2022 PROGRESS REPORT ON THE IMPLEMENTATION OF THE FEDERAL SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM) EDUCATION STRATEGIC PLAN

A Report by the

WHITE HOUSE OFFICE OF SCIENCE AND TECHNOLOGY POLICY

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The Committee on STEM Education (CoSTEM) 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, the Committee 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 STEM education strategic plan, to be updated every five years. The Federal Coordination in STEM Education (FC-STEM) is a subcommittee of the NSTC Committee on STEM Education (CoSTEM). 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 an update on the Federal activities that occurred from March 2021 to March 2022. This progress report includes: a summary of CoSTEM progress on the implementation of the STEM strategy, a description of the ways Federal agencies work together to address common challenges, and an inventory of Federal STEM education programs. The annual report includes actual investments for FY2021, estimated investments for FY2022, and requested funding levels for FY2023.

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Abbreviations and Acronyms

AEOP	DOD Army Educational Outreach Program
AFRL	DOD Air Force Research Laboratory
APHIS	USDA Animal and Plant Health Inspection Service
CCLC	21st Century Community Learning Centers Program
CISE	NSF Directorate for Computing and Information Science and Engineering
CNCS	Corporation for National Community Service
COE	FAA Air Transportation Center of Excellence
CoSTEM	Committee on STEM Education
CWMD	DHS Countering Weapons of Mass Destruction
DAF	DOD Department of Air Force
DHS	Department of Homeland Security
DOC	Department of Commerce
DOD	Department of Defense
DOE	Department of Energy
DOE/ED	DOE Office of Economic Impact and Diversity
DOI	Department of the Interior
DOL	Department of Labor
DOS	Department of State
DOT	Department of Transportation
DSEC	Defense Science Technology Engineering and Mathematics Education Consortium
DTRA	DOD Defense Threat Reduction Agency
EASE	NSF Excellence Awards in Science and Engineering
ECR	NSF EDU Core Research
ED	Department of Education
EDA	DOC Economic Development Administration
EDMAP	USGS Educational Mapping Program

EE	EPA Office of Environmental Education
EERE	DOE Office of Energy Efficiency and Renewable Energy
EDU	NSF Directorate for STEM Education (Formerly EHR - Directorate for Education and Human Resources)
EM	DOE Office of Environmental Management
ENG	NSF Directorate for Engineering
EPA	U.S. Environmental Protection Agency
ETA	DOL Employment and Training Administration
FAA	DOT Federal Aviation Administration
FC-STEM	Federal Coordination in STEM Education Subcommittee
FDA	Food and Drug Administration
FE	DOE Office of Fossil Energy
FEMP	DOE Federal Energy Management Program
FHWA	DOT Federal Highway Administration
HBCU-UP	NSF Historically Black Colleges and Universities – Undergraduate Program
HHS	Department of Health and Human Services
HRSA	HHS Health Resources & Services Administration
HUD	Department of Housing and Urban Development
IES	ED Institute of Education Sciences
IMLS	Institute of Museum and Library Services
IT	Information Technology
IWG	Interagency Working Group
MDA	DOD Missile Defense Agency
MPS	NSF Directorate for Mathematical and Physical Sciences
MSI	Minority-Serving Institution

MUREP	NASA Minority University Research and Education Project		**ONR**	DOD Office of Naval Research
			OPE	ED Office of Postsecondary Education
NASA	National Aeronautics and Space Administration		**ORD**	EPA Office of Research and Development
NCEAI	National Council for Expanding American Innovation		**OSTP**	Office of Science and Technology Policy
NE	DOE Office of Nuclear Energy		**OUSDRE**	Office of the Under Secretary of Defense for Research and Engineering
NIFA	USDA National Institute of Food and Agriculture			
NIH	National Institutes of Health		**P&R/M&RA**	DOD Personnel & Readiness/ Manpower & Reserve Affairs
NIHF	National Inventors Hall of Fame		**PPP**	Public-private partnerships
NIST	National Institute of Standards and Technology		**R&D**	Research and development
			RES	NRC Office of Nuclear Regulatory Research
NNSA	DOE National Nuclear Security Administration		**RFI**	Request for Information
NOAA	National Oceanic and Atmospheric Administration		**S&T**	Science and Technology
			SBCR	NRC Small Business and Civil Rights Office
NPS	National Park Service			
NSA	DOD National Security Agency		**SBIR**	Small Business Innovation Research Program
NRC	Nuclear Regulatory Commission		**SC**	DOE Office of Science
NSF	National Science Foundation		**SI**	Smithsonian Institution
NSF INCLUDES	NSF's Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science Initiative (Renamed Eddie Bernice Johnson INCLUDES Initiative, Fall 2022)		**SMD**	NASA Science Mission Directorate
			STEM	Science, technology, engineering, and mathematics
			STTR	Small Business Technology Transfer Program
			TCU	Tribal College and University
NSTC	National Science and Technology Council		**TCUP**	NSF Tribal Colleges and Universities Program
ODASART	Office of the Deputy Assistant Secretary of the Army for Research & Technology		**U.S.**	United States
			USDA	United States Department of Agriculture
OESE	ED Office of Elementary and Secondary Education		**USGS**	United States Geological Survey
OIA	NSF Office of Integrative Activities		**USPTO**	United States Patent and Trademark Office
OISE	NSF Office of International Science and Engineering		**VA**	Department of Veterans Affairs
OMB	Office of Management and Budget			

Introduction

Science, technology, engineering, and mathematics (STEM) are the foundation for discovery and 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. A focus on diversity, equity, inclusion, and accessibility in STEM requires attention to opportunities across education and career pathways. This effort is especially important for those who are 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 strengthens America's economic and national security.

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.

Federal agencies engaged in STEM education are 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 STEM education investments during Fiscal Year (FY) 2021. Additionally, this document fulfills the requirement under Section 101(d) of the *America COMPETES Reauthorization Act of 2010*)[2] that the Office of Science and Technology Policy (OSTP) transmit an annual report to Congress providing an update on the performance of the Federal STEM education portfolio and an inventory of Federal STEM education investments.

The 2018 Five-Year Federal STEM Education Strategic Plan

The 2018 Strategic Plan presented a vision for 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.

The Strategic Plan focused on three overarching goals:[3]

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 by providing all Americans with lifelong access to high-quality STEM education, especially those historically underrepresented and underserved in STEM fields and employment.

Prepare the STEM Workforce for the Future by creating authentic learning experiences—for both college-educated STEM practitioners and those working in skilled trades that do not require a four-year degree—that encourage and prepare learners to pursue STEM careers.

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[1] Charting a Course for Success: America's Strategy for STEM Education: https://trumpwhitehouse.archives.gov/wp-content/uploads/2018/12/STEM-Education-Strategic-Plan-2018.pdf

[2] 42 U.S.C. §6621(d): https://uscode.house.gov/view.xhtml?req=(title:42%20section:6621%20edition:prelim

[3] Overarching goals updated slightly in 2021
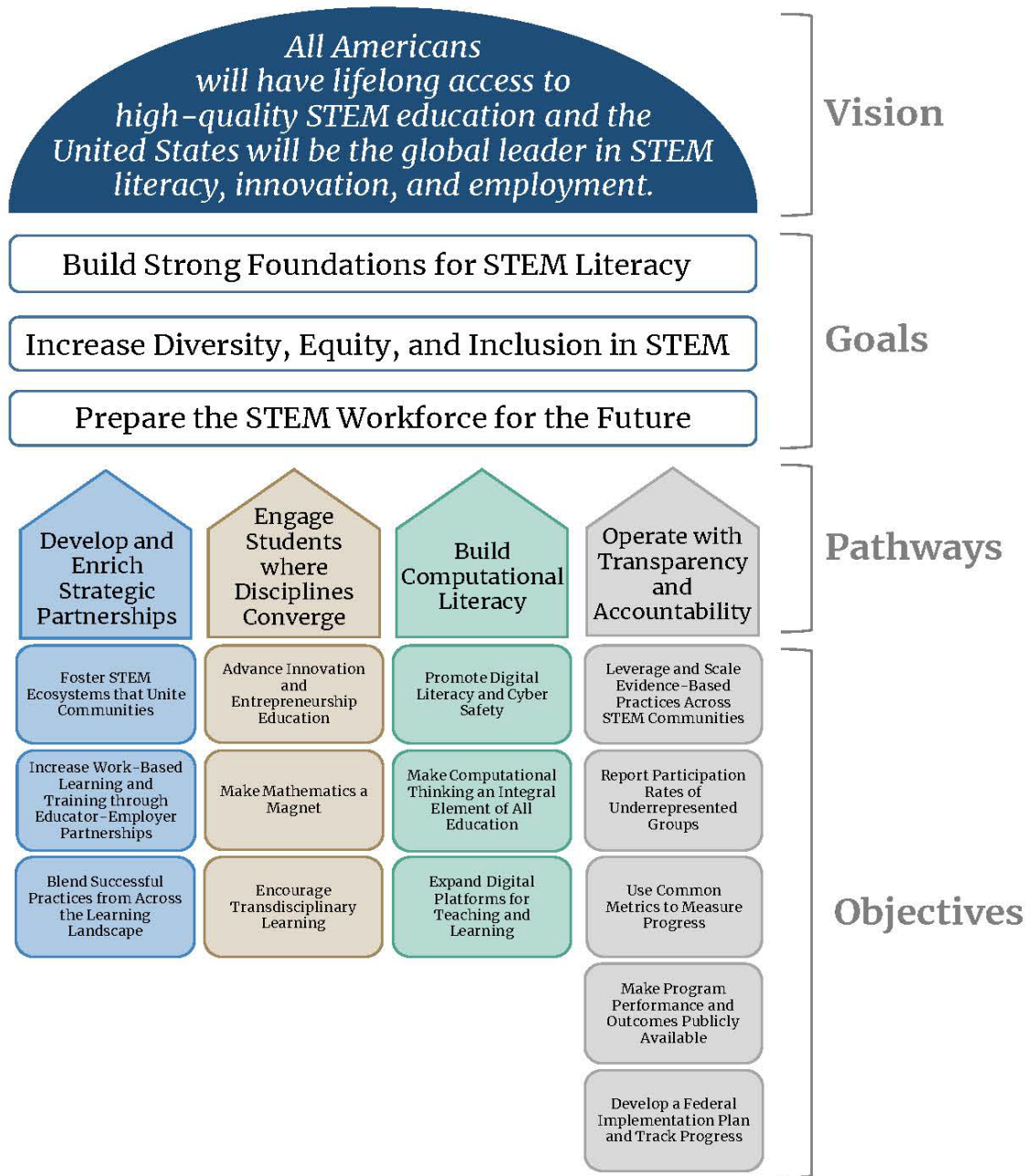
Figure 1. Schematic illustrating the organizational structure of the Federal STEM Education Strategic Plan released in December 2018. The Strategic Plan's vision is supported by three aspirational goals. Four pathways contain objectives to guide efforts by the Federal government, and the wider STEM education community, to realize the Strategic Plan's vision and goals.

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.

Interagency Efforts in Support of the 2018 Strategic Plan

CoSTEM is the highest-level interagency body in the Federal government devoted to STEM education. It oversees coordination of STEM education programs across government and, every five years, creates a Strategic Plan. The Federal Coordination in STEM Education Subcommittee (FC-STEM) oversees the implementation of the Federal STEM Education Strategic Plan and advises CoSTEM and the OSTP Director on the development and progress of the collaborative work in STEM education across the Federal science agencies.

In FY2019, CoSTEM developed an implementation structure (four interconnected interagency working groups) to support work toward the goals and objectives of the Strategic Plan. The IWGs are organized by the Strategic Plan's four pathways. A fifth IWG, the Interagency Working Group on Inclusion in STEM (IWGIS), was chartered by NSTC in fulfillment of Section 308 of the *American Innovation and Competitiveness Act.*[4] A sixth IWG was formed in 2020 in response to Section 3 of the *Supporting Veterans in STEM Careers Act.*[5] FC-STEM facilitates the work of all six IWGs.

Interagency Working Groups (IWGs)

This report captures activities carried out by the IWGs from March 2021 to March 2022. 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) supports the goal of increasing diversity, equity and inclusion in STEM. The sixth IWG on Veterans and Military Spouses in STEM, supports the representation and equity of veterans and military spouses in STEM fields and careers.

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[4] 42 U.S.C. 6626:
https://uscode.house.gov/view.xhtml?path=&req=Interagency+Working+Group+Inclusion+STEM&f=treesort&fq=true&num=7&hl=true&edition=prelim
[5] 42 USC 1862t:
https://uscode.house.gov/view.xhtml?req=Supporting+Veterans+in+STEM+Careers+Act&f=treesort&fq=true&num=5&hl=true&edition=prelim&granuleId=USC-prelim-title42-section1862t

The six interagency working groups coordinate to ensure they produce complementary efforts that further the goals, pathways, and objectives of the Strategic Plan. The sections that follow provide an overview of the foci for each IWG and provide an overview of the work that the agencies through the IWGs have prioritized and pursued collaboratively.

Interagency Working Group to Develop and Enrich Strategic Partnerships (Strategic Partnerships IWG)

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

Focus of the IWG: 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.

Actions Taken Toward Implementation:
- Accomplishments of the Strategic Partnerships Interagency Working Group (IWGSP) centered on information-sharing between member agencies related to Federal agency work-based learning (WBL) opportunities and models. Most notably, the IWGSP hosted two roundtables for sharing information related to WBL opportunities amongst Federal agencies.
  - The first roundtable, entitled "Tracking Progress Towards the Attainment of DEI Objectives of WBL Investments," was held in coordination with the Transparency & Accountability Interagency Working Group (IWGTA). The goal of this roundtable was to learn how different agencies and offices are setting and measuring DEI goals in their WBL programs. The information gathered at this roundtable will be used to inform a common metrics toolkit under development by the IWGTA.
  - The second Federal agency roundtable hosted by IWGSP was entitled "Expanding Work-Based Learning Opportunities: Models from Across Federal Agencies." The goals of this roundtable were to provide examples regarding how agencies are building WBL opportunities into existing funding mechanisms and inspire other agencies and programs to pick up these models. The main takeaways from the roundtable included: WBL opportunities should be paid; WBL opportunities can be built into contracts and grants; there are some common challenges to implementing WBL opportunities, such as the complexities working with minors; WBL opportunities are a successful way to engage more students from underrepresented groups in STEM; and partnerships can be an effective way to expand WBL opportunities.
- The IWG continued its collaboration with the NSF INCLUDES Initiative to enhance public knowledge of Federal internship opportunities and promote the formation of new partnerships. IWGSP members presented Federal WBL opportunities at both the NSF INCLUDES Initiative and at a public webinar hosted by the National Network.[6] This webinar was the third in an ongoing series hosted in partnership between NSF INCLUDES Initiative and IWGSP.

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[6] The webinar can be viewed at https://www.includesnetwork.org/groups/group-home/digestviewer/viewthread?GroupId=49&MessageKey=5467e81b-aac3-4147-b87b-c7d54b7779b9&CommunityKey=5e902dcd-362e-47be-a076-16bc71e2f038&tab=digestviewer. Viewing the webinar requires creating a free login account with the NSF INCLUDES Initiative.

- Finally, the IWG engaged FC-STEM agencies interested in improving the way STEM is measured in the workforce and how STEM skills are defined. The STEM Skills activity is intended to broaden participation in, and access to, STEM learning experiences by recognizing STEM skills in all education and career pathways, rather than a select few. The IWG presented the concept to its members and conducted individual meetings with agencies to gain their input on the direction of the project. The IWG hosted an interagency meeting to present the data model.

Interagency Working Group to Engage Students where Disciplines Converge (Convergence IWG)

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

Focus of the IWG: 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.

Actions Taken Toward Implementation:
- Based on an extensive literature review and stakeholder engagements, the IWG on Convergence (IWGC) developed a report on convergence education, including a definition and overarching guidance related to convergence education. The report,[7] released after this report's reporting period in November 2022, includes resources developed by the IWGC designed to support Federal agencies and STEM education stakeholders so they can incorporate convergence education into their work to maximize the benefits of STEM education. The IWGC defines convergence education as "*driven by compelling or complex socio-scientific problems or topics, where learners apply knowledge and skills using a blended approach across multiple disciplines (i.e., transdisciplinary) to create and innovate new solutions.*" At its core, convergence education reimagines STEM to tackle the world's most pressing challenges and opportunities of the 21st century. Agencies and stakeholders are encouraged to consider how this pedagogical concept and framework can be used to enhance and evolve agency-specific STEM education programs and opportunities.
- The IWGC hosted an informational webinar in which the convergence education definition and a framework for supporting the pursuit of convergence education in STEM was presented to Federal audiences. This webinar was designed to showcase resources developed to help agencies incorporate convergence education into their work, while also offering an opportunity to discuss how this pedagogical concept and framework can be used by Federal agencies and incorporated into their unique STEM education programs. This effort enabled foundational understandings of convergence education within the Federal community and offered the opportunity to discuss the best ways to support implementation of convergence education, specifically by identifying next steps, remaining needs, questions, and concerns. Ultimately,

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[7] Convergence Education: A Guide to Transdisciplinary STEM Learning and Teaching (https://www.whitehouse.gov/wp-content/uploads/2022/11/Convergence_Public-Report_Final.pdf)

this offered an essential opportunity to prepare the Federal community to support, promote, and implement convergence education in STEM.

Understanding the path forward to successful convergence education required engagement, input, and coordination from both key external stakeholders and Federal agencies. Insights from these groups informed the understanding of the current state of convergence education, as well as the goal and future state of STEM.

Interagency Working Group to Build Computational Literacy (Computational Literacy IWG)

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

Focus of the IWG: 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.

Actions Taken Toward Implementation:
- The Computational Literacy IWG continued to execute its objectives to encourage the use of a common definition of computational literacy and support the dissemination of promising content and practices that promote computational literacy and expand use of digital platforms for teaching and learning. Using the 2020 FC-STEM Request for Information (RFI) responses and a review of the relevant research, the IWGCL finalized its guiding definition of computational literacy:

  Computational Literacy is the ability to use information, information processing agents, digital assets, networking components, and applications and systems that, combined, allow people and organizations to interact in a digital world to solve problems, either individually or with a team; to draw meaning and reasonable conclusions from digital information in both personal and professional contexts; to safely, ethically, and securely use networks (wired and wireless) and data; and to understand how computing, data, and connectivity affects society.

