPE	Minority Science and Engineering Improvement Program		D	D	I	I	
ED	OPE	Strengthening Predominantly Black Institutions		D	D			
ED	OPE	Teacher Loan Forgiveness	I		I		I	I
ED	OPE	Upward Bound Math and Science Program	D	D	D	I		
EPA	EE	Environmental Education Grants	D	I	I	I	D	D
EPA	EE	National Environmental Education and Training Partnership	D	D	I	D	I	I
EPA	ORD	P3-People, Prosperity & the Planet-Award: A National Student Design Competition for Sustainability	D	D	D	D	D	D
HHS	HRSA	Health Careers Opportunity Program						
HHS	NIH	NIH Big Data to Knowledge (BD2K) Enhancing Diversity in Biomedical Data Science		D	D			D
HHS	NIH	Research Supplements to Promote Diversity in Health-Related Research		D	D			
HHS	NIH	Ruth L. Kirschstein National Research Service Award Institutional Research Training Grants (T32, T35)		I	D		I	
HHS	NIH	Ruth L. Kirschstein NRSA for Individual Predoctoral Fellows, including Underrepresented Racial/Ethnic Groups, Students from Disadvan-taged Backgrounds, and Predoctoral Students with Disabilities		D	D			
HHS	NIH	Summer Research Education Experience Programs		I	D			
HHS	NIH	Team-Based Design in Biomedical Engineering Education		I	D			D
HHS	NIH	Graduate Program Partnerships			D			
HHS	NIH	Post-baccalaureate Intramural Research Training Award Program			D			

Agency	Sub-Agency/Office	Program Name	Goal: Build strong foundations for STEM literacy	Goal: Increase diversity, equity and inclusion in STEM	Goal: Prepare the STEM workforce for the future	Pathway: Develop and enrich strategic partnerships	Pathway: Engage students where disciplines converge	Pathway: Build computational literacy
HHS	NIH	Student Intramural Research Training Award Program			D			
HHS	NIH	Undergraduate Scholarship Program for Individuals from Disadvantaged Backgrounds		D	D			
HHS	NIH	Cancer Education Grants Program		I	D			
HHS	NIH	Center for Cancer Research Cancer Interns		D	D			
HHS	NIH	Center for Cancer Research Cancer/John Hopkins University Master of Science in Biotechnology Concentration in Molecular Targets and Drug Discovery Technologies			D			
HHS	NIH	National Cancer Institute Cancer Education and Career Development Program		I	D			
HHS	NIH	NCI Predoctoral to Postdoctoral Fellow Transition Award (F99 Portion Only)			D			
HHS	NIH	NCI Youth Enjoy Science (YES) Research Education Grant (R25)	D	D	D			
HHS	NIH	Werner H Kirsten Student Internship Program			D			
HHS	NIH	Initiative for Maximizing Research Education in Genomics; Diversity Action Plan		D	D			
HHS	NIH	Short-Term Research Education Program to Increase Diversity in Health-Related Research		D	D			
HHS	NIH	Summer Institute for Training in Biostatistics			D			D
HHS	NIH	Aging Research Dissertation Awards to Increase Diversity		D	D			
HHS	NIH	National Institute on Aging Medicine, Science, Technology, Engineering and Mathematics: Advancing Diversity in Aging Research (ADAR) through Undergraduate Education		D	D			
HHS	NIH	Courses for Skill Development in Biomedical Big Data Science		I	D			D

Agency	Sub-Agency/Office	Program Name	Goal: Build strong foundations for STEM literacy	Goal: Increase diversity, equity and inclusion in STEM	Goal: Prepare the STEM workforce for the future	Pathway: Develop and enrich strategic partner-ships	Pathway: Engage students where disciplines converge	Pathway: Build computa-tional literacy
HHS	NIH	Mathematics and Science Cognition and Learning (MSCL) Program	D					D
HHS	NIH	Short Courses in Population Research (Education Programs for Population Research R25)		I	D			
HHS	NIH	Drug Abuse Dissertation Research		D	D			
HHS	NIH	Research Education Grants for Statistical Training in the Genetics of Addiction		I	D			
HHS	NIH	Training in Computational Neuroscience: From Biology to Model and Back Again (R90 portion only)		I	D			D
HHS	NIH	National Institute of Diabetes and Digestive and Kidney Diseases Research, Education Program Grants for Summer Research Experiences (R25)		I	D			
HHS	NIH	Short-Term Research Experience for Underrepresented Persons (STEP-UP; R25)		D	D			
HHS	NIH	Undergraduate Research Education Program (UP) to Enhance Diversity in Environmental Health Sciences		D	D			
HHS	NIH	Bridges to the Baccalaureate Program		D	D			
HHS	NIH	Bridges to the Doctorate		D	D			
HHS	NIH	Initiative for Maximizing Student Development		D	D			
HHS	NIH	MARC U-STAR NRSA Program		D	D			
HHS	NIH	RISE (Research Initiative for Scientific Enhancement)		D	D			
HHS	NIH	Science Education Partnership Award	D	I				
HHS	NIH	Short Courses on Math-ematical, Statistical, and Computational Tools for Studying Biological Systems		I	D			D
HHS	NIH	Medical Research Scholars Program			D			
HHS	NIH	NIMHD Minority Health and Health Disparities International Research Training (T37)		D	D			
HHS	NIH	Blueprint Program for Enhancing Neuroscience Diversity through Undergraduate Research Education Experiences		D	D			