  Computational literacy helps an individual -
  - (A) *ethically, securely, safely, and efficiently use information processing agents, digital tools, and digital platforms to teach, learn, and solve problems, including problems with sensitive information;*
  - (B) *problem-solve (e.g., decomposing problems into manageable pieces; heuristic reasoning; algorithmic thinking computational thinking);*
  - (C) *think recursively;*
  - (D) *navigate multiple levels of abstraction;*
  - (E) *recognize patterns;*
  - (F) *collect, analyze, manage, visualize, and communicate data;*
  - (G) *translate domain knowledge into mathematical and visual models;*
  - (H) *understand the social, technical, and cultural dynamics of computational technology, including equity, inclusion, and accessibility; and*
  - (I) *critically evaluate related technologies.*

- The IWGCL also analyzed data from the RFI that identified types of digital platforms and tools used to deliver computational literacy education and training efforts. The IWGCL continued to

make progress developing a compendium of research and best practices promoting computational literacy which included sections on best practices for online learning, computational literacy in manufacturing, integration of computational literacy in STEM education, cybersecurity, digital literacy, and diversity, equity, inclusion, and accessibility.

- The IWGCL worked with the Networking and Information Technology Research and Development (NITRD) Program to populate the NITRD STEM Portal[8] with Federal STEM education and workforce development program opportunities. The NITRD STEM Portal is a searchable database for agency-sponsored internships, training programs, apprenticeships, fellowships, and other of programs offered by Federal agencies. These programs highlight opportunities for community college students, undergraduates and graduates, postdoctoral fellows, early career researchers, K-12 Educators, and K-12 students.

Interagency Working Group to Operate with Transparency and Accountability (Transparency and Accountability IWG)

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

Focus of the IWG: 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 performance evaluations, program outcomes, and participation rates; and disseminate information to external stakeholders. The complexity of Federal investments in STEM education enables a multiplicity of approaches to the implementation the Strategic Plan, and it is an essential that agencies develop operational definitions of terms, shared metrics, and best practices. This complexity requires creative and flexible approaches that focus on key points of intersection between activities to help establish and enhance returns on these investments. Developing common or shared metrics may also require consideration of available resources with the understanding that budgets vary widely across the inventory of Federal STEM education investments.

Actions Taken Toward Implementation:
- In 2022, the Transparency and Accountability Interagency Working Group (IWGTA) focused its work on exploring common metrics for assessing success with respect to the goal of increasing diversity, equity, and inclusion (DEI) in STEM. having common metrics and shared measures across agencies and programs with similar aims can help identify what works in STEM education, for whom, and in what contexts. Developing and implementing common metrics and shared measures for tracking progress are essential to realizing the goals of cross-agency coordination and accountability in STEM education and being responsive to legislative requirements. Specifically, Section 101 of the *America COMPETES Reauthorization Act of 2010* calls on CoSTEM to document "rates of participation by women, underrepresented minorities, and persons in rural areas" in its Federally sponsored STEM education programs and activities.[9]
- The IWGTA developed materials for a "toolkit" of resources for metrics commonly used in STEM education programs. The resources and recommendations provided in the toolkit are intended to support Federal STEM education investments in documenting, tracking, and assessing meaningful changes in rates of participation by members of working subgroups, and diversity,

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[8] https://www.nitrd.gov/stem4all/

[9] 42 U.S.C. §6621:
https://uscode.house.gov/view.xhtml?req=(title:42%20section:6621%20edition:prelim)%20OR%20(granuleid:USC-prelim-title42-section6621)&f=treesort&edition=prelim&num=0&jumpTo=true

equity, and inclusion (DEI) outcomes associated with participation in investment activities. The toolkit currently has two sections:
- o *Definitions of Underrepresented and Disadvantaged* – To assist agencies with this reporting requirement, IWGTA, in conjunction with the Interagency Working Group on Inclusion in STEM (IWGIS), developed a document that compiles the various definitions of "underrepresented" used by Federal agencies and programs, in general and within the specific context of STEM.
- o *Procedures for Operationalizing and Measuring Underrepresentation* – The IWGTA developed a common set of procedures that FC-STEM agencies can use to operationalize underrepresentation with respect to participation in programs and activities supported by STEM education investments; measure (under)representation (i.e. establish the extent to which specific subgroups are underrepresented at given points in time); and assess changes over time towards the goal of increasing diversity, equity, and inclusion in STEM education.
- The IWGTA hosted a Federal agency roundtable, *Tracking Progress Towards the Attainment of Diversity, Equity, and Inclusion Objectives of Work-Based Learning (WBL) Investments*, in collaboration with the IWG on Inclusion in STEM (IWGIS) and Strategic Partnerships IWG (IWGSP).

Interagency Working Group to Increase Diversity, Equity, and Inclusion in STEM (IWG on Inclusion in STEM)

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

Focus of the IWG: Increasing diversity, equity, and inclusion in STEM was one of the 2018 Strategic Plan's three central goals. When an organization's workforce is diverse 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.

Actions Taken Toward Implementation:
Efforts toward inclusion in STEM across FC-STEM agencies are coordinated by the IWGIS. For this reporting period, IWGIS carried out work under three strategic priorities.
- Priority 1: Share best practices for diversity, equity, and inclusion in the Federal STEM workforce. In September 2021, the IWG published *Best Practices for Diversity and Inclusion in STEM Education and Research: A Guide by and for Federal Agencies*, a 57-page report summarizing work on this objective over the last 18 months. The guide included an Executive Summary and a report on the Diversity in the Federal STEM Workforce, both of which were also published as stand-alone pull outs. The IWG hosted a webinar in October 2021 about the findings in the report with 190 participants across Federal agencies.
- Priority 2: Work collaboratively with other IWGs to advance key Federal actions around DEI. The IWG held a joint meeting with the Strategic Partnerships and the Transparency and Accountability IWG. The IWG co-hosted a webinar on *Models of Work-based Learning* with Strategic Partnerships. The IWG supported the webinar that Transparency and Accountability led on *Tracking Progress Toward Attainment of DEI Objectives in Work-based Learning Investments*. Also, with the Transparency and Accountability IWG, the IWG updated and finalized the definition of "underrepresented minority."

- Priority 3: Promote Inclusive Hiring Practices. The IWG circulated a survey asking Federal agencies to identify innovative and effective policies and practices that create a more inclusive hiring pathway from recruitment through onboarding. Based on the responses, the IWG is planning a roundtable to share the best policies, practices, and tools in the spring of 2022.

Interagency Working Group to Support Veterans and Military Spouses in STEM (IWG on Veterans and Military Spouses in STEM)

Participating Agencies: DOD, ED, EPA, NSF, NASA, OSTP, OMB, OPM, SBA, and VA

Focus of the IWG: Develop and implement a plan to better enable military spouses and veterans to be fully engaged in a mobile, highly technical, and malleable STEM workforce designed to advance our Nation's global leadership and economic development by increasing the representation and equity of veterans and military spouses in STEM occupations and careers through targeted government programs that support access to STEM educational pathways and the development of skillsets portable across geographic regions.

Actions Taken Toward Implementation:
- In February 2020, the *Supporting Veterans in STEM Careers Act* was signed into law, seeking to improve representation and equity of veterans and military spouses in STEM fields. The Act directed OSTP to develop and facilitate the development and implementation of a strategic plan to support veterans, service members, and military spouses in STEM education and careers by establishing an Interagency Working Group (IWG) to coordinate efforts across the Federal government. The *Supporting Veterans in STEM Careers Act* specifies that the strategic plan should: identify barriers veterans face in reentering the workforce; identify barriers military spouses face in establishing careers in STEM fields; specify short- and long-term objectives; describe the approaches that each participating agency will take; specify common metrics that will be used by Federal agencies to measure progress toward objectives; and Identify barriers requiring Federal or State legislative or regulatory changes.
- A multi-agency working group was formed to create a new strategic plan. The strategy aims to identify overarching goals and specific actions the Federal government can take to help address barriers that Veterans, transitioning service members, and military spouses experience pursuing STEM education and careers, and to propose workforce investments that fuel expansion of science and engineering to maintain global leadership in research and development. The plan was released in December 2021 and the IWG has begun the implementation process.[10]

Interagency Working Group Engagement with the STEM Education Advisory Panel

The role of the STEM Education Advisory Panel is to provide advice and recommendations to CoSTEM, assess CoSTEM's progress in carrying out responsibilities related to the *America COMPETES Reauthorization Act of 2010*, and help identify the need or opportunity to update the Federal STEM Education Strategic Plan. In August 2021, panel members discussed and approved the submission of the STEM Education Advisory Panel's report assessing CoSTEM's progress in carrying out its responsibilities under Section 101 of the *America COMPETES Reauthorization Act of 2010*. They also met with CoSTEM and NSF leadership and received updates on the FC-STEM and Interagency Working Group

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[10] STRATEGIC PLAN TO IMPROVE REPRESENTATION OF VETERANS AND MILITARY SPOUSES IN STEM CAREERS (https://www.whitehouse.gov/wp-content/uploads/2021/12/12-21_CoSTEM-STEM-Vets-Plan.pdf)

activities. A meeting is planned for April 2022 where panel members will consider the content and use of the 2018 Federal STEM Education Strategic Plan to date and provide advice to CoSTEM and FC-STEM on the areas where a next iteration strategic plan might place more emphasis. The final meeting will be held in the fall of 2022. The panel members will consider agency-level data and discuss updated information on agency and Federal government initiatives. Members of the public can find more information about meetings and minutes on the panel website.[11]

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[11] https://nsf.gov/edu/STEMEdAdvisory.jsp

Implementation of the 2018 Strategic Plan by Federal Agencies

Agency Actions that Support the Overarching Goals of the 2018 Strategic Plan

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. Below are agency activities that support the three overarching goals of the 2018 Strategic Plan.

Build Strong Foundations for STEM Literacy

- **CNCS:** AmeriCorps supports grantees that provide strong foundations for STEM literacy. In January 2022, AmeriCorps members serving with Afterschool Alliance were placed in school districts around the country to expand the STEM opportunities in after-school programs. High quality after-school programs have shown to increase students' academic performance, improve behavior, and serve as a factor in supporting regular school attendance. These programs also provide excellent opportunities for youth to explore new topics without the typical time constraints that occur during the school day. To increase these types of opportunities for children and youth, partnerships need to be developed and resource gaps need to be identified. The STEM Afterschool Expansion AmeriCorps members will work to build partnerships with STEM-related businesses, industry partners, higher education officials, and schools to increase coordination and improve the quality of after-school programs.
- **DHS:** The Coast Guard was an exhibitor at the Navy League's Annual STEM event. Displays included teaching about ship stability and the Archimedes' principle, a learning curve challenge via Legos, using virtual reality for training, 3D printing technology, and underwater drones. While most STEM expos in FY21 did not occur due to COVID-19, other expos the Coast Guard exhibits at are the USA Science and Engineering Festival, the Smithsonian Military Invention Day, and the DHS Centers of Excellence Summit. During FY21, Federal Law Enforcement Training Center (FLETC) participated in career fairs with a focus on Scientific, Technical, Engineering, and Mathematical (STEM) focus. In 2021, the ICE's Office of Human Capital's National Recruitment and Retention Unit (NRRU) participated in a virtual DHS Cybersecurity and Intelligence Webinar hosted by DHS. NRRU also participated in a CyberCorps Scholarship for Service virtual event on January 11, 2022. Over 145 participants visited the booth.
- **DOC/NOAA:** When the Coastal Ecosystem Learning Centers (CELC) network wanted to figure out how to best support teen aquarium volunteers, they decided to ask the teens themselves. Through this conversation, the idea for the first ever teen-led CELC youth summit was born. On August 6-8, 2021, 60 high school students associated with 12 different aquariums convened online for the CELC Virtual Youth Summit, which featured 21 speakers from non-profit organizations, academia, and NOAA. These speakers brought diverse perspectives on a variety of topics that will help summit participants solidify and implement action projects to address environmental issues in their home community during the 2021-2022 school year. NOAA's Environmental Literacy Program convened community resilience education grantees virtually for the first time from May 25-27, 2021. One hundred ten participants attended the event, most of whom had received funding from NOAA to build sufficient collective environmental literacy for communities to take action from 2015-2021. Participants applied NOAA's Community Resilience Education Theory of Change to their own projects and discussed relevant themes such as building a future workforce; diversity, equity, inclusion, and justice; and the evolving impacts of COVID-19.
- **DOC/USPTO:** To expand its portfolio of teaching, learning and assessment resources in innovation, STEM and transdisciplinary education, the agency's Office of Education has launched a hub for educators, parents, and students who seek engaging activities to help foster students' natural creativity, ingenuity, and innovative minds. The hub will serve as the invention education headquarters for everything related to intellectual property and make materials broadly accessible and relevant to a wide range of audiences.

The hub will complement the USPTO.gov/education webpage,[12] a webpage of resources for students and educators. The hub and USPTO Kids webpage will provide an opportunity for educators and families to access lesson plans, materials, activities, videos and instructional resources for students of all ages with a focus on creativity, STEM, and the inventive mindset.

- **DOD:** In support of Build Strong Foundations for STEM Literacy, the DOD engaged in a variety of activities across the education continuum. Three examples include: 1.) The Army Educational Outreach Program (AEOP) and its efforts the eCYBERMISSION competition, Junior Solar Sprint, Gains in the Education of Math and Science (GEMS), Camp Invention, and Unite, provided hands-on, meaningful STEM learning experiences to K-12 students through competitions or summer enrichment activities. 2.) The DOD STARBASE engaged 5th grade students across the country in challenging, "hands-on, minds-on" STEM activities. Students from predominantly Title I schools interacted with military personnel to explore STEM careers and observe real-world applications of STEM subjects. 3.) DOD STEM funded nearly 1,500 FIRST (For Inspiration and Recognition of Science and Technology) Robotics teams with over 16,000 students across the PreK-12 grade levels. DOD STEM engaged 630 scientists and engineers from DOD research laboratories and engineering centers to provide more than 200,000 hours of mentoring time to FIRST teams.

- **DOE**: The DOE National Science Bowl® continued to inspire and challenge middle school and high school students in all areas of mathematics and science, including energy. In 2021, more than 2,720 middle school students (from 355 schools) and 5,740 high school students (from 811 schools) participated in 108 regional competitions, with 44 middle school teams (211 students) and 64 high school teams (307 students) advancing to the National Finals in May 2021. Forty-nine U.S. States, the District of Columbia, and Puerto Rico were represented at regionals. More than 2,000 volunteers also participated in the local and national competitions. The national competitions are usually held in Washington DC, however due to the COVID-19 pandemic, all the regional events and the National Finals were held virtually in 2021. The virtual events, particularly those at the regional competition level, enabled more schools from underrepresented and underserved communities to gain access and participation in the events.

- **EPA:** EPA is working to build a strong foundation for STEM literacy with programming that helps learners of all ages master STEM concepts through the lens of environmental issues. Staff updated an educational game, GENERATE: the Game of Energy Choices with the most recent data and adapted the game to virtual play and provided virtual engagement instructions for educators on our website. One example of excellence from efforts beyond our formal STEM investments is our Environmental Protection Agency's Community Engagement & STEM Education Program in Research Triangle Park (RTP). From February 2021 to February 2022, the Program maintained a full schedule of engaging virtual programming, reaching 2,805 students in N.C. and nationally. Highlights included hosting the11th annual weeklong Summer Science Institute for 14 High School students, leading 31 Sessions of GENERATE: The Game of Energy Choices and 10 Career Conversations (virtual speed mentoring), 15 educator trainings, and 96 STEM presentations, many of which were request via the EPA-RTP Speakers Bureau.

- **NASA:** The Global Learning and Observations to benefit the Environment (GLOBE) program provides students and the public with an opportunity to participate in data collection and the scientific process through activities such as measurement campaigns and citizen science projects. In FY21, GLOBE signed agreements with the Governments of Bhutan and Armenia to engage teachers and students from those countries in GLOBE; 127 countries participate in the GLOBE program.

- **SI:** The Smithsonian offers many opportunities for STEM learning in our Nation's capital, online, in the classroom, and in communities across the US and abroad. Teachers, parents, and students as well as schools, districts, and state education agencies and the general public are served by the programs. A wealth of digital tools support inquiry-based learning and active engagement to spark creativity and curiosity. The Smithsonian Science Education Center offers STEM curriculum, professional development, and leadership development for schools and districts. The Lemelson Center for the Study of Invention and Innovation, Q?rius, and the Steven F. Udvar-Hazy Center offer hands-on museum activities and

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[12] https://www.uspto.gov/learning-and-resources/kids-educators

hundreds of free, innovative resources. The Smithsonian Learning Lab allows educators and students to create personal collections and individualized educational experiences. In FY21, 14.9M people were served through the Smithsonian's educational programming.

Increase Diversity, Equity, and Inclusion in STEM

- **CNCS:** In support of Increase Diversity, Equity, and Inclusion in STEM, AmeriCorps' grantee Citizen Schools launched its Makers + Mentors Network. The initiative partners with communities and organizations to uplift STEM mentoring and maker-centered learning as essential tools to build a stronger, more diverse workforce. Unlike talent, opportunity and access are not equally distributed. The program focuses on underserved and underrepresented students, including girls, students of color, and youth from low-income communities, and partners with community colleges and historically black colleges and universities.

- **DHS:** In support of DHS S&T's mission to build a talented and diverse science and engineering pipeline for homeland security, S&T administers several workforce development programs designed and marketed to the scientific academic communities and the public to meet specific programmatic goals. The Scientific Research Team (SRT) program provides research opportunities to enhance the scientific leadership at MSIs in research areas that support the mission and goals of DHS. SRTs consist of one early career faculty advisor and no more than two students (undergraduate or graduate). The teams are expected to commit to 10 weeks at one of the active DHS Centers of Excellence. Eligible faculty may receive follow-on funding up to $100,000 to continue research during the academic year. The Scientific Leadership Award (SLA) program provides grants that aim to support the ability of MSIs to learn techniques, build research capacity, and connect with various organizations conducting business in or directly supporting homeland security mission areas. Grant recipients provide experiential learning opportunities to students with the goal of placing graduates in the homeland security enterprise (HSE), including DHS and its subcomponents. Students and faculty engage in research projects related to addressing homeland security gaps identified by S&T while also providing a pathway towards student internships that provide relevant experiences to support DHS and the HSE at large.

- **DOC/NOAA:** The José E. Serrano Educational Partnership Program with Minority Serving Institutions (EPP/MSI) science forums showcase collaborative research between NOAA scientists and EPP/MSI Cooperative Science Center (CSC) students and faculty. Phase one of this year's forum took place virtually in April 2021. At the forum, NOAA leadership, EPP/MSI alumni, CSC students, and other STEM professionals discussed career journeys, cutting-edge NOAA work, and students' professional goals. Students described feeling excited, delighted, honored, and inspired after the event. Because of COVID-19 restrictions, the second phase of the forum will take place in April 2022.

- **DOC/USPTO** and the National Inventors Hall of Fame (NIHF) dedicated additional resources in FY21 specifically to support students in underserved communities to receive STEM and invention education. In FY21, NIHF impacted 236,000 children with their PreK-12 education programs in all 50 states, Washington DC, and Puerto Rico. Of those, 165,000 students received scholarships to attend. These scholarships allowed students to gain access to quality, hands-on, STEM and invention education programming who would not have otherwise been able to attend. The USPTO co-founded the National Inventors Hall of Fame in 1973 and has provided financial support for NIHF education programs such as Camp Invention program since 1991. In FY 2022, the NIHF will induct the first two Black or African American females into the National Inventors Hall of Fame in the organization's almost 50-year history.

- **DOD:** One goal of the DOD STEM Strategic Plan is to increase the participation of underserved and underrepresented groups in STEM education and workforce development programs, activities, and outreach. A majority of DOD STEM programs prioritize engaging students traditionally underserved and underrepresented in STEM. Two examples include: 1.) The Defense Threat Reduction Agency (DTRA) Joint Science & Technology Institute (JSTI)[13] continued to provide one- to two-week residential STEM

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[13] https://orise.orau.gov/jsti/

research participation programs in Maryland and New Mexico focused on underrepresented students, military-connected students, and students from economically depressed regions, as well as educators of these groups. 2.) The Missile Defense Agency (MDA) continued to execute the Inspiring Generations with New Ideas to Transform Education (IGNITE) program which is an educational initiative that aims to transform K-12 STEM education and teachers in development of the STEM pipeline, with a focus on underserved communities.[14]

- **DOE**: In 2021, the DOE Office of Science hosted over a dozen listening sessions with students, faculty, and administrators from MSIs and minority serving scientific professional societies, as well as staff and mentors from DOE National Laboratories, to identify barriers to participation in DOE programs and opportunities for addressing those barriers. The systemic barriers individuals and institutions face as well as challenges identified with DOE's business processes are being directly address through a new initiative launched in February 2022, the Reaching a New Energy Sciences Workforce (RENEW). RENEW will support projects at MSI and non-RI institutions of higher education to develop the capacity to train undergraduates and graduate students in STEM fields support by the Office of Science and pilot new partnership models and models of support that directly address barriers to participation. DOE is providing $30 million in FY 2022 to support the RENEW initiative.

- **DOT/FAA:** The COE Program is looking at approaches that will generate more involvement from Historically Black Colleges and Universities (HBCUs), Tribal Colleges and Universities (TCUs), and minority-serving institutions (MSIs) such as Hispanic-serving institutions (HSIs) and Asian American and Native American Pacific Islander-serving institutions (AANAPISIs). This may lead to partnerships from the existing member universities.

- **DOT:** Federal Railroad Administration (FRA) published three Broad Agency Announcements (BAAs) which included STEM education research/program topics. FRA has funded three universities to support STEM three efforts in Michigan, New Mexico, and California. The program includes minority serving institutions (MSIs) and historically black colleges and universities (HBCUs) partnerships targeting underrepresented groups including indigenous populations. Program funding was provided in FY 2021. In FY 2022, FRA plans to fund its fourth STEM initiative. The goal of all four initiatives is to encourage students to pursue a career in the railroad industry.

- **EPA:** A deliberate effort has been made by staff in not only the ways they conduct engagement but also the materials and messages that they provide to advance diversity, equity, inclusion, and accessibility. In collaboration with educators and researchers at the Chesapeake Bay Foundation and the EPA Office of Environmental Justice, the EnviroAtlas Building a Greenway Case Study was expanded to include mapped data from EJSCREEN and discussion prompts for application of Environmental Justice (EJ) in local decision-making contexts. The *Considering Environmental Justice (EJ) in Building a Greenway* case study[15] was piloted by the Community Engagement & STEM Education Program (CE-STEM) in Research Triangle Park (RTP) with 5 high school classes, introducing 72 students to the use of maps to support informed and equitable decision making.

- **HHS/NIH:** NIH continues to fund programs that directly support the goals of the Federal STEM Education Strategic Plan. An example is the Science Education Partnership Award (SEPA) program, which promotes interactive partnerships between biomedical and clinical researchers and pre-kindergarten to grade 12 pre-service and in-service teachers, schools, and other interested organizations. The program provides opportunities for students from underserved communities to consider careers in basic or clinical research; provides teachers with professional development in science content and teaching skills; and improves community health literacy through SEPA-funded science centers and museum exhibits on health and medicine. The Annual SEPA PI NIH SciED Conference was held virtually in 2021.[16]

- **NASA:** NASA's Minority University Research and Education Project (MUREP) continued the implementation of its partnership with the NSF in support of the NSF INCLUDES Initiative. After the

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[14] https://uahexcite.org and https://uahdetects.org

[15] https://www.epa.gov/enviroatlas/building-greenway-case-study

[16] SEPA PI NIH SciED Conference: https://scied.info/

successful launch of the partnership and the awarding of planning grants in FY20, MUREP awarded 6 MUREP INCLUDES awards in FY21. The MUREP INCLUDES awards have funded MSI-led coalitions of organizations that can collectively broaden participation in engineering. Over $7M will be awarded to MSIs and their partners over the course of these three-year awards.

- **NSF:** Persistent racial injustices and inequalities in the United States have led to renewed concern and interest in addressing systemic racism. NSF supports bold, ground-breaking, and potentially transformative projects addressing systemic racism in STEM. *Racial Equity in STEM Education (EDU Racial Equity)*[17] proposals aim to advance racial equity in science, technology, engineering, and mathematics (STEM) education and workforce development through research (both fundamental and applied) and practice. Core to this funding opportunity are proposals led by, or developed and led in authentic partnership with, individuals and communities most impacted by the inequities caused by systemic racism. Proposals will need to consider systemic barriers to opportunities and benefits, and how these barriers impact access to, retention in, and success in STEM education, research, and workforce development.

- **SI:** To tackle the issue of underrepresentation in STEM teaching and leadership, in 2021, the Smithsonian Science Education Center hosted its fifth annual STEM Teacher Leadership Diversity Summit and NSF INCLUDES Initiative funded summit alumni workshop in collaboration with Howard University[18]. This work provided annual support to over 100 different school district or state education agency teams who develop an action plan for attracting, retaining, and promoting teachers of color into the STEM teaching workforce within the STEM education ecosystem. In the summer of 2021, the Smithsonian National Air and Space Museum's Teacher Innovator Institute (TII) continued to serve middle school STEAM teachers from across the US, convening a virtual institute. Sixty-eight teachers engaged in virtual TII and the program began recruitment for the 2022 institute, which will focus on early career educators who are educators of color, LGBTQ+ educators, and/or educators with disabilities.

- **USDA**: APHIS continues to invest in minority programs that focus on STEM: Third-Party Internship Programs: Thurgood Marshall College Fund (TMCF); Conference on Asian American Leadership (CAPAL); and the Hispanic Association of Colleges and Universities (HACU), which resulted in 16 virtual internships in 2021. APHIS is also partnering with the Minorities in Agriculture, Natural Resources and Related Sciences (MANRRS) in an Animal and Health Care Academy with introduces students to non-traditional animal disciplines. APHIS is represented in the fields of Wildlife Services, Animal Care and Veterinary Services. Our representatives will also serve as mentors to the students (10).

Prepare the STEM Workforce for the Future

- **DHS:** DHS S&T created and funded the Homeland Security Professional Opportunities for student Workforce to Experience Research (HS-POWER) program that annually provides research experiences for undergraduate and graduate students majoring in homeland security related science, to include technology, engineering and mathematics (HS-STEM) disciplines as well at other HS-related disciplines. Students who express interest that align with the mission and objectives of the Department will have the opportunity to conduct research at Federal research facilities, academic institutions, or DHS components conducting research and/or product delivery in DHS mission-relevant areas. The goal of this program is to engage a diverse, educated, and skilled pool of students in HS-STEM issues and to promote long-term relationships between student researchers, DHS S&T Directorate, Federal research facilities, and industry partners that will enhance the HS-STEM workforce. Interns are placed in facilities conducting relevant homeland security research projects, which include Federal laboratories, Federally Funded Research and Development Centers (FFRDCs) and other DHS-approved venues.

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[17] For more information on Racial Equity in STEM Education (EDU Racial Equity), visit:
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505910
[18] https://ssec.si.edu/STEM-diversity

- **DOC/USPTO:** USPTO launched the development of Master Teacher of Invention Education Program (MTIP) to establish a train-the-trainer program for teachers including those who are alumni of the USPTO's National Summer Teacher Institute on Innovation, STEM and Intellectual Property (IP). MTIP aims to build K-12 educator capacity and establish the tools and training enabling teachers to deliver transdisciplinary learning experiences for students at the nexus of STEM, innovation and intellectual property. MTIP will also support educators with IP and STEM educational resources and materials and help establish sustainable connections to professional organizations and networks in their communities both locally and nationally. Paid internship programs utilizing the Pathways authority with a focus on community college and university students (Anthony Bowen Paid Work Experience Program). Funding was secured in FY21 for a pilot paid internship program utilizing the Pathways authority so that students engaging in the pilot have the opportunity for permanent positions within the Federal government upon successful completion of the program. The USPTO had not utilized this authority before FY 21 to bring on paid internship positions. Two full-time positions were created to administer the program and budget was authorized for 15 positions per fiscal year for the next 3 years. The first class of participants are anticipated in winter/summer FY22.

- **DOD:** In preparing the workforce of the future, the DOD provides a number of opportunities for students to take advantage of. Through various work experiential program (WEPs) such as internships, fellowships, apprenticeships and scholarships, the DOD engaged about 6,700 students from high school to graduate levels in immersive experiences at our defense research laboratories or engineering centers, and at our partner academic institutions. Students were mentored by DOD scientists/engineers or university faculty researchers.

- **DOD/NSA:** During the summer of 2021, 156 GenCyber programs were hosted in 46 states (plus Washington DC and Puerto Rico). Over 3500 students and 850 teachers participated in a GenCyber program. In September 2021, GenCyber hosted its annual Fall Meeting. The conference agenda highlighted best practices in offering virtual programs, the importance of diversity considerations in mentors and program staff, best practices in recruiting diverse participants, and allowed for networking amongst the academic host institutions. The National Centers of Academic Excellence in Cybersecurity (NCAE-C) initiative, Regions Investing in the Next Generation (RING) course, completed a pilot offering and will officially launch in August 2022. The NCAE-C program creates and manages a collaborative cybersecurity educational program with community colleges, colleges, and universities that: establishes standards for cybersecurity curriculum and academic excellence; includes competency development among students and faculty; values community outreach and leadership in professional development; integrates cybersecurity practice within the institution across academic disciplines; and actively engages in solutions to challenges facing cybersecurity education. The NCAE-C program is increasing the qualified cybersecurity workforce pool with 100,000+ students currently enrolled 30,000+ graduates a year. Currently there are 360+ designated NCAE-C Institutions in 48 states along with the District of Columbia and Puerto Rico.

- **DOE:** Recognizing the growing demand by DOE and U.S. industries for skilled professionals in cybersecurity, information technology, computer and data science, data analytics, network analysis, operational technology, and malware analysis and forensics and related fields, DOE has launched the DOE Omni Technology Alliance Internship Program. The Omni program, sponsored by multiple DOE offices, supports real-world experiences in an immersive environment to provide skills and training with an understanding of the mission, operations, and culture of DOE. Mentored by leading scientists and engineers and other top professionals, interns can participate in this paid internship for up to three consecutive summers and explore a Federal career with DOE in a variety of settings across the entire DOE complex. This targeted program complements the DOE programs that support over 1,500 research and technical internships at the DOE National Laboratories each year.

- **DOL:** The Department of Labor's Advisory Committee on Apprenticeship (ACA) provides advice and recommendations to the Secretary of Labor on ways to better utilize the apprenticeship training model and emphasizes three strategic areas: 1.) The expansion, modernization, and diversification of the National Apprenticeship model; 2.) The expansion of apprenticeships into new industries and sectors

including, but not limited to, cybersecurity, clean energy, advanced manufacturing, information technology, and healthcare; and 3.) Equitable access for all workers to participate and succeed in the National Apprenticeship system.[19]

- **ED:** Secretary Miguel Cardona finalized six priorities for use in agency discretionary grant programs; equitable access to rigorous STEM, including computer science, experiences is noted in Priority 2. The Department also issued a revised set of common instructions for grant applicants. In FY21, the Department convened education and industry stakeholders to discuss Work-based Learning (WBL). Based on the input received from the WBL, new national activities are in development to increase access to WBL programs in high school and postsecondary education as well as expanding career exploration and preparation in the middle grades. In FY2021, the U.S. Department of Education released a notice inviting applications (NIA) for early-phase and mid-phase Education, Innovation & Research (EIR) Grants. The EIR program provides funding to create, develop, implement, replicate, or take to scale entrepreneurial, evidence-based, field-initiated innovations to improve student achievement and attainment for high-need students; and rigorously evaluate such innovations. The EIR program is designed to generate and validate solutions to persistent education challenges and to support the expansion of those solutions to serve substantially larger numbers of students.

- **EPA:** The Office of Chemical Safety and Pollution Prevention (OCSPP) successfully piloted a virtual internship program with Minority Serving Institutions (MSIs) in 2021. The program seeks to increase the percentage of successful job applicants for OCSPP's scientific positions from underrepresented communities, by providing insights into EPA's work and the Federal hiring process. In exchange for college credit, 54 high-achieving students from 5 MSIs attended 3 hours of instruction a week, taught by OCSPP and other EPA employees. While not meeting the threshold of a CoSTEM investment, the Pilot showcases a low cost, innovative approach to reach underrepresented communities. The pilot is having significant results, in just its first year (FY21), 100% of the interns applied for at least one federal position, nearly 44% were interviewed for positions in Federal service, and approximately 22% have been hired by EPA and other agencies.

- **NRC:** The University Nuclear Leadership Program began in FY2020, formerly known as the Integrated University Program. The program traditionally supported educational grants for students and faculty through scholarships, fellowships, and faculty development related to nuclear engineering and related disciplines. In 2020, the program was broadened to support nuclear related research projects relevant to the programmatic mission of the NRC.

- **NSF:** NSF seeks to enhance support for research, development, implementation, and assessment to improve STEM education at the Nation's two-year colleges, encouraging bold, transformative projects that address immediate challenges facing STEM education at two-year colleges and/or anticipate new structures and functions of the STEM learning and teaching enterprise. *Advancing Innovation and Impact in Undergraduate STEM Education at Two-year Institutions of Higher Education*[20] program builds on prior fundamental and/or applied research in STEM education. Projects that improve student outcomes in foundational STEM courses; broaden and/or create new STEM curricula; provide STEM students with authentic research experiences, internships, and other experiential learning opportunities; increase access to high quality STEM education through new technologies; re- or up-skilling incumbent workers for new STEM jobs; build STEM career and seamless transfer pathways; and/or develop novel mechanisms to identify talent and recruit into STEM programs are considered.

- **SI:** STEM education activities at Smithsonian Astrophysical Observatory (SAO) are wide-ranging, primarily funded through PI-led competitive awards from NASA and NSF. These include Research Experiences for Undergraduates; major NASA-funded STEM Engagement programs associated with SAO's Chandra X-Ray Observatory and TEMPO missions; and the research, development, and scale-up of K-12

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[19]Information related to DoL's ACA and future recommendations by the Committee can be found at: https://www.apprenticeship.gov/advisory-committee-apprenticeship

[20] For more information on NSF's Advancing Innovation and Impact in Undergraduate STEM Education at Two-year Institutions of Higher Education, visit: https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505899

curriculum, interactive digital media, museum exhibits, and out-of-school time programs. In addition, SAO and Harvard education researchers collaborate on national-scale quantitative research studies involving the development of STEM learning assessments; predictors of effective teacher professional development; investigations of pre-college experiences that impact learners' STEM identity and career interest; and factors influencing college success in STEM. The Smithsonian Conservation Biology Institute's Center for Species Survival program offers learning opportunities for undergraduate and graduate students to gain experience in STEM fields. Specifically, participants gain knowledge in biomedical research practices, animal husbandry, and health fields. With the support of the Emerson Collective, the Smithsonian Institution is also launching a new internship program that will match 75 undergraduates from across the country with 25 Smithsonian Affiliates.

- **VA:** Expanded eligibility under the Edith Nourse Rogers STEM Scholarship program to allow scholarships for those enrolled in dual-secondary degrees and health care professionals completing clinical training to become licensed to practice in a State or locality. This section also ensures benefits under the Edith Nourse Rogers STEM Scholarship program are not subject to the months of entitlement limitations under section 3695 of title 38, U.S.C. The Rogers STEM Scholarship allows some eligible Veterans and dependents in these high-demand fields to extend their Post-9/11 GI Bill benefits by up to 9 months or $30,000 of additional benefits. VA also expanded the Veteran Employment through Technology Education Courses (VET TEC) pilot program to transitioning Servicemembers within 180 days of their separation. In addition, it increased the annual funding for the program from $15M to $45M, due to the high demand and usage of the program. VA launched the VET TEC Employer Consortium to bridge the gap between program completion and meaningful employment. The collaboration between Training Providers, Employers, and VA within the VET TEC Employer Consortium creates a key space for students to make connections, attend events hosted by VA and employer-partners, and be primed for employment success at the completion of their program.

Agency Actions that Support the Pathway: Develop and Enrich Strategic Partnerships and its objective: Foster STEM Ecosystems that Unite Communities

STEM ecosystems engage educators and individuals within and outside a formal educational setting, and include, among others, families; school districts; State, local, and Tribal governments; the Federal Government and Federal facilities; libraries; museums and science centers; community colleges, technical schools, and universities; community groups and clubs; foundations and nonprofits; faith-based organizations; and businesses.