Agency	Sub-Agency/Office	Program Name	Goal: Build strong foundations for STEM literacy	Goal: Increase diversity, equity and inclusion in STEM	Goal: Prepare the STEM workforce for the future	Pathway: Develop and enrich strategic partnerships	Pathway: Engage students where disciplines converge	Pathway: Build computational literacy
HHS	NIH	Diversity Research Education Grants in Neuroscience		D	D			
HHS	NIH	National Library of Medicine Institutional Training Grants for Research Training in Biomedical Informatics and Data Science		I	D			D
HHS	NIH	NIH Building Infrastructure Leading to Diversity (BUILD) Initiative (RL5 portion only)		D	D			
HHS	NIH	NIH Building Infrastructure Leading to Diversity (BUILD) Initiative (TL4 portion only)		D	D			
HHS	NIH	Postbaccalaureate Research Education Program (PREP)		D	D			
NASA	Office of STEM Engagement	MUREP	I	D	D	I	D	
NASA	Office of STEM Engagement	NextGen STEM Project (NGS)	I	I	D	D	I	I
NASA	Office of STEM Engagement	Space Grant - National Space Grant College and Fellowship Program	D	I	D	D	D	
NASA	SMD	GLOBE Program	D	D	I	I	D	I
NASA	SMD	SMD Science Activation Program	D	D	I	D	D	I
NSF	CISE	CyberTraining	D	I	D	D	D	D
NSF	CISE, EHR, MPS	Harnessing the Data Revolution (HDR): Data Science Corps (DSC)	D	I	D	D	D	D
NSF	EHR	Advanced Technological Education (ATE)	D	D	D	D	D	D
NSF	EHR	Advancing Informal STEM Learning (AISL), formerly Informal Science Education (ISE)	D	D	I	D	D	I
NSF	EHR	Alliances for Graduate Education and the Professoriate (AGEP)		D	D	D	I	
NSF	EHR	Cybercorps: Scholarship for Service (SFS)	I	D	D		I	
NSF	EHR	Discovery Research PreK-12 (DR-K12)	D	D	I	I	D	D
NSF	EHR	EHR Core Research (ECR)	I	I	I	I	I	I

Agency	Sub-Agency/ Office	Program Name	Goal: Build strong foundations for STEM literacy	Goal: Increase diversity, equity and inclusion in STEM	Goal: Prepare the STEM workforce for the future	Pathway: Develop and enrich strategic partner-ships	Pathway: Engage students where disciplines converge	Pathway: Build computa-tional literacy
NSF	EHR	Excellence Awards in Science and Engineering (EASE)		I	I			
NSF	EHR	Hispanic-Serving Institutions (HSI)	D	D	D	D	D	I
NSF	EHR	Historically Black Colleges and Universities Undergraduate Program (HBCU-UP)	I	D	D	D	D	D
NSF	EHR	Improving Undergraduate STEM Education (IUSE)	D	D	D	D	D	D
NSF	EHR	Innovative Technology Experiences for Students and Teachers (ITEST)	D	D	D	D	I	I
NSF	EHR	Louis Stokes Alliances for Minority Participation (LSAMP)		D	D	D	D	I
NSF	EHR	NSF Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES)		D	I	D		
NSF	EHR	NSF Research Traineeships (NRT)		D	D		D	I
NSF	EHR	NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM)	I	D	D	I	I	I
NSF	EHR	Research Experiences for Undergraduates (REU)	I	I	D	I	I	
NSF	EHR	Robert Noyce Scholarship (Noyce) Program	D	D	D	I	D	D
NSF	EHR	Tribal Colleges and Universities Program (TCUP)		D	D	D	D	D
NSF	EHR, CISE	Computer Science for All (CSforAll)						
NSF	EHR, CISE	STEM+C Partnerships (Will be replaced with Computer Science for All)	D	D	D	I	D	D
NSF	EHR, OIA	Graduate Research Fellowship Program (GRFP)		D	D			
NSF	ENG	Emerging Frontiers in Research and Innovation (EFRI) Research Experience and Mentoring (REM)		D	D	D	I	
NSF	ENG, CISE	Research Experiences for Teachers (RET) in Engineering and Computer Science	D	D	D	D	D	D
NSF	OISE	International Research Experiences for Students (IRES)		I	D	I	I	