The Federal Government advances the development of STEM education ecosystems through programs, investments, and activities that leverage partnerships. Partnerships between public and private entities provide opportunities to invest in and support STEM education programs and initiatives. Leveraging the best that each partner contributes allows for STEM education and workforce projects to be effective in supporting the Nation's current and future workforce. Below are some of the ways agencies have supported this specific objective:

- **CNCS:** AmeriCorps experienced a successful, multi-year partnership with For Inspiration and Recognition of Science and Technology (FIRST), a youth-serving nonprofit advancing STEM education by engaging young people in mentor-based programs that build STEM skills. AmeriCorps members in the VISTA program serve in low-income communities across the country and inspire an appreciation of STEM subjects in young people through FIRST robotics competitions. Focusing on bringing FIRST programs to under-represented populations within these communities makes it possible to expose more students to STEM activities. AmeriCorps members recruit volunteers and support teams of students in the competitions. Research from a multi-year longitudinal study shows FIRST is advancing its mission to increase the number of students interested in STEM, and that interest is influencing their educational and career choices. FIRST students are two times more likely to show an increase in STEM-related attitudes

and interests than comparison group students. Positive impacts are evident for all FIRST students regardless of race, gender, income, or community type.

- **DHS:** Cybersecurity and Infrastructure Security Agency (CISA) reimagined how to leverage government funds to close gaps in the cyber security workforce by bolstering in-demand cyber skills and addressing equity gaps to address the workforce shortage. CISA funded and entered two cooperative agreements with non-profit organizations (CyberWarrior and NPower). These organizations will collaborate with CISA to develop a scalable and replicable proof of concept to successfully identify and train talented individuals (CISA's $2M will cover, roughly, 170 participants, over a 3-year period). This small investment has a tremendous impact in combating the cybersecurity workforce shortage facing our nation and plays a vital role to meet the dynamic and innovative needs of the cybersecurity workplace. Utilizing non-traditional job training and apprenticeship programs will assist the Federal government, state, local, tribal, and territorial entities, as well as private sector employers, to address current and future cyber workforce needs.

- **DOC/NIST:** The National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL) is a NIST-sponsored Manufacturing USA institute whose mission is to accelerate biopharmaceutical manufacturing innovation in the United States. Since its establishment in 2017, NIIMBL has invested $18.9M in workforce development and training programs to ensure the U.S. maintains a supply of skilled workers to meet the needs of the domestic biopharmaceutical sector. NIIMBL continues to introduce talented African American/Black, Latinx, and Native American students to exciting careers in the biopharmaceutical industry and connects biopharmaceutical companies with prospects for internships and future recruitment through the NIIMBL eXperience program. NIIMBL has also funded projects that help military personnel develop new skills for careers in the biopharmaceutical sector. Recently, 41 veterans and military spouses across five cohorts in Texas and North Carolina completed the Military Service Members in Biopharma Manufacturing program, and 50% of participants received employment offers within three months of program completion.

- **DOC/NOAA:** Deep Ocean Education Project - NOAA Ocean Exploration, Ocean Exploration Trust (OET), and Schmidt Ocean Institute (SOI) are collaborating to share highlights of each organization's education materials, videos, and other information about the deep ocean in one location. The Ocean Exploration Advisory Board's Subcommittee on Education made several recommendations that centered on developing new ocean exploration education materials that address current education research and standards and organizing materials so they are easily accessible for educators and students. The Subcommittee recommended that the three ocean exploration organizations combine forces to give the public easy access to ocean exploration-related content that would support and supplement existing standards-based science curricula for educators and students.

- **DOD:** The Manufacturing Technology Office supports nine Manufacturing Innovation Institutes, which together, is a network of public/private partnerships organized around a set of technologies key to US manufacturing competitiveness. Workforce development has been a key initiative for Manufacturing USA with specific interests in (a) defining the skills and training needed for new careers in advanced manufacturing (e.g., automation, robotics, and artificial intelligence), (b) retraining and upskilling the current workforce, and (c) attracting STEM talent. The institutes engage with educational institutions and industry on a range of education, training, and development programs.

- **DOD/NSA:** The NSA and NSF co-fund and collaborate annually in the GenCyber program to increase awareness of cybersecurity content and careers at the secondary level. While the NCAE program is managed by the NSA, Federal partners include the Cybersecurity and Infrastructure Security Agency (CISA), the Federal Bureau of Investigation (FBI), the National Institute of Standards and Technology (NIST)/National Initiative on Cybersecurity Education (NICE), the National Science Foundation (NSF), the Department of Defense Office of the Chief Information Officer (DOD-CIO), and U.S. Cyber Command (USCYBERCOM). These partnerships allow for collaboration across Agencies creating coherent approaches to the cybersecurity paradigm. Further, in January 2022, the DOD under its National Defense Education Program (NDEP) released a funding opportunity announcement to foster regional ecosystem of community colleges, partnering with 4-year institutions preferably HBCUs/MIs, non-profit

organizations, and/or industry to: (1) increase the matriculation of students majoring in STEM from 2-year to 4-year colleges especially amongst underserved and underrepresented populations to include Veterans and their spouses: and (2) promote completion of certificate training programs and/or two-year degrees in STEM fields that support the DOD Critical Technology Areas. Five regional community college consortia were awarded cooperative agreements of up to $11M each over six years.

- **DOL:** DOL participated in the White House Rural Healthcare Interagency Policy Council (IPC) which focused on expanding rural healthcare access. The IPC had four short-term goals: keep rural hospitals open and address health care deserts in rural areas; expand telehealth; equip rural community health centers and other community facilities to be hubs for healthy communities; and expand the pipeline and retention of rural health care providers. The IPC's outcomes regarding these efforts contribute to the STEM Education Strategic Plan goals of increasing diversity, equity, and inclusion in STEM and preparing the STEM workforce for the future.

- **ED:** In an effort to advance STEM education and support the mission of NASA and the National Space Council, the Department has collaborated with NASA on a range of programs that span elementary, secondary, and postsecondary education. Recent examples include both formal and informal activities in the following programs: 1.) The Nita M. Lowry 21st Century Community Learning Center Program in which NASA provides technical assistance to State Education Agencies to deliver high quality engineering design challenges, educator professional development and NASA scientific and technical mentors for middle school students in afterschool programs. 2.) The Career Technical Education (CTE) Mission: CubeSat Challenge led by the Office of Career, Technical, and Adult Education in which NASA provided teaching and learning resources to help high school students design, build and launch cube satellites. 3.) NASA and ED are also collaborating on a pilot opportunity that connects opportunities within ED's Minority Science and Engineering Improvement Program (MSEIP) under the Office of Postsecondary Education and NASA's Minority University Research and Education Project. This collaboration will include introductory-level projects such as simulations, math projects, experiments, case studies, and example problems from NASA missions for students to analyze that can give STEM college majors a sense of NASA research.

- **EPA:** EPA's Region 4 College/Underserved Community Partnership Program (CUPP) partners with colleges and universities to provide technical assistance to underserved communities. Region 4's Air and Radiation Division (ARD) and CUPP[21] worked together with the North Carolina Division of Air Quality (NC DAQ) to create a university-based air emissions education and outreach program. The project included working with Shaw University staff and faculty to promote commuting alternatives and idle reduction on campus. This project will act as a model for future projects within the state of North Carolina. The goals of the project are to decrease air emissions from commuter traffic and idling, through planning, implementing, education and outreach. Shaw University students will be analyzing Raleigh, NC air data, then offer alternatives to driving to campus each day. This project will also show other Shaw University students how working in STEM research at an HBCU can assist their community.

- **HHS/NIH:** The University of Maryland -National Cancer Institute (NCI) Partnership for Integrative Cancer Research brings together the expertise and resources in the mathematical sciences, physical sciences, biological sciences, and engineering at the University of Maryland, College Park, with basic, clinical, and translational research expertise of the National Institutes of Health. This program allows qualified UMD graduate students to conduct research under the joint supervision of an NCI principal investigator and a university faculty member and includes a series of lectures, workshops, and meetings. Cancer remains a leading cause of lethality. Basic science and translational work have focused on molecular targets for drug discovery and therapeutics. Physicists and Engineers have focused on instrumentation for diagnosis. This program is unique as it bridges these disciplines to maximize innovation, accelerate discoveries and develop new therapies. The unique aspects include development of: Improved tools for diagnosis, drug delivery and pre-clinical models; More sensitive imaging modalities, assays for novel

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[21] College/Underserved Community Partnership Program (CUPP):
https://www.epa.gov/environmentaljustice/collegeunderserved-community-partnership-program

druggable targets based on applying principles of physics to cancer biology; and Mathematical models to aid in timing of administration of therapies, prediction of disease progression.

- **NASA:** NASA and LEGO Education collaborated to improve STEM literacy by bringing students and teachers an out-of-this-world STEM learning series.[22] The LEGO Build to Launch program was an exploration of the technology, STEM concepts and careers behind the Artemis I mission to the Moon. The series offered a 10-week interactive digital learning adventure that featured NASA scientists, engineers and technicians as role models for the animated LEGO space team. Episodes were designed to put students in the shoes of NASA engineers, scientists, and astronauts. During the fall of 2021, over 4000 teachers participated in open ended lessons and activities providing students with hands-on problems similar to those faced by the Artemis I team.

- **NSF:** In July 2021, NSF announced a new AI Institute for Adult Learning and Online Education,[23] partly funded by Accenture, PLC. Led by the Georgia Research Alliance, this Institute will develop novel AI techniques for enhancing the quality of adult online education, making this mode of learning comparable to that of in-person education in STEM disciplines. Together with partners in the technical college systems and educational technology sector, the Institute will advance online learning using virtual assistants to make education more available, affordable, achievable, and ultimately, more equitable. In October 2021, NSF announced a competition for two additional AI Institutes, partly funded by the Institute of Education Sciences, U.S. Department of Education.[24] These two Institutes have the theme of *AI-Augmented Learning to Expand Education Opportunities and Improve Outcomes*, addressing achievement gaps and opportunity gaps that have been exacerbated by Covid-19. One Institute will focus on STEM learning in K-12 settings and the other will focus on support for learners with disabilities.

- **SI:** The Smithsonian Learning Lab[25] is a free, interactive platform for discovering millions of authentic digital resources, creating content with online tools, and sharing in the Smithsonian's expansive community of knowledge and learning. Launched in 2016 after years of research into teachers' needs and interests, the Lab's growing audience as of February 2022 is 2 million+ users, primarily K-12. Using Smithsonian digitized resources that now number nearly 6 million, these users have created 40,000 instructional items, such as lesson plans. Since its launch, the Smithsonian's Office of Education Technology (OET) has partnered with other Smithsonian Institution organizations, universities, and cultural organizations across the US to fund and create new audience-specific functionality and content for the Learning Lab. Many of the resources draw on the content or knowledge from other US Federal Agencies.

- **VA:** VA partnered with Warrior-Scholar Project to provide Veterans with college preparation-style academic programs in STEM, Humanities, and Business & Entrepreneurship. VA and Warrior-Scholar Project have a shared goal to connect Veterans with tools and programming, to include free access to Warrior-Scholar Project preparation courses, to enhance Veterans' STEM higher education experience. This partnership provides transitioning and continuing education opportunities to Veterans which in turn will enhance future economic opportunities. VA also partnered with Hiring Our Heroes (HOH) to provide employment assistance to Veterans participating in the VET TEC program. This partnership has accelerated the hiring opportunities for VET TEC graduates while also providing in-demand talent for industry leading employers. The VET TEC pilot program provides GI Bill-eligible Veterans the opportunity to enroll in accelerated high-technology programs of education that are not GI Bill approved, such as coding boot camps. Through world-class hiring events, digital programs, and internships, HOH has served transitioning Service members, Veterans, and military spouses as they search for and find meaningful careers.

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[22] For more information on NASA/ LEGO Build to Launch, visit https://education.lego.com/en-us/build-to-launch#steam-practices

[23] AI Institute for Adult Learning and Online Education (https://www.nsf.gov/news/news_summ.jsp?cntn_id=303176)

[24] NSF announced a competition for two additional AI Institutes (https://www.nsf.gov/pubs/2022/nsf22502/nsf22502.htm)

[25] https://learninglab.si.edu/

Agency Actions that Support the Pathway: Engage Students where Disciplines Converge and its objective: Advance Innovation and Entrepreneurship Education

Innovation and entrepreneurship are critically important to U.S. competitiveness and security. Innovation generally depends on a convergence of ideas at the intersection of different fields and sectors to produce new products or processes. It often derives from and/or leads to scientific discovery. Entrepreneurship leverages and applies innovation to introduce new processes, services, and products into the marketplace and society. In an increasingly competitive global economy, STEM education that emphasizes convergent processes and promotes problem-finding and creativity is needed to accelerate innovation and entrepreneurship.

Federal agencies advance innovation and entrepreneurship education through various means including financial support, coordination, and facilitation of programs. Below are some of the ways agencies have supported this specific objective:

- **CNCS:** AmeriCorps supports a range of entrepreneurship education and economic development programs. The University of Alaska Center for Economic Development (CED) supports a Rural Entrepreneurship VISTA to conduct and share research on best practices and metrics for providing training and resources for rural entrepreneurs in low-income rural Alaskan communities.
- **DHS:** The Coast Guard hosts CG Ideas@Work, and internal crowd-sourcing platform that provides the workforce a means to submit ideas and challenges to advance the service. All members of the Coast Guard are invited and encouraged to use the Platform. The DHS STEM extension of optional practical training (OPT)[26] allows eligible students to participate in 36 months of training in a STEM field. This supports innovation, entrepreneurship, and the economy by providing students the opportunity to apply STEM knowledge gained from a U.S. school.
- **DOC/USPTO:** USPTO's National Summer Teacher Institute (NSTI) on Innovation, STEM, and Intellectual Property (IP) is a multi-day professional development training opportunity designed to support elementary, middle, and high school teachers as they incorporate concepts of making, inventing, and intellectual property creation and protection into classroom instruction. The program is open to all K-12 teachers nationwide. Teachers from all 50 states, the District of Columbia, Puerto Rico, and Guam have participated in the program and have taken the knowledge and skills about IP and invention education back to their school districts and local communities. In 2021, the program was conducted virtually in an engaging and fully immersive space using a metaverse technology platform. Also, universities, such as University of Puerto Rico (UPR) and Howard University (HU), participated in programs aimed to increase knowledge about intellectual property (IP), innovation and entrepreneurship and STEM education. At the UPR, nearly 3,000 K12 educators, 500 University faculty and over 200 local entrepreneurs were engaged as part of an island-wide effort to support educators and prepare students to compete in the global innovation economy. These efforts have contributed to a 30% increase in the number of disclosures and patent applications at UPR and has fostered multi-sector efforts to accelerate the development of entrepreneurship and innovation across Puerto Rico. At HU, the Program is an integral part of the curriculum for all first-year engineering students and in 2021, was expanded to students studying computer science.
- **DOD:** DOD programs overall are designed to encourage innovation and entrepreneurship education. Since 2011, the U.S. Army Educational Outreach Program (AEOP) has partnered with the National Inventors Hall of Fame (NIHF) to bring NIHF's flagship summer STEM program, Camp Invention, to nearly 13,000 underserved children across the country. In 2021, NDEP provided funds to sponsor 400 military connected students to participate virtually via an at-home experience for innovative, hands-on STEM (science, technology, engineering and mathematics) exploration. Alumni examples also showcase this in profound ways. For example, Gitanjali Rao, 15, was named *Time* magazine's first-ever "Kid of the Year."

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[26] For more information, visit: https://studyinthestates.dhs.gov/stem-opt-hub

Gitanjali, along with her classmates, was a member of TEAM VISION which won a 2019 AEOP STEM-In-Action Grant as part of eCYBERMISSION. The team won for their project called, *Kindly,* an anti-cyberbullying service that uses artificial intelligence (AI) and natural language processing to minimize the impact of cyberbullying.[27]

- **DOE:** Through the Office of Energy Efficiency and Renewable Energy, DOE supports several STEM training programs aimed at challenging students' skills in technology development and innovation, as well as promoting entrepreneurship skills through the development of business plans and tech-to-market strategies. This includes the Advanced Vehicle Technological Competitions (AVTC), JUMP (Join the discussion, Unveil innovation, Make connections, Promote tech-to-market) to STEM, Solar Decathlon, and Solar District Cup (aka "DOE Collegiate Solar Districts Challenge." AVTC provides training and experience for design and innovation in vehicle technologies that allows students to enter careers in advanced transportation fields. JUMP into STEM inspires students to pursue studies or a career in the building sciences through a competition that focuses on creative ideation. Solar Decathlon is a collegiate competition challenging student teams to design and construct zero energy buildings powered by renewables. The Solar District Cup (SDC) is a team-based national competition of teams from 2- and 4-year colleges and universities that teaches students the design and implementation of innovative mixed-use solar districts that are grid-smart, reliable, resilient, and cost-effective. Collectively, these programs engage hundreds of students and faculty each year.

- **DOL:** Entrepreneurship is one of the 14 required program elements that must be offered under *Workforce Innovation and Opportunity Act (WIOA)* Youth formula funding to states[28].

- **DOT:** The Summer Transportation Internship Program for Diverse Groups (STIPDG)[29] is a unique 10-week program that provides hands-on public service experience and an overview of challenges and advancements of the U.S. transportation infrastructure. This program is a critical part of U.S. Department of Transportation (DOT) efforts to increase diverse representation in its workforce. Students from minority populations are afforded opportunities to build professional networks, develop vital skills and learn about various opportunities in the transportation sector. Students may experience STEM opportunities as part of this program; however, this is not a dedicated STEM program.

- **EPA:** While not an effort that meets the threshold for a CoSTEM investment, the Environmental Research Apprenticeship Program for College and University Students[30] provides training opportunities for undergraduate and graduate students on-site at EPA's Groundwater Characterization and Remediation Division (GCRD) research facilities located in Ada, Oklahoma. The cooperative agreement with East Central University (also in Ada, OK) supports student trainees to be paid via the University and EPA staff to serve as mentors providing opportunities for the trainees to develop environmental research projects which provide essential work-based learning and real-world technical experience to the students. Challenges have also been used by EPA increasingly to build STEM literacy of environmental topics and provide opportunities to tap into the creativity of students at various stages of their educational journey. Annually EPA hosts the Campus RainWorks Challenge, and in FY21, several challenges targeted undergraduate and graduate students were issued or developed.[31]

- **HHS/FDA:** The Department of Energy reports on the Oak Ridge Institute for Science and Engineering (ORISE) Research Participation Program that FDA uses to trains a number of students annually, and in FY

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[27] https://www.usaeop.com/blog/ecybermission-student-selected-as-first-ever-time-kid-of-the-year/

[28] See examples at: https://youth.workforcegps.org/resources/2017/03/02/10/51/Entrepreneurial-Skills-Training and https://youth.workforcegps.org/resources/2021/02/16/16/13/National-Entrepreneurship-Week-Webcast.

[29] Summer Transportation Internship Program for Diverse Groups (STIPDG) | Federal Highway Administration: https://www.fhwa.dot.gov/careers/stipdg.cfm

[30] Environmental Research Apprenticeship Program for College and University Students: https://www.epa.gov/research-grants/environmental-research-apprenticeship-program-college-and-university-students

[31] Campus RainWorks Challenge: https://www.epa.gov/innovation/epa-challenges-prizes.

2021, summer students at FDA learned about regulatory science research and had the opportunity to showcase their research projects at an annual FDA Summer Student Scientific Poster Day[32].

- **HHS/NIH:** NIBIB holds a design competition for Biomedical Engineering undergraduates, the Design by Biomedical Undergraduate Teams (DEBUT) Challenge,[33] to inspire undergraduates to work in teams and take on sophisticated solutions to unmet clinical needs.
- **NASA**: MUREP Innovation & Technology Transfer Idea Competition (MITTIC) is a virtual NASA intellectual property spinoff challenge to develop new ideas for commercialization & entrepreneurship for student teams enrolled at MSIs. The winning team pitches their concept to NASA and various tech companies in Silicon Valley while also qualifying for NASA internships and earning funds up to $15,000 for their institution. MITTIC partnered with the White House Initiative on Historically Black Colleges and Universities (WHIHBCU) to present a condensed version for their HBCU scholars (Mini MITTIC) during the 2021 National HBCU Week Conference. As a result, 10 student teams comprised of 86 HBCU scholars, representing 54 MSIs across 21 states, provided lightening pitches to a panel of industry judges, engaging them in an immersive experience focused on the NASA Technology Transfer process. The scholars were also invited to hear from a panel led by Vice President Kamala Harris and the top 3 teams pitched their spinoff concepts to the HBCU Week Conference audience.
- **NSF:** In FY21, building on the success of the decade-long NSF Innovation Corps (I-Corps) program,[34] NSF announced the establishment of five I-Corps Hubs with each being a regional alliance of at least eight universities. These hubs provide experiential entrepreneurial training to academic researchers across all fields of science and engineering. NSF's Innovative Technology Experiences for Students and Teachers (ITEST) program solicited and supported projects on entrepreneurial education at the K12 level.[35]
- **SI:** Students aged 5-14 learn about the pathway from invention to innovation and entrepreneurship at Smithsonian's Spark!Lab[36] at the National Museum of American History by undertaking hands-on activities in the invention studio and through online invention challenges aligned to national STEM learning goals. Spark!Lab teaches about the process of exploring, building and testing prototypes, and then refining, selling, and sharing inventions. 240,000 visitors visit Spark!Lab annually and 60,000 undertake online design and invention challenges.
- **VA:** VA offered entrepreneurship training[37] through the Small Business Administration. Veterans can use their GI Bill benefits or our other educational assistance programs for training to become a business owner or entrepreneur.

Efforts to Disseminate Resources, Leverage Practices, and Reduce Duplication

Agency Actions that Support the Pathway: Operate with Transparency and Accountability and its objective: Leverage and Scale Evidence-Based Practices Across STEM Communities

Federal agencies should build on the existing evidence base and leverage agency resources and funding mechanisms, as available, to scale and implement it more broadly. It is important for evidence to be shared broadly and made accessible to all stakeholders invested in improving and advancing STEM education. Below are some of the ways agencies have supported this specific objective <u>through the release of new resources</u>:

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[32]FDA Summer Student Scientific Poster Day: https://www.fda.gov/science-research/fda-stem-outreach-education-and-engagement/fda-annual-student-scientific-research-day-2021

[33] https://www.nibib.nih.gov/research-programs/DEBUT-challenge

[34] NSF Innovation Corps (I-Corps) Special Report: https://www.nsf.gov/news/special_reports/i-corps/

[35]NSF ITEST program: https://beta.nsf.gov/funding/opportunities/innovative-technology-experiences-students-and-teachers-itest

[36] https://invention.si.edu/try/sparklab

[37] VA entrepreneurship training: https://www.va.gov/education/about-gi-bill-benefits/how-to-use-benefits/entrepreneurship-training

- **CNCS:** The AmeriCorps Office of Research and Evaluation commissioned the Scaling Evidence-Based Models initiative with an independent research partner, Mathematica, to deepen the understanding of our most effective program innovations and to develop an applied framework for successful scaling of evidence-backed interventions. The evidence-based framework[38] provides insights into conditions that can help identify and support effective interventions that are ready to be scaled. The framework was used to create a checklist and web-based interactive SCALER tool[39] for community-based organizations (CBOs) and practitioners interested in increasing their impact within local communities to assess readiness of a model or intervention to scale. The framework and its scaling checklists[40] can be used to determine whether an intervention has sufficient evidentiary support of improving participant outcomes, and to establish intervention-level and organizational-wide processes and supports necessary for successful implementation. This interactive, web-based tool can be utilized by Federal agencies, CBOs, and funders. A Superintendent's/Principal's Toolkit to Utilizing National Service Resources[41] is an online resource for education professionals. The toolkit provides guidance for schools, local education agencies, state education agencies, nonprofits, state and local government agencies, universities and colleges, tribal nations, and others to request participants to address local challenges they have identified, including STEM. The resource provides specific examples of how AmeriCorps supports STEM and actionable steps for local entities to take.
- **DOC/NIST:** Launched on the public nist.gov website in Dec 2021, the NIST Educational STEM Resource registry (NEST-R) enhances the discovery of and access to NIST educational and workforce development content through a centralized, curated directory of NIST's STEM resource records. Built for students, educators, and career learners, extensive metadata on each record enhances search functionality and usability. By design, the topics filter, based on the NIST Taxonomy, connects users to standards research and metrology. The Configurable Data Curation System (CDCS), the backbone of NEST-R, is maintained by NIST to support multiple registry systems. However, NEST-R is the first deployment of CDCS for an education-focused registry and has the potential to support a federated registry eco-system for Federal agencies.[42]
- **DOC/NOAA:** The Deep Ocean Education Project is a resource hub that provides access to ocean exploration-based learning for educators, students, and anyone else interested in learning more about our deep ocean. This website is the result of a collaboration between NOAA Ocean Exploration, Ocean Exploration Trust (OET), and Schmidt Ocean Institute (SOI).[43] NOAA's education resource collections updates - Hurricane Safety Explainer[44] talks about how to stay safe from dangerous, deadly storms and covers topics like causes of death and numbers of fatalities associated with hurricanes. An updated Climate Change Resource Collection was also released.[45] Teaching about climate change can be a daunting challenge, but it is a critical field for students to learn about, as it affects many parts of society. This collection is designed to help educators better understand climate change impacts and access NOAA's resources. Linked resources are organized into collections that provide the user with a toolkit of materials and activities suitable for integration into a variety of educational settings.
- **DOC/USPTO:** USPTO built upon the success of its Journeys of Innovation feature stories and used those as a platform to share stories of diverse inventors and innovators through a series of interviews and personal accounts. USPTO through its Office of Innovation Outreach conducted a number of workshops to introduce audiences to a wide range of researchers, inventors, and entrepreneurs in an effort to

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[38] https://americorps.gov/evidence-exchange/scaling-programs-research-evidence-effectiveness
[39] Scaler tool: https://americorps.gov/grantees-sponsors/evaluation-resources/scaler)
[40] Scaling checklists: https://americorps.gov/evidence-exchange/scaling-checklists-assessing-your-level-evidence-readiness-scaler)
[41] Leveraging National Service in Your Schools: https://americorps.gov/sites/default/files/document/ Leveraging-National-Service-in-Your-Schools.pdf)
[42] https://nestr.nist.gov/
[43] Deep Ocean Education Project resource hub: https://deepoceaneducation.org/.
[44] Safety Explainer: https://www.noaa.gov/education/explainers/hurricane-safety-explained
[45] https://www.noaa.gov/education/resource-collections/climate/climate-change-impacts

highlight the many faces of the innovation ecosystem. The featured stories and the opportunities to hear from a diverse group of innovators further sparks innovation and demonstrates what is possible in all communities.   Specific examples include the Women's Entrepreneurship Symposium, Together in Innovation, Hispanic Heritage Month Program, InventionCon, Veterans, and the Black Innovators Program during Black History Month which included contemporary Black Women inventors.

- **DOD:** The DOD STEM website continues to provide programmatic information, evaluative information, success stories and examples of best practices about all DOD STEM efforts. DOD launched digital resources on its website[46] to include: 1.) the DOD Innovators Awardees section featuring DOD scientists and engineers (S&Es) in the DOD Innovator Spotlight Series, a monthly open-to-the-public webinar where awarded S&Es share their cutting-edge work and best practices; 2.) the STEM careers section encourages visitors to explore the different types of careers available across the DOD, while providing examples of student alumni and current DOD S&Es in those related fields and opportunities for students (activities, competitions, internships and scholarships) in pursuit of these career pathways; 3.) blog posts developed by DOD STEM Teacher Ambassadors, a cohort of selected teachers who work together to curate remote-learning and digital materials that are made available to all educators nationwide; 4.) the DOD STEM brochure that provides an overview about opportunities; 5.) impact information; and 6.) the DOD STEM communications toolkit, a one-pager guide to navigate the website.

- **DOD/NSA:** The Regions Investing in the Next Generation (RING) initiative launched a website.[47] The National Center of Academic Excellence in Cybersecurity (NCAE-C) website[48] was launched in June of 2021. The NCAE-C website contains NCAE-C requirements, resources, news, and related cybersecurity links to include a link to NCAE-C designated institutions.

- **DOL:** The Career Trajectories and Occupational Transitions Study and Dashboard aimed to understand workers' career trajectories and transitions as they occur in the labor market, for many sectors and occupations. Occupational clusters include engineering, science, and architecture; healthcare; and information technology. Researchers used data from four large nationally representative longitudinal surveys, as well as licensed data on occupational transitions from online career profiles, to examine workers' career paths and wages. Of note, the study identifies shared characteristics of *Launchpad Occupations* or occupations from which workers go on to experience higher-than-average wage growth across sectors. The interactive Career Trajectories and Occupational Transitions Dashboard was launched in January 2022.[49]

- **ED:** The department published a centralized resource for responding to the pandemic, including STEM education.[50]

- **EPA:** Our RTP-based CE-STEM Program launched an updated version of GENERATE game of energy choices (which aims to engage students in grappling with the complexities of our energy challenges to cultivate a deep and layered understanding of these challenges) and developed an online virtual version that is available for EPA led engagement or for educators to develop based on instructions on our website.[51] The CE-STEM RTP Speaker's Bureau was also updated to include online resources available for public use.[52]

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[46] https://DODstem.us

[47] RING initiative website: https://www.caecommunity.org/initiative/k12-ring

[48] NCAE-C website: https://public.cyber.mil/ncae-c/.

[49] Career Trajectories and Occupational Transitions Dashboard: https://www.dol.gov/agencies/oasp/evaluation/resources/career-trajectories-and-occupational-transitions-dashboard?_ga=2.233643676.325243617.1644948996-542099101.1644948996

[50] https://www.ed.gov/coronavirus/program-information#elsec

[51] Updated online virtual version of GENERATE game: https://www.epa.gov/climate-research/generate-game-energy-choices.

[52] CE-STEM RTP Speaker's Bureau online resources: https://www.epa.gov/rtp-speakers-bureau/epa-rtp-speakers-presentations

- **NASA:** In FY21, NASA Science Mission Directorate's Science Activation[53] program entered its second phase, building on five years of coordinated effort to develop a collective approach to actively engaging learners of all ages in the advancement of science knowledge. Thirty-three competitively selected teams from across the country leveraged over 250 partners to facilitate more than 21 million learner interactions in all 50 states and 4 US territories.

- **NSF:** NSF launched *NSF by the Numbers* a public platform that provides statistical and funding information for awards, NSF funded institutions, funding rate, proposals evaluated, and obligations by fiscal year.[54] All dashboard views are interactive, with the exception of trend lines. NSF also launched the Restricted Data Analysis System, an online tool designed to expand public access to data about the nation's doctorate recipients collected as part of the Survey of Earned Doctorates (SED). The SED collects information on the doctoral recipient's educational history, demographic characteristics, and post-graduation plans and results can be used to assess characteristics of the doctoral population and trends in doctoral education. The RDAS provides a secure platform to analyze a comprehensive set of SED variables from recent SED collections. The SED RDAS data is based on a sample subjected to statistical procedures to produce estimates that reflect the entire population of doctorate recipients and protect the confidentiality of individual-level data.

- **SI:** The Smithsonian Science Education Center's Zero Barriers in STEM Education Program[55] provides universal design for learning support for K-12 STEM educators from across 20 school districts nationally to ensure all students with disabilities see STEM as accessible to them. Smithsonian Science for Global Goals "Sustainable Communities" and "Environmental Justice" (in collaboration with scientists of the Environmental Protection Agency) community research guides[56] provide youth around the world, ages 8-17 with the scientific knowledge and skills to understand the world's most pressing issues and to become agents for change in their own communities. The Cooper Hewitt Design Museum's "Teaching with Design: Taking Action on Climate Change" supports how design can address climate change.[57] The Smithsonian Institution Traveling Exhibitions' Museum on Mainstreet exhibition Water/Ways[58] examines water's impact on humans: biological, environmental, etc. Using the Smithsonian's vast scholarship, research, and educational prowess, Smithsonian Institution Traveling Exhibition Services' *Innovation Across the Nation* builds on the themes and activities of the summer's Inspiration Nation, encouraging K-8 learners to put their own creativity into action with Smithsonian examples of ingenuity from our collections and programming.

- **VA:** VA launched a major modernization initiative called Digital GI Bill that will transform the GI Bill experience. The Digital GI Bill will modernize the information technology platform supporting the GI Bill, so we can deliver direct, online, one-stop access to GI Bill benefits and information to all GI Bill students. It will revolutionize how Veterans and beneficiaries can interface with us and their benefits, allowing them to receive benefits uninterrupted and on time and to engage with VA through electronic tools for on-the-spot service. The development of the platform features interfaces for improved user experience, increased claims processing capabilities, and enrollment verification requirements and communications to students. This modernized functionality alongside future system updates will contribute to the managed service and automation approach that will allow Veterans and their beneficiaries to access their benefits more easily while also supporting stakeholder activities with faster coordination and streamlined processes.

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[53] https://science.nasa.gov/learners
[54] The resource can be found at: https://beta.nsf.gov/about/about-nsf-by-the-numbers
[55] https://ssec.si.edu/zero-barriers
[56] https://ssec.si.edu/global-goals
[57] https://www.youtube.com/watch?v=K3Iyl0xKtI8.
[58] https://museumonmainstreet.org/content/waterways

Federal agencies continue to adjust STEM programming and public engagement to be responsive to community needs. Below are some of the ways agencies have supported this objective by **making resources accessible to external stakeholders** (particularly in light of the pandemic):

- **CNCS:** In FY 2021, AmeriCorps created a Learning Officer position in the Office of Research and Evaluation to develop a learning and dissemination approach associated with enterprise knowledge management for evidence investments. This position will work to create a culture of continued learning through making evidence assets and resources easily accessible; establishing a comprehensive plan to promote learning practices through collaboration with key stakeholders; promoting learning and disseminating what has been learned through a variety of domains; cross program learning, communication engagement, and evaluation competency building for staff, grantees, and sponsors; and increase intra/inter-agency dialogue by consolidating learning resources and tools into one singular platform that is easily accessible. While this new role is not specific to COVID-19 or STEM programming, it will contribute to strategic and coordinated agency efforts for access and use of evidence by stakeholders.

- **DHS:** As a result of public safety concerns related to the on-going global pandemic, both of CDET's in-person Industrial Control Systems trainings (2) and Continuous Diagnostic Mitigation trainings (5) successfully pivoted to a virtual platform. We trained over 2000 personnel between the two training programs and maintained a constructive learning environment with minimal transitional down-time. In FY21, FLETC engaged in a Student Volunteer program in a fully virtual environment. This ability to continue offering student internships in this manner during COVID-19 supported the educational commitment to our stakeholder community.

- **DOC/NOAA:** Remote Citizen Science Projects:[59] People have spent more time at home in the past two years, but that hasn't stopped volunteers from counting fish on underwater cameras, recording precipitation data, or reporting severe weather events. NOAA citizen science projects that could be done remotely offered thousands of people opportunities to contribute to important scientific projects. NOAA Live! 4 Kids Webinars were created in response to COVID-19-related school closures.[60] Conducted from March 2020 to April 2022, the webinars are the result of a partnership between NOAA's Regional Collaboration Network, Woods Hole Sea Grant, and the Woods Hole Oceanographic Institution. These webinars provided students access to scientists, real-life examples of possible career paths, and the opportunity to have fun interacting with others outside their home in a safe way.

- **DOC/USPTO:** USPTO programming during the pandemic pivoted to all virtual. In 2021, the National Summer Teacher Institute on Innovation, STEM and Intellectual Property Program was conducted virtually in an engaging and fully immersive space using a metaverse technology platform with very positive outcomes for all participants. The success of this Program in 2021 has paved the way for new programmatic applications in STEM and invention education including installation of the NSTI Program in 2022 among other programs designed for K-12 educators. In collaboration with the Alexandria City Public School system in Virginia and the Society of Hispanic Engineers (SHPE), the USPTO launched its first virtual *Noche de Ciencias* (Night of Science). The Program aims to increase: 1.) awareness of STEM fields and careers, 2.) participants' beliefs about their ability to succeed in STEM, and 3.) participants' sense of STEM identity. These objectives are accomplished through interactive STEM activities, networking opportunities, sharing information on SHPE, and by helping parents understand STEM opportunities through Bilingual Parent Workshops. In years prior to the pandemic, this program welcomed 500-800 attendees to an in-person evening of hands-on activities and information about STEM education and careers. In 2021, the program was held virtually and welcomed 100 attendees during a two-day program.