Agency	Sub-Agency/ Office	Program Name	Goal: Build strong foundations for STEM literacy	Goal: Increase diversity, equity and inclusion in STEM	Goal: Prepare the STEM workforce for the future	Pathway: Develop and enrich strategic partner-ships	Pathway: Engage students where disciplines converge	Pathway: Build computa-tional literacy
SI		STEM Informal Education and Instruction	D	D	D	D	D	I
USDA		1890 STEM Scholars	D	D	D		I	I
USDA	APHIS	AgDiscovery	D		D	D	D	I
USDA	APHIS	Florida A&M University Vet Tech Program	D	D	D	D	I	I
USDA	NIFA	1890 Facilities Grant Program	D	D	D		I	I
USDA	NIFA	1890 Institutions Capacity Building Grants Program: Extension		I		D		
USDA	NIFA	1890 Institutions Capacity Building Grants Program: Teaching	D	D	D		I	I
USDA	NIFA	1890 National Scholars Program						
USDA	NIFA	4-H Science, 4-H Youth Development Program	D	I	D	I		
USDA	NIFA	Agriculture in the Classroom	D		D	D	I	
USDA	NIFA	Alaska Native-Serving and Native Hawaiian-Serving Institutions Education Competitive Grants Program	D	D	D			
USDA	NIFA	Hispanic serving Institutions Education Grants Program	D	D	D			
USDA	NIFA	Insular Programs	D	I	D	D		I
USDA	NIFA	Multicultural Scholars, Graduate Fellowship and Institution Challenge Grants	D	D	D	D	I	I
USDA	NIFA	NIFA Fellowship Grants Program	D		D		I	I
USDA	NIFA	Secondary Postsecondary Agriculture Education Challenge Grants (SPECA)	D	D	D		I	I
USDA	NIFA	Women and Minorities in Science, Technology, Engineering and Mathematics Fields Program (WAMS)	D	D	D	D	I	
VA		Edith Nourse Rogers STEM Scholarship	D	D	D	D	I	D
VA		Veteran Employment Through Technology Education Courses (VET TEC)	D	D	D	D	D	D

Appendix 4. Agency STEM Education Implementation Actions Alignment to Pathways and Objectives

GOALS FOR AMERICAN STEM EDUCATION ★ Build Strong Foundations for STEM Literacy ★ ★ Increase Diversity, Equity, and Inclusion in STEM ★ ★ Prepare the STEM Workforce for the Future ★														
Pathways	**Objectives**	DOC	DOD	DOE	DOI	DOL	DOS	DOT	ED	EPA	HHS	NASA	NSF	SI	USDA
Develop and Enrich Strategic Partnerships	Foster STEM Ecosystems that Unite Communities	●	●	●	●		●	●	●	●	●	●	●	●	●
	Increase Work-Based Learning and Training through Educator-Employer Partnerships	●	●	●	●	●		●	●	●	●	●	●		●
	Blend Successful Practices from Across the Learning Landscape	●	●	●			●	●	●				●	●	●
Engage Students where Disciplines Converge	Advance Innovation and Entrepreneurship Education	●	●	●			●	●	●	●	●		●		●
	Make Mathematics a Magnet	●	●	●					●				●		●
	Encourage Transdisciplinary Learning	●	●	●	●			●	●		●	●	●	●	●
Build Computational Literacy	Promote Digital Literacy and Cyber Safety	●	●				●		●		●		●		●
	Make Computational Thinking an Integral Element of All Education	●	●	●	●				●		●		●	●	●
	Expand Digital Platforms for Teaching and Learning	●		●					●	●			●	●	●
Operate with Transparency and Accountability	Leverage and Scale Evidence-Based Practices Across STEM Communities	▬▬▬													
	Report Participation Rates of Underrepresented Groups	▬▬▬													
	Use Common Metrics to Measure Progress	▬▬▬													
	Make Program Performance and Outcomes Publicly Available	▬▬▬													
	Develop a Federal Implementation Plan and Track Progress	▬▬▬													