- **DOD:** The DOD leveraged its digital platforms to disseminate information about Department-wide opportunities, tools and resources on its website and social media accounts.[61] Several highlights include:

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[59] https://www.noaa.gov/education/stories/virtual-citizen-scientists-finish-projects-find-community-from-home

[60] https://seagrant.whoi.edu/noaa-live-webinars

[61] https://dodstem.us

1.) the creation of the DOD Innovators Spotlight Series,[62] a monthly open-to-the-public webinar featuring award winning DOD S&Es who share insight into their cutting-edge work and best practices; 2.) the launch of the Naval Horizons essay contest that introduced high school students to cutting-edge STEM topics that impact the U.S. Navy and Marine Corps.[63] This contest challenged students to picture themselves in a STEM career by designing the U.S. Navy and Marine Corps of the future; 3.) the launch of the We Heart Veterans Pin Challenge,[64] partnered between Army Educational Outreach Program and Future Engineers, that invited students in 4th - 8th grades to use their 3D design skills to create a wearable pin that demonstrates their gratitude towards veterans.

- **DOD/NSA:** The GenCyber PMO now allows host institutions to offer virtual programs. This has proven especially impactful for teacher participants as it allows them to conduct professional development while balancing other responsibilities. The other advantage to virtual offerings is that a wider geographical territory can take part in a program.

- **DOE:** DOE has launched ScienceCinema,[65] a multimedia search tool provided by the DOE Office of Scientific and Technical Information, with over 3,000 video and audio files produced by DOE National Laboratories, other DOE research facilities, and the European Organization for Nuclear Research (CERN). By using innovative, state-of-the-art audio indexing and speech recognition technology from IBM Watson to allow users to quickly find video and audio files, DOE ScienceCinema delivers the precision searching already common in text-based databases. Made available for research, training and educational purposes, users can search for specific words and phrases, and precise snippets of the video where the search term was spoken will appear.

- **DOL:** The Employment and Training Administration (ETA) developed a series of technical assistance resources related to Coronavirus (COVID-19), to help state and local workforce leaders and other stakeholders to assist the public workforce system during this crisis.[66] In December 2021, the USDOL Office of Apprenticeship (OA) awarded more than $8 million in contract investments to four national Industry Intermediaries to expand the use of Registered Apprenticeship in sectors affected by COVID-19. Stem-related target sectors included: 1.) Electric power generation, transmission and distribution; 2.) Key supply chains including semi-conductors, advanced batteries, critical minerals and strategic materials, pharmaceuticals and active ingredients and transportation equipment manufacturing; and 3.) Transportation and logistics operations for supply chain distribution including air, rail, water and support activities.[67] OA provided links to COVID resources for grantees.[68] Information on converting to virtual learning was posted.[69] Additionally, the State Apprenticeship Expansion, Equity and Innovation funding opportunity announcement DOL/ETA_FOA-ETA-21-07 called out the need to help expand the Registered Apprenticeship Program model within states and across the nation to help individuals gain the skills necessary to fill vacancies created by the pandemic and help employers find skilled workers more easily.[70]

- **DOT/FAA:** The COE Program implemented a reduced match contribution for projects awarded and proposed during FY20 and FY21 to help program recipients deal with the economic downturn due to COVID. The recipients are universities and many of them experienced financial difficulties related to the pandemic. The reduced match allowed 25% of the total project costs which was a reduction from the 50% that was previously required.

[62] https://dodstem.us/meet/innovators/

[63] https://navalhorizons.us/

[64] https://www.futureengineers.org/weheartveterans

[65] https://www.osti.gov/sciencecinema/

[66] https://www.workforcegps.org/resources/2020/03/18/23/35/Coronavirus-COVID-19-Resources

[67] https://www.apprenticeship.gov/investments-tax-credits-and-tuition-support/expansion-ra-Intermediaries-fy22#awardee_list

[68] https://ase.workforcegps.org/resources/2020/04/21/15/16/Coronavirus-COVID-19-Resources

[69] https://www.apprenticeship.gov/delivering-apprenticeships-virtually

[70] https://www.dol.gov/sites/dolgov/files/ETA/grants/FOA-ETA-21-07.pdf

- **ED:** In March 2021, the Department hosted three events. 1.) The National Safe School Reopening Summit which gathered key education stakeholders from across the country to discuss best practices on reopening schools quickly and safely. The program featured remarks from President Biden, Vice President Harris, First Lady Dr. Biden, Secretary Cardona, and Director of the Centers for Disease Control and Prevention (CDC) Dr. Walensky. It also featured panels of students, educators, and school district leaders sharing their strategies for reopening and the impact the pandemic has had on their in-person instruction. The summit concluded with the Secretary announcing the Summer Learning and Enrichment Collaborative with the National Governors Association and the Council of Chief State School Officers. The summit was one in a series of steps the Department is taking to provide support and resources to K-12 schools as they work to reopen and equitably address the academic, social, and emotional needs of students most impacted by the COVID-19 pandemic. 2.) A virtual discussion on *Addressing the Impact of COVID-19 through Summer Learning and Enrichment,* co-hosted with CDC. 3.) The first in its *Lessons from the Field* webinar series, running bi-weekly through June and focusing on key topics across early childhood, K-12 education, and postsecondary education: safe and healthy environments; providing supports for students; and teacher, faculty, and staff well-being, professional development, and supports.

- **EPA:** In response to the Pandemic, many of EPA's efforts including the investment P3 and non-investment threshold activities went virtual. A key component of the P3 learning experience is the student teams showcasing their research and engaging with fellow P3 student teams at EPA's National Student Design Expo (NSDE).[71] EPA pivoted to a virtual Expo and developed a website where teams had virtual booths. This format allowed for participant engagement and networking as the public could visit each booth, view materials (digital posters and videoed presentations), and leave questions. The Expo website was available for the entire week to give interested parties adequate time to view materials. We know that the students value the in-person NSDE and all the opportunities for them to interact with environmental entrepreneurs and investors when we host the NDSE at industry leading events around sustainability. To increase innovation and allow more P3 teams to participate in the later phases of design demonstration, it has been proposed that P3 shift from a two-phase to a single phased approach.

- **NASA:** In FY21, NASA continued to offer virtual internships to students across the country. Virtual internships have reduced travel-related barriers to participation and mitigated risks posed by the COVID-19 pandemic. Many of NASA's Artemis Student Challenges have made modifications to existing challenges due to the pandemic. In doing so, NASA found that these modifications demonstrate promising approaches to breaking barriers for new teams and/or teams with limited resources. NASA's Office of STEM Engagement also hosted its first fully-virtual conference for its PIs and others in its stakeholder community in March 2021, enabling 900+ attendees to learn more about NASA's STEM engagement work and to make valuable connections. NASA Science has also invested in virtual platforms enabling STEM equity, since more in the science community and broader communities can access virtual events they could not reach in person. All online events are captioned and/or have ASL interpreters. While virtual approaches show promise in reaching a broader audience, more research is needed to determine if learning is enhanced via digital mechanisms.

- **NSF:** In support of on-going efforts, NSF renewed and expanded exiting partnerships in FY 2021. In addition to expanding partnerships, NSF issued a variety of Dear Colleague Letters (DCLs) increasing support of the STEM education community impacted the most by COVID-19. Some examples include: 1.) NSF 21-096: *Dear Colleague Letter: TCUP STEM Innovative Faculty Support*: Native populations have been disproportionately impacted by the global COVID-19 pandemic, including significant negative impacts on tribal colleges and universities (TCUs). This DCL highlighted NSF support for activities deemed essential to mitigate against the impact of the pandemic on student achievement in STEM courses or programs of study and requests for support of current full-time STEM faculty members at a TCUP-eligible institution of higher education can be made through a RAPID Response Research (RAPID) proposal.[72] 2.)

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[71] https://www.epa.gov/P3/learn-about-national-student-design-expo
[72] https://www.nsf.gov/pubs/2021/nsf21096/nsf21096.jsp

NSF 21-066: *Dear Colleague Letter: Supplemental Funding for Postdoctoral Researchers to Mitigate COVID-19 Impacts on Research Career Progression*:[73] NSF seeks to lessen the impacts of the COVID-19 pandemic on STEM research and STEM education research and development. This opportunity highlighted NSF support for sustained research productivity and career progression of early career researchers disproportionately impacted by the COVID-19 pandemic. 3.) NSF 21-086: *Dear Colleague Letter: Noyce Research Experiences in Science, Technology, Engineering, and Mathematics (STEM) Settings for Pre-Service Teachers*: This DCL highlights information in Program Solicitation NSF 21-578 that supports research experiences in STEM settings for pre-service K-12 teachers.[74]

- **SI:** Smithsonian Science Education Action Planning Institute[75] and the Office of the Under Secretary for Education's National Education Summit 2022[76] provided a series of live and asynchronous meeting opportunities. Educators learned about Smithsonian resources and also tackled the challenge of ensuring K-12 STEM education serves the needs of all teachers and learners, whether it is taking place online, in the classroom, or in a hybrid learning environment. Together participants had a chance to share lessons learned from the past year, explored how to integrate best practices in online and in-person K-12 science education, addressed issues of learning loss and learning recovery in STEM, and discussed new America Rescue Plan funding opportunities.

- **VA:** To raise awareness and encourage usage of the expanded authorities available to VA to mitigate the financial impact of the COVID-19 pandemic, VA launched a multifaceted communications campaign that featured a significant presence on social media and inclusion in VA's *coronavirus chatbot*. In addition, in support of GI Bill beneficiaries seeking careers in high-demand STEM and technology fields, VA ensured that those receiving or seeking assistance through the Rogers STEM Scholarship or VET TEC Pilot Program received award letters and other benefit information electronically to ensure no interruption in their education. To ensure our beneficiaries maintain their earned benefits during the COVID-19 pandemic, VA has worked closely with partners to develop policies that allow Veterans and their families to continue to receive their education benefits in a virtual environment.

In an effort to leverage and scale evidence-based practices across STEM communities, below are **promising- and/or evidence-based programs, practices, and/or initiatives that agencies have established to support equitable STEM education and workforce development**:

- **CNCS:** Minnesota Math Corps is an intervention program for students in grades four through eight that utilizes AmeriCorps members to deliver math intervention support to struggling students. It provides schools with materials for implementing evidence-based interventions, recruits and trains tutors and school staff, and engages in ongoing coaching. This program has been assessed with strong levels of evidence to support the efficacy of the intervention. Beneficiaries of the intervention improve math scores and AmeriCorps members receive workforce experience in careers related to math education. For more information, the evaluation study: Evaluation of a Math Tutoring Program Implemented with Community Support: A Systematic Replication & Extension.[77] Another example: Community Technology Empowerment Project (CTEP) bridges the digital divide by providing participants with the latest technology skills to help them gain sustainable employment and improve their civic, educational, and social opportunities. AmeriCorps members provide CTEP participants one-on-one mentoring and training to improve their digital skills and technology literacy. AmeriCorps members receive workforce experience in community civic engagement and education technology careers. A Return-on-Investment assessment on this program type was extremely positive. For more information, the Return-on-

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[73] https://www.nsf.gov/pubs/2021/nsf21066/nsf21066.jsp?org=NSF

[74] https://www.nsf.gov/pubs/2021/nsf21086/nsf21086.jsp

[75] https://ssec.si.edu/event/smithsonian-science-action-planning-institute

[76] https://www.si.edu/educators/national-education-summit-2022

[77] https://americorps.gov/evidence-exchange/Evaluation-of-a-Math-Tutoring-Program-Implemented-with-Community-Support:-A-Systematic-Replication-&-Extension

Investment Study: Community Technology Empowerment Project,[78] and the evaluation report: Impact of the Northstar Assessment & Related Computer Skills Programming on Employment in CTEP Programs.[79]

- **DHS**: FLETC engaged in recruitment activities with HBCUs for student recruitment, as well as cross agency hiring events and webinars with outreach to students; specifically, Equal Opportunity Publications (EOP) STEM Diversity Career Fair[80] (jointly sponsored by several large agencies and private industry partners) on June 12, 2021.

- **DOC/NOAA:** The José E. Serrano Educational Partnership Program with Minority Serving Institutions (EPP/MSI) Graduate Fellowship Program[81] is designed to serve as a future workforce pipeline to NOAA for qualified students currently supported at EPP/MSI Cooperative Science Centers and pursuing graduate degrees in NOAA mission fields. The selected EPP/MSI fellows will spend a year conducting collaborative research at a NOAA facility and will participate in professional development training. The NOAA Ocean Exploration Explorer-in-Training Program[82] piloted two new internship formats designed to give students more ways to gain the skills they need to become the next generation of ocean explorers. In response to COVID-19 safety guidelines that limited ship-based personnel on NOAA Ship Okeanos Explorer, the team moved their seafloor mapping software to a secure, cloud-based operating system. Four Explorers-in-Training were able to successfully support the Okeanos' expeditions by processing data from home. The program also introduced a 10-week summer internship that gives students the opportunity to learn about expedition operations and science communication.

- **DOC/USPTO:** A Framework for Invention Education (Lemelson Foundation) - a comprehensive community-driven framework and set of principles for Invention Education that can support its growth within formal and informal learning environments from K-12 through higher education. Invention Education has demonstrated the ability to increase student engagement and participant interest in STEM education, to promote knowledge acquisition, and to develop characteristics, skills, and mindsets that are needed not just for the future economy but for our increasingly connected world. National Inventors Hall of Fame, co-founded by USPTO, has evaluated their STEM education programs, including the Camp Invention program, for 20 years. A summary of conclusions from research and third-party evaluations is cited below.[83]

- **DOD:** (1) Recognizing that HBCUs/MSIs represent an underutilized source of top STEM talent, SMART[84] implemented the HBCU/MI Initiative which included hosting information sessions at 30 HBCUs/MIs, nine Native Serving and Tribal Colleges, and eight Hispanic Serving Institutions. The result was increased applicants from these institutions. (2) AEOP's Research and Engineering Apprenticeship Program[85] (REAP) is a paid summer internship program that focuses on developing STEM competencies among high school students from groups underserved in STEM. Students are introduced to the Army's interests in science and engineering research and mentored by a scientist or engineer as they develop STEM skills for competitive entry into science and engineering undergraduate programs. (3) The Defense Threat Reduction Agency's Joint Science and Technology Institute[86] (JSTI) focuses recruiting efforts at Title 1 schools, military connected schools, and Native American and Hispanic serving schools across the United States and successfully attracted student and teacher participants from these underserved groups.

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[78] https://americorps.gov/evidence-exchange/return-investment-study-community-technology-empowerment-project

[79] https://americorps.gov/evidence-exchange/2018-Evaluation-Report%3A-Impact-of-the-Northstar-Assessment-%26-Related-Computer-Skills-Programming-on-Employment-in-CTEP-Programs

[80] https://www.eop.com/stemexpo

[81] https://www.noaa.gov/office-education/epp-msi/csc/eppmsi-graduate-fellowship-program

[82] https://www.noaa.gov/education/stories/new-internships-give-ocean-explorers-in-training-more-ways-to-explore

[83] https://www.invent.org/educators/camp-invention/elevate

[84] https://www.smartscholarship.org/smart

[85] https://www.usaeop.com/about/our-impact/

[86] https://orise.orau.gov/jsti/

- **DOD/NSA:** GenCyber Program:[87] This Federal grant program works with academic partners to build awareness and develop sound cybersecurity programs for middle/high school students/teachers. Host institutions work within their local ecosystem to build opportunities for students and teachers at the secondary level. National Centers of Academic Excellence in Cybersecurity (NCAE-C):[88] NCAE-C program is managed by the CAE Program Office at NSA. The NCAE-C program is a designation program for Community Colleges, Colleges and Universities that are recognized by the NSA for programs that have a combination of elements related to the institution focused on outputs for determining academic achievement. This combination assures that the institution meets the desired characteristics of a CAE institution, and that the academic delivery to students is producing the qualified cybersecurity workforce needed by the nation.

- **DOE:** The 17 DOE National Laboratories engage thousands of undergraduate and graduate students in experiential learning and opportunities each year. It is essential that the DOE laboratories foster research environments that are welcoming, inclusive, and allow students from diverse backgrounds to learn and thrive, and that DOE's application processes and resources are encouraging and supporting diverse participation. In 2021, the Office of Science (SC) Office of Workforce Development for Teachers and Scientists (WDTS) completed ten listening sessions with MSIs, community colleges, and underrepresented groups to understand the barriers that prevent underrepresented and underserved groups from participating in SC workforce development programs. In collaboration with DOE Laboratories and SC research programs, WDTS is developing and implementing strategies and mechanisms to remove barriers and facilitate increased applications and participation by underrepresented and underserved groups, including experimenting with new training models and elements to support the application process and support individuals in their participation in DOE laboratory research opportunities.

- **ED:** Program evaluation is important for assessing the implementation and outcomes of local, state, and Federal programs. Designed to be used in a variety of education settings, including STEM, the Regional Education Laboratories (REL) Central's Program Evaluation Toolkit provides resources and tools to support users in contributing to evaluations of their own programs. The toolkit comprises a series of eight modules that begin at the planning stages of an evaluation and progress to the presentation of findings. Resources in the toolkit will help users create a logic model, develop evaluation questions, identify data sources, develop data collection instruments, conduct basic analyses, and disseminate findings. The What Works Clearinghouse led by the Institute of Education Science provides public resources for STEM including Webinars on Demand. Some recent topics include: Evidence-Based Practices and Programs in STEM, Evidence-Based Math, Reading, and Writing Tips for In-Person and Remote Instruction. The STEM webinars feature: the new WWC practice guide for Assisting Students Struggling with Math; Developing Fractions Instructions for K-8; Fraction Face Off! intervention report; and, Science Teachers Learning through Lesson Analysis (STeLLA) Professional Development intervention report. Additional resources such as the full libraries of practice guides and intervention reports, and other resources to support educators to use evidence-based practices are also available for free on the WWC website.[89]

- **EPA:** EPA's Office of Chemical Safety and Pollution Prevention's Virtual Internship Pilot with Minority Serving institutions is establishing a model for equitable workforce development. Created to provide a comprehensive background on various Offices and Divisions within the EPA. This program brings together over 50 USEPA staff, scientists, and personnel in efforts to educate the participating interns in understanding our work and how staff support the Agency in its mission to protect the environment and human health. Speakers and mentors are volunteer EPA members. Each meeting focuses on a specific subject or topic and will encompass the work of the hosting Office/Division. All interns are assigned to a student group composed of various students from participating institutions and an EPA mentor. This will facilitate peer community, networking, and communication. The EPA mentor guides the student groups

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[87] www.gencyber.com
[88] https://public.cyber.mil/ncae-c/
[89] https://ies.ed.gov/ncee/wwc/Resources/ResourcesForEducators

in individual discussions, holding a weekly or biweekly meeting hour, and to the best of their ability provides guidance on career avenues with the EPA.

- **HHS/NIH:** The NIH Undergraduate Scholarship Program (UGSP) offers competitive scholarships to students from disadvantaged backgrounds who are committed to careers in biomedical, behavioral, and social science health-related research. The Annual Biomedical Research Conference for Minority Students (ABRCMS) disseminates information about the UGSP and other NIH training programs. This event is considered a best/promising/emerging practice that supports STEM equity because it emphasizes the recruitment of students from populations traditionally underrepresented in STEM.

- **NASA:** In FY21, NASA used novel funding mechanisms to diversify and broaden the pool of institutions that received funding from the Office of STEM Engagement. NASA MUREP[90] awarded 11 planning grants that are designed to reduce barriers for MSIs and small businesses to compete in STMD's annual Small Business Innovation Research/Small Business Technology Transfer Research (SBIR/STTR) solicitation. Additionally, NASA awarded 21 Teams Engaging Affiliated Museums and Informal Institutions (TEAM II) Community Anchor Awards[91] to address community STEM engagement needs. These projects will reach students traditionally underrepresented in STEM across 16 states. NASA will learn more about these promising practices as these awards are implemented over the next two years. Additionally, as of 2021, approximately one-half of NASA's Science Activation[92] portfolio is focused on broadening participation for specific audiences. Specific projects focus on: Undergraduate students at Historically Black Colleges and Universities; Native American nations in OK, AK, NM, NC, and ME; Neurodiverse Learners especially on the Autism Spectrum; People who are blind or have low vision; Community college students, and Black and Latinx audiences. The program has ongoing communities of practice for women & girls, and American Indian & Alaska Natives, sharing best practices and lessons learned. New groups will start in 2022 around rural learners, Spanish language learners, and accessibility.

- **NSF:** To increase gender diversity, equity, and inclusion in the science, technology, engineering, & mathematics (STEM) academic professions has been promoting evidence-based, systemic changes in universities and colleges, NSF's ADVANCE program supports institutional self-assessments with the aim to identify STEM faculty inequities and pilot equity strategies that will inform the development of a five-year STEM faculty equity strategic plan.[93] NSF also supported the 2022 STEM for All Video Showcase,[94] an annual online event which, since 2015, has provided principal investigators, practitioners, administrators, researchers, policy makers, industry, and the public at large opportunities to learn about Federally-funded projects that improve STEM and computer science education. The theme of the 2022 Showcase was *STEM for All: Access, Inclusion, and Equity*. Visitors to the website can view and (during showcase week) participate in facilitated discussions pertaining to 100-200 three-minute project video presentations. NSF also supports the STEM for All Multiplex,[95] an online, free interactive platform that provided access to the eight-year collection of over 1,600 short videos showcasing Federally funded projects that transform science, technology, engineering, math, and computer science learning.

- **SI:** The Smithsonian Science Education Center's Leadership and Assistance for Science Education + Reform (LASER) model was highlighted in the Education Commission of the States Policy Brief, *Leadership Training: A Cornerstone of P-3 STEM Education* authored by Jennifer Zinth and Matt Weyer. The brief explores that state-level preschool through third grade (P-3) Leadership Training is critical to ensuring STEM equity in the early years by equipping instructional leaders to support learners' engagement in ongoing, high-quality, developmentally appropriate STEM experiences. They state that it also supports administrators and teachers on issues integral to STEM leadership, such as developing

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[90] https://www.nasa.gov/stem/murep/feature/nasa-invests-in-partnerships-between-minority-serving-institutions-small-businesses

[91] https://www.nasa.gov/press-release/nasa-selects-education-projects-to-help-broaden-stem-participation-

[92] https://science.nasa.gov/learners

[93] https://www.nsf.gov/pubs/2021/nsf21050/nsf21050.pdf

[94] https://stemforall2022.videohall.com

[95] https://multiplex.videohall.com

school vision, effective resource allocation and supporting professional learning. The brief highlights best practices, such as applying problem-based approaches, exposing leaders to STEM integration models in diverse settings, encouraging leaders to customize STEM approaches to local contexts, and draws on Smithsonian Science Education Center's LASER model as one example.[96],[97] Results from the study can be found here.[98]

- **USDA/APHIS:** The 1890 National Scholars Program[99] allows college students at 1890 Land Grant Institutions to get a degree in an agriculture-related discipline and upon graduation come to USDA to work fulltime. Currently, APHIS has 13 scholars who are currently enrolled. The Saul T. Wilson Scholars Program is open to students who are seeking a degree in Pre-Veterinary Science or Biomedical Sciences or (Undergraduate) or Veterinary Medicine (Graduate). This opportunity offers an annual stipend, internships and permanent employment. Currently, APHIS has 25 students enrolled. Chester A. Gipson Scholars Program is open to undergrad and graduate students in the Veterinary Medicine and related sciences fields.[100] This opportunity also offers and annual stipend, Internships and permanent employment. Currently, APHIS has 4 students enrolled.

Below are some of the ways agencies are **using tools, resources, and/or approaches to effectively disseminate deliverables**. Some of these approaches also support replicating and/or scaling promising, emerging, and best practices.

- **CNCS:** The purpose of the AmeriCorps Evidence Exchange[101] is to act as a repository of research and evaluation reports funded through AmeriCorps resources. The reports contained in this repository are intended to help deepen the agency's understanding of the most effective interventions it has funded to date; assess effectiveness and efficiency of National Service Programs; and broaden foundational research on national service, volunteering, and civic engagement. Successful tools and resources utilized by the agency include the AmeriCorps SCALER tool[102] and the evidence-based suite of research guides, peer-reviewed journal articles, checklists, case studies, rubrics,[103] and research reports. The SCALER framework can help organizations improve the lives of more people by preparing them to successfully scale effective interventions. The SCALER framework helps organizations: 1.) ensure the intervention to be scaled is likely to produce desired outcomes and is therefore worthy of being scaled, and 2.) identify whether the effective intervention and the organization are ready to scale. By identifying interventions that are Federally funded with evidence and readiness to scale, AmeriCorps can ensure invested grant dollars improve lives, and can also encourage scaling of those interventions into marginalized communities.

- **DHS:** Social media has proven to be an effective tool at highlighting Coast Guard and S&T successes to external audiences. Within the last year, we have seen news agencies pick up posts from Coast Guard senior leadership Facebook pages and highlight them on their website using the same content. Internal publications, such as reports and newsletters, have also proven to be successful tools at communicating best practices to the workforce. To reach stakeholders directly, SEVP publishes SEVIS Broadcast Messages that distribute critical and important updates to all designated school officials through the Student and Exchange Visitor Information System (SEVIS). In addition, SEVP shares important messages via email to the program's 60,000 GovDelivery subscribers and expands its outreach through its Study in the States website and social media accounts, including Twitter and Facebook.

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[96] https://www.ecs.org/wp-content/uploads/Leadership_Training_A_Conerstone_of_P-3_STEM.pdf

[97] https://www.interacademies.org/publication/case-inquiry-based-science-education-ibse-0

[98] https://ssec.si.edu/laser-i3 and https://ies.ed.gov/ncee/wwc/InterventionReport/721

[99] https://www.usda.gov/partnerships/1890NationalScholars

[100] https://www.aphis.usda.gov/aphis/banner/careers/careers/students-grads/pathways/pathways-program

[101] https://americorps.gov/about/our-impact/evidence-exchange

[102] https://www.americorps.gov/grantees-sponsors/evaluation-resources/scaler

[103] https://americorps.gov/evidence-exchange/scaling-evidence-based-models-document-review-rubrics

- **DOC/NOAA:** For FY 2021, the NOAA Education Accomplishments report transitioned from a PDF-based document to a web-based report, increasing the accessibility of the report[104]. Also, NOAA Chesapeake Bay Office has awarded 1,000 certificates to educators who have completed training in how to provide investigations into local environmental issues that lead to informed action and civic engagement through an online training course, Meaningful Watershed Educational Experience 101[105]. MWEE 101 is a free, self-paced course. It teaches how to use the Bay Watershed Education and Training Program's MWEE framework through case studies from elementary, middle, and high school.

- **DOD:** The Department relies heavily on the use of web-based resources and social media to share and promote best practices. In particular, the DOD STEM webpage[106] serves as a site where robust resources are housed, but also from which visitors can be directed to numerous other resources offered across the Components, grant partners, other Federal Agencies, and more. This site serves as a portal to all DOD opportunities, and is intentionally designed to be accessible and inclusive for all education and career levels. In FY21 the Department continued to strengthen this effort with new age resources such as the career explorer page[107] and the DOD Innovators.[108] DOD is the largest employer of Federal STEM workers, comprising 47% of the Federal workforce and including nearly 300,000 STEM-related employees across the Department. Additionally, just as the Department depend heavily in our academic and industry partners when it comes to our research and engineering mission, we also leverage these partnerships in developing future STEM talent. For this reason, the Department offers unique strengths in STEM education, mentorship, and workforce development. DOD STEM programs have numerous approaches to providing and promoting information about DOD STEM jobs, careers, skills, and opportunities. These include webinars, DOD Lab/Facility tours, newsletters, classroom visits, and more. Notably, the most-commonly implemented approach is interactions with DOD scientists and engineers (S&Es), who are a critical unique resource to the Department. Over 80% of DOD STEM programming leverages interactions with DOD S&Es, who are estimated to provide over 450,000 hours of service with DOD STEM programs.

- **DOE**: In 2021, DOE released the Public Reusable Research (PuRe) Data site,[109] which posts key data repositories, knowledge bases, analysis platforms, and other activities that strive to make data publicly available to advance scientific or technical knowledge. Spanning the range of the DOE basic research mission areas, these data resources include a data center for atmospheric data and model products, data repositories and knowledge bases for biological and environmental research, and a materials database for physical sciences. Each resource is an authoritative provider of data or capabilities in their respective subject area. Together, these high-quality public resources play a strategic role in advancing the SC mission while making data easier to find, access, and reuse across the broader scientific and education communities.

- **DOI/USGS:** The USGS piloted a program to bring USGS scientists into classrooms virtually to share information about USGS science and careers. The goal is to reach more underserved classrooms. The pilot was small, and the program is expected to launch fully in FY22.

- **DOL:** One example is the three-part roundtable on Bridging the Research-to-Practice Gap,[110] co-hosted by the Employment and Training Administration and Chief Evaluation Office. These roundtables focused on useable findings from the $1.9 billion Trade Adjustment Assistance Community College and Career Training (TAACCCT) Grant Program. Another example is the three-part roundtable on Exploring Equity Gap Interventions at Community Colleges,[111] co-hosted by the Employment and Training Administration

[104] https://www.noaa.gov/education/explainers/2021-noaa-education-accomplishments-report
[105] https://www.fisheries.noaa.gov/feature-story/1000-educators-now-certified-deliver-meaningful-watershed-educational-experiences
[106] https://DODstem.us/
[107] https://DODstem.us/explore/career
[108] https://DODstem.us/meet/innovators/
[109] https://science.osti.gov/Initiatives/PuRe-Data
[110] https://collegeconnection.workforcegps.org/resources/2022/01/10/21/59/Bridging-the-Research-to-Practice-Gap
[111] https://collegeconnection.workforcegps.org/resources/2022/01/07/20/40/Community-College-Researchers-in-Exploring-Equity-Gap-Interventions

and Chief Evaluation Office. This series focuses on how community colleges can assess and address equity gaps related to workforce outcomes.

- **DOT/FAA:** An industry website recognized the successful research of the General Aviation-COE[112]. FAA Joint Center of Excellence for Advanced Materials (JAMS) also has a successful partnership with the Office of the Secretary of Defense and Air Force Research Laboratory and Wichita State University National Institute for Aviation Research (WSU-NIAR). The technical data and methodologies are available to hundreds of organizations and published. The first volume of the CMH-17 handbook (peer-reviewed industry standard guide) contains the program data, test methods, and design guide.

- **ED:** ED uses the STEM Newsletter and ed.gov STEM landing page to effectively disseminate deliverables.[113]

- **EPA:** The Agency primarily leverages relationships built over the years with local networks of educators and participates in science teaching, environmental education, and educator conferences. With additional in-person or virtual engagement from our staff, we disseminate our STEM educational resources and lead our STEM activities. Social media, primarily @EPAresearch on Twitter and Facebook, also complements the dissemination of information. With the pandemic EPA participated in virtual educator conferences and forums. EPA continues to look to connect, partner, and leverage trusted sources and venues to draw educators and students where we can share our STEM educational resources and opportunities Through the FC-STEM Education Communications Community of Practice, EPA is collaborating with others in the Federal science agencies to amplify awareness of STEM resources, identify new venues for engagement with educators and students, plus to collaborate on opportunities and communications campaigns that increase the impact and range of our outreach efforts.

- **NASA:** In FY21, the Office of STEM Engagement published its 2020 Highlights document, featuring key accomplishments from FY20 that speak to the breadth and diversity of NASA's STEM engagement work and its impact. NASA also promotes its work through a variety of mechanisms, including through its weekly NASA EXPRESS newsletter. The NASA EXPRESS[114] electronic newsletter keeps subscribers in the know about NASA news and opportunities for educators, faculty and students. The newsletter includes updates from NASA and STEM associates about workshops, internships and fellowships; applications for grants and collaborations; online professional development; student competitions; and more. Over 56,000 people have subscribed to NASA EXPRESS, representing individuals and organizations, and the number of subscribers is constantly growing. NASA staff promote NASA EXPRESS at outreach events and on the NASA website in order to encourage diverse audiences to subscribe.

- **NIH:** In addition to carrying out its scientific mission, NIH exemplifies and promotes the highest level of public accountability. To that end, the Research Portfolio Online Reporting Tools (RePORT) website provides access to reports, data, and analyses of NIH research activities, including information on NIH expenditures and the results of NIH-supported research. One of the tools available on the RePORT website[115] is the RePORTER module,[116] which offers advanced search platforms for NIH projects. The Matchmaker tool helps users locate potential Program Officials, NIH Institutes/Centers, and review panels aligning with their research goals. In addition to RePORTER, the RePORT website also contains other tools that provide access to reports and summary statistics on NIH funding. One of these tools is the NIH Data Book, which summarizes the most commonly asked questions about the NIH budget and extramural programs. Another tool is called Awards by Location, which summarizes NIH awards for a particular fiscal year by the location and organization of the awardees.

- **NSF:** NSF supports multiple resource centers and hubs whose missions include enhancing access to the scholarship, study findings, innovations, tools, and resources produced by the Foundation's knowledge- and capacity-building investments in STEM education, equity, and workforce development. For example,

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[112] https://medium.com/faa/making-it-count-c2e78a40c782

[113] https://www.ed.gov/stem

[114] Learn more about NASA EXPRESS and subscribe today at www.nasa.gov/stem/express

[115] https://report.nih.gov/about

[116] https://reporter.nih.gov/

NSF's Center for Advancement of Informal Science Education (CAISE)[117] hosts resources for researchers and practitioners on STEM learning in informal settings such as science museums and after-school programs, including a growing collection of resources related to equity.[118] The Partnerships for Expanding Education Research in STEM (PEERS) Data Hub connects, educates, and builds a community around STEM education data resources.[119] The Community for Advancing Discovery Research in Education (CADRE) helps investigators supported by NSF's Discovery Research PreK-12 program share their methods, findings, results, and products inside the research and development community and with the greater public.[120] The Center for Integrative Research in Computing and Learning Sciences (CIRCLS) is a community-based hub for NSF-funded researchers who explore and investigate technologies that will be available to learners in 5-10 years.[121] NSF staff also engage directly in a range of outreach activities, including in-person visits, virtual visits, webinars, office hours, press releases, social media, and its own web site. Together, these approaches have a broad reach, and help to support replication and/or scale-up of promising, emerging, and best practices.

- **SI:** Smithsonian reports impact of education programming on a public dashboard.[122] Smithsonian creates playbooks or workbooks for teachers to understand best practices in diversity, equity, accessibility, and inclusion (DEAI) in STEM Education.[123,124] Smithsonian also works pan-institutionally and across Federal agencies. For example, the *Environmental Justice*[125] module published in Fall 2021 is a collaboration between science educators at the Smithsonian and scientists at EPA.

- **VA:** VBA Education Service's most effective reach has been through social media platforms like Facebook, Twitter, Instagram, email campaigns, and virtual outreach events. Education Service has conducted over 60 outreach events to include hosting five VET TEC Employer Consortium events with Chamber of Commerce's Hiring Our Heroes assisting over 400 VET TEC graduates in finding employment with companies like Black Box and VetsEZ and in developing effective resumes and interview techniques.

Agency Actions that Support the Pathway: Operate with Transparency and Accountability and its objective: Make Program Performance and Outcomes Publicly Available

At a Federal level, the sharing of performance outcomes supports coordinated policymaking and efficient use of resources. Ensuring that data documenting the outcomes of discrete activities, single-agency programs, or cross-agency initiatives and portfolios of investment are shared can inform and stimulate new thinking about synergistic activities nationally. By making the performance of programs, investments, and activities public, agencies can better identify areas of synergy and complementarity. They can also see gaps and emerging trends where, for example, greater efforts in diversity and inclusion are needed to achieve the goals of this plan. Federal agencies are committed to documenting and sharing information both for internal strategic planning purposes and to inform public audiences.

Below are some of the ways agencies are supporting this specific objective **through the release of recently completed assessments and evaluations:**

- **CNCS:** Nine new national service program models and/or interventions assessment reports were added to the AmeriCorps Evidence Exchange repository for public dissemination in FY 2021 with STEM elements. These include Jumpstart California, College Possible Milwaukee, Bridges to Career Opportunities, CIS of

[117] https://www.informalscience.org/
[118] https://www.informalscience.org/news-views/anti-racism-resource-roundup
[119] http://peersdatahub.net
[120] https://cadrek12.org
[121] https://circls.org
[122] https:// si.edu/dashboard
[123] https://ssec.si.edu/sites/default/files/other/zerobarriers/ZeroBarriersWorkbook.pdf
[124] https://ssec.si.edu/STEM-diversity
[125] https://ssec.si.edu/environmental-justice

Central Texas, YouthBuild HSE, Great Basin, PASS, PLSC Partnership, and Efficacy of AmeriCorps MT State Parks. AmeriCorps commissioned a series of Return on Investment (ROI) research studies and analyses associated with award dollars. The series conducts feasibility and ROI on 4 program models per year for FY 2020 - FY 2024. Three of the studies published to date include programs with STEM elements: YouthBuild, Washington Conservation Corps, and Community Technology Empowerment Project.

- **DOC/USPTO:** 100% of educators who participated in the 2021 NSTI USPTO's National Summer Teacher Institute (NSTI) on Innovation, STEM, and Intellectual Property program responded by either agreeing or strongly agreeing with the following evaluations: 1) Understand the four main types of intellectual property protection and how students can apply this knowledge to invention education; 2) Able to integrate intellectual property and invention education into instructional practices; 3) Able to explain the differences between a patent, trademark, trade secret and copyright. Most educators (>95%) who participated in the metaverse program in 2021 would recommend the USPTO program to a colleague and 100% of teachers rated program efficacy as being good, very good or excellent. At Howard University, first-year students enrolled in engineering and students in computer science evaluated the USPTO program on innovation and intellectual property as it relates to their STEM education. Between 94% to 98% of students at HU who responded to an anonymous survey found the program to be useful and 95% to 96% of students rated the program as either good or excellent. A noteworthy outcome points to increased student confidence in understanding intellectual property and its application to student capstone projects in design and innovation.
- **DOD:** In FY21, the DOD published several evaluation and assessment efforts at both the portfolio and programmatic level. These publications included the "DOD STEM FY19 Year in Review" - a snapshot of DODSTEM's programming in fiscal year 2019 (FY 2019). Findings present therein describe how each Component brings unique contributions to the overall DOD STEM strategy and highlight the Department's efforts to: target underserved and underrepresented populations in STEM, promote connections to the DOD workforce, and improve evaluation and assessment efforts. In FY21, several Consortiums and Programs published reports as well, including annual reports on the Army Educational Outreach Program (AEOP) consortium and programs, DOD STARBASE, and the Defense STEM Education Consortium (DSEC) Annual Program Review, among others. These reports and direct links to Component reporting webpages are available[126].
- **DOE:** The DOE Computational Sciences Graduate Fellowship (CSGF) Program is a nationally-recognized program that has supported doctoral students in their pursuit of novel scientific and engineering discoveries using high-performance computing (HPC) resources since 1991. The DOE CSGF is also a primary workforce development program for HPC – for DOE and the Nation. The DOE CSGF provides tuition and an annual stipend, and requires students pursue an approved program of study that combines a scientific or engineering discipline with computer science and applied mathematics. The program also requires students complete a 12-week practicum at one of the DOE national laboratories. In FY 2021, DOE commissioned through a Krell Institute the most recent evaluation of DOE CSGF program outcomes[127].
- **HHS/NIH:** The Summer Institute for Research Education in Biostatistics and Data Science investment by the National Heart, Lung, and Blood Institute (NHLBI) has completed an evaluation in FY2021. This R25 seeks to develop, conduct, and evaluate courses for skills development in the principles and methods of contemporary biostatistics and data science for advanced undergraduate and early graduate students that will encourage the pursuit of careers in biostatistics and data science. The program is one of the few that focus on data science and health informatics. The results of the most recent program evaluation are not publicly available. They are used internally to assess program success and determine necessary updates to program policy.
- **NASA:** In FY21, NASA continued to enhance the effectiveness of STEM engagement investments using performance assessment and evaluation-driven processes including the execution of an Annual

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[126] https://dodstem.us/about/impact/
[127] https://www.krellinst.org/csgf/study

Performance Plan (APP) and a refined Learning Agenda (evidence plan). Notable assessments conducted include a) the Minority University Research and Education Project (MUREP) Program-Level Evaluation (Phase 2) examining how MUREP activities are addressing student engagement, partnerships and competitiveness of awardees; b) an internal portfolio assessment of K-12 activities and a Next Gen STEM pilot study examining the utility of student outcome data instruments; and c) two Space Grant consortia completed year one of a 2-year pilot evaluation of multiple state programs.

- **NSF:** The Advanced Technological Education program published Advanced Technological Education Impacts 2020-2021.[128] This resource documents the program's progress in strengthening the nation's skilled technical workforce. The publication cites materials developed for projects, including for courses, modules, and lab experiments; professional development activities included webinars, workshops, and summer institutes. All the resources developed by the projects are available through ATE Central - Browse Resources[129].

- **SI:** The Smithsonian Astrophysical Observatory reported on a 2021 webinar hosted by the National Girls Collaborative Project shared results of an NSF funded study (Collaborative Research: A Study of How Pre-College Informal Activities Influence Female Participation in STEM Careers)[130]. This webinar focused on STEM identity development for females in Out-of-School Time (OST) programming. Findings included which types of precollege STEM OST programs (both structured activities including clubs, camps, and competitions, and unstructured activities like baking and stargazing), and which attributes of these programs (like interacting with mentors, taking on a leadership role and participating in hands on activities) are the most successful in increasing female students' STEM identity. In addition, the Smithsonian Science Education Center completed in FY21 an NSF INCLUDES Initiative planning grant highlighting the results of a survey of MSI's, HBCU's and other IHEs on the practices they employ to diversify the K-12 STEM teaching workforce[131].

Below are some of the ways agencies are supporting this objective **through public resources for sharing Federal program performance and outcomes:**

- **CNCS:** Publicly available resources are not specific to STEM education investments but include assets and investments in the agency's focus areas (education, economic opportunity, environmental stewardship, healthy futures, disaster response, and veterans and military families). STEM education could be an award outcome in all six focus areas. Public resources include: AmeriCorps Evidence Exchange[132]; Impact Webinars[133]; and National Service Reports[134].

- **DHS:** SEVP shares data about international students studying in STEM fields on the SEVIS Data Mapping Tool and also publishes the annual SEVIS by the Numbers report, which contains data on the number of international students participating in STEM optional practical training (OPT). SEVP is committed to educating and informing stakeholders about the rules and regulations governing the nonimmigrant student process through outreach and engagement events, including intragovernmental events, stakeholder webinars, and industry-sponsored conferences and trainings at the national and regional level. From January to December 2021, SEVP participated in 282 conferences and outreach events, a 50 percent increase from 2020, reaching more than 10,000 stakeholders.

- **DOC/NOAA:** Bay Watershed Education and Training Program impacts[135] and Environmental Literacy Program impacts[136] can be found online.

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[128] https://atecentral.net/downloads/10822/ATE-Impacts-2020-2021.pdf

[129] https://atecentral.net/resources

[130] https://onlinelibrary.wiley.com/doi/abs/10.1002/sce.21670

[131] https://ssec.si.edu/includes-sourcebook

[132] https://www.americorps.gov/about/our-impact/evidence-exchange

[133] https://www.americorps.gov/about/our-impact/webinars

[134] https://www.americorps.gov/about/our-impact

[135] https://www.noaa.gov/office-education/bwet/impacts

[136] https://www.noaa.gov/office-education/elp/impacts

- **DOC/USPTO:** National Inventors Hall of Fame has a summary of their research and third-party evaluations[137].
- **DOD:** All performance data and outcomes are publicly accessible at the DOD STEM "Our Impact" page[138]. Example program reports include: NSA's GenCyber Five Year Report,[139] STARBASE's 2021 Annual Program Report[140], AEOP's Annual Portfolio Evaluation Report of AEOP,[141] and DSEC's Defense STEM Education Consortium Annual Program Report Data Chapter.[142]
- **DOE**: In 2021, DOE established a cross-DOE working group that reports to the Under Secretary for Science and Innovation with representatives from all the DOE offices that support extramural STEM training and engagement programs and activities. The purpose of this working group is to foster greater coordination across the DOE program offices to advance DOE's STEM training and engagement priorities, develop a common, cohesive framework to communicate DOE's STEM efforts, and to bring greater visibility and accessibility to the broad range of DOE-sponsored STEM programs and activities. Through this group, DOE program offices are creating greater awareness of each others' STEM investments and identifying opportunities to collaborate on outreach and recruitment. The group is also leading the charge on establishing a new, more accessible website for finding information on all of DOE's STEM programs and training and educational resources.
- **DOI/USGS:** More information can be found online on the National Cooperative Geologic Mapping Program.[143]
- **DOL:** More information can be found online about the Employment and Training Administration's performance.[144]
- **EPA:** For the EPA STEM investment P3, the final reports of the student teams are posted on the Program's website[145] and the 2021 National Sustainable Design Expo was virtual and accessible to the public.
- **HHS/NIH:** Research products resulting from NIH funding include publications, which can be found on Pubmed[146] and subsequent NIH grant support which can be identified through RePORTER (RePORT Expenditures and Results) module. RePORTER can be found on the RePORT (Research Portfolio Online Reporting Tools) website, which provides access to a variety of reporting tools, reports, data, and analyses of NIH research activities. HHS's PubMed is a free resource supporting the search and retrieval of biomedical and life sciences literature. The PubMed database contains more than 33 million citations and abstracts of biomedical literature. RePORTER is an electronic tool that allows users to search a repository of both intramural and extramural NIH-funded research projects and access publications and patents resulting from NIH funding.
- **NASA:** NASA STEM Engagement reports annually on performance goals and success criteria outlined in an annual performance plan (APP) which is publicly available in the NASA Volume of Integrated Performance report.[147] NASA STEM Engagement information can be found under Strategic Goal 3: Address national challenges and catalyze economic growth and Strategic Objective 3.3: Inspire and engage the public in aeronautics, space, and science. Additional information about NASA's STEM Engagement accomplishments can be found in NASA's STEM Engagement Highlights Report,[148] and

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[137] https://www.invent.org/educators/camp-invention/elevate

[138] https://dodstem.us/about/impact/

[139] www.gen-cyber.com

[140] https://dodstarbase.org/resources/

[141] https://www.usaeop.com/about/our-impact/

[142] https://rise.articulate.com/share/dJQmY1Tpf6yPvxkLEQcq1ulnvKvB9jv_#/

[143] https://www.usgs.gov/programs/national-cooperative-geologic-mapping-program/science/edmap-0

[144] https://www.dol.gov/agencies/eta/performance/results/qwsr

[145] https://www.epa.gov/P3

[146] https://pubmed.ncbi.nlm.nih.gov

[147] https://www.nasa.gov/sites/default/files/atoms/files/nasa_fy22_volume_of_integrated_performance.pdf

[148] https://www.nasa.gov/sites/default/files/atoms/files/edu_nasa_stem_engagement_highlights_2021.pdf

additional information about the reach of NASA's Science Activation program can be found at, a site launched in FY21. [149]

- **NSF:** NSF continues to make advances in knowledge generation and dissemination through NSF's INCLUDES Initiative to understand what interventions work and under what conditions to broaden participation in STEM. In FY21, NSF's INCLUDES Initiative released the NSF INCLUDES Shared Measures platform[150] that presents findings and learnings around national effort to broaden participation (BP) in STEM education and careers. By documenting the achievements and progress, this platform showcases the community's achievements and raises the visibility of NSF's INCLUDES Initiative and other STEM broadening participation initiatives. Also, the Computer Science for All program (CSforAll)[151] enhances computer science education by supporting the professional development of high school computer science teachers; the development of approaches in grades K-8 that integrate computer science into existing curricula; and coordination across K-14 to increase coherence of computer science experiences for students. Led by SageFox Consulting group, one project, RPPforCS uses an approach called "Researcher Practitioner Partnerships" to develop a shared evaluation and research agenda for all awarded CSforAll projects.[152]

- **SI:** The Smithsonian Dashboard is made up of multiple STEM education programs. Each collects data separately and it is aggregated and reported through EDGE and publicly displayed in the SI Dashboard.[153] Programs range from programs for teachers, students, youth, fellows, interns, families, caregivers, schools, school districts, and state education agencies. Measures and metrics vary per program when assessing the performance goals within this single investment. For research metrics and measures, see Informal STEAM education;[154] formal K-12 STEM education;[155] undergraduate and graduate education;[156] and fellowships and research opportunities.[157] STEM programs are disaggregated by demographics and reported publicly each year.[158]

Agency Efforts to Reduce Duplication

CoSTEM's collaborative and coordinating role supports greater efficiency and cohesion across Federal STEM education programs. Interagency working groups, FC-STEM's communities of practice, and use of the Federal STEM education listserv help create learning communities within and across Federal agencies for improving implementation and evaluation of education investments. Likewise, they can support the identification of areas of potential synergy and collaboration across and within agencies. While investments limit duplication and overlap and often differ in meaningful ways, similarities—for example, in STEM fields or audiences served—can support areas of potential synergy and collaboration across and within agencies.

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[149] https://science.nasa.gov/learners/reach-map
[150] https://networksharedmeasures.org/
[151] https://beta.nsf.gov/funding/opportunities/computer-science-all-csforall-research-and-rpps
[152] https://www.sagefoxgroup.com/rppforc
[153] https://www.si.edu/dashboard
[154] https://learninglab.si.edu/about/research
[155] https://ssec.si.edu/global-goals-research
[156] https://smconservation.gmu.edu/
[157] https://fellowships.si.edu/fellowship-programs#program-1
[158] https://www.si.edu/sites/default/files/unit/oeema/diir_fy2021.pdf

Given Federal investments'[159] interest in receiving feedback from States on how the States are utilizing Federal STEM education programs and activities,[160] collaborating and coordinating events and outreach efforts are often mutually beneficial and help support Strategic Plan objectives. For example, NSF's State K-12 Education Leaders Virtual Event, held in August 2021, convened state educator leaders and representatives from state education offices across the country to discuss efforts to implement K-12 STEM education. FC-STEM and IWG representatives led a Federal Coordination in STEM Education panel. Federal partners also hosted breakouts to help disseminate Federal resources. Below are some additional ways agencies work to reduce fragmentation and duplication of their STEM education investments.

- **DHS:** While the RDT&E and Innovation Program does not have a specific STEM education investment, when conducting STEM outreach events and activities, the Coast Guard coordinates STEM activities across the service with multiple programs to ensure unity of effort, information sharing, and avoidance of any duplicative efforts.
- **DOC/NOAA:** Programs carry out specific mandates that support NOAA's mission and that are authorized and directed by statute. Individual programs have specific focus areas and are able to leverage unique Federal STEM assets, including NOAA's science, data, and expertise, to carry out mission-driven educational activities. The NOAA Education Council coordinates education activities across NOAA, bringing together representatives from NOAA's line offices, educator networks, and major education programs. The Council is chaired by the Director of NOAA Education and supported by the Office of Education. It serves as a forum to discuss education and outreach priorities and to make recommendations for NOAA leadership. The council develops and updates the NOAA Education Strategic Plan every five years and works with the Office of Education to evaluate progress annually, as required by the *America COMPETES Act* and subsequent legislation.
- **DOD:** Programs may have similar elements; however, they reach different populations (race/ethnicity, gender, geographic regions, etc.). The varied programs address the different missions of the DOD Components. In addition, some programs operate at the individual DOD laboratory level and may focus on distinct core technical science and technology competencies, supporting the need for the broad portfolio that is executed across the Department. Program evaluation and assessment efforts[161] help to document the reach of the programs. Coordination within the DOD through the STEM Advisory Council Working Group (SACWG), the Evaluation and Assessment Working Group (EACWG), and DOD STEM strategic communication efforts help to reduce fragmentation and ensure coordination of efforts. SMART is an example of a program that is funded from one source and then collaborates with over 200 labs / facilities across the Department.

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[159] Definition of CoSTEM Investment: A funded STEM education activity that has a dedicated fiscal year budget of more than $300,000 and staff to manage the budget. This budget may be part of a budget for a larger program. Federal salaries and expenses and activities that are one-time or irregular expenditure of overhead funds are excluded (See Appendix 3)

[160] Feedback from teachers (and mentors) from all 50 states was also captured by OSTP and NSF in March 2022. Press Release: https://www.whitehouse.gov/briefing-room/statements-releases/2022/02/08/president-biden-honors-117-individuals-and-organizations-with-highest-u-s-award-for-science-and-mathematics-teachers-and-mentors/; Mentor Event Readout: https://www.whitehouse.gov/ostp/news-updates/2022/02/12/ostp-and-nsf-honor-presidential-awardees-for-excellence-in-science-mathematics-and-engineering-mentoring/; Mentor Event Video: https://www.youtube.com/watch?v=xtRsPdHg3n0; Teacher Event Readout: https://www.whitehouse.gov/ostp/news-updates/2022/02/28/readout-white-house-office-science-and-technology-policy-national-science-foundation-federal-science-agencies-honor-stem-teachers-with-presidential-awards-for-excellence-in-mathematics-and-sci/ https://www.youtube.com/watch?v=XDUi0i_OnRIeacher https://www.whitehouse.gov/ostp/news-updates/2022/02/28/readout-white-house-office-science-and-technology-policy-national-science-foundation-federal-science-agencies-honor-stem-teachers-with-presidential-awards-for-excellence-in-mathematics-and-sci/; Teacher Event Video: https://www.youtube.com/watch?v=XDUi0i_OnRI

[161] https://dodstem.us/about/impact

- **DOT/FAA:** All projects related to the COE Program involve specific research objectives from the technical teams as well as the legal review team and grants management team to ensure they fall within the scope of the opportunity.
- **ED:** Senior leadership in the Department of Education is coordinating programs and investments across program offices. Led by the Office of the Deputy Secretary, a team of STEM program office and investment leaders are convened weekly to strategically align STEM investments to the Secretary's supplemental priorities to avoid duplication of effort, identify areas for collaboration, and develop new programs to advance equitable and rigorous STEM education.
- **EPA:** With many STEM Education efforts across the agency that do not meet the threshold of a CoSTEM investment, since 2020, staff across EPA have been gathering monthly in a community of practice to share best practices, raise awareness of EPA STEAM educational resources and learn best practices and educations offerings from external organizations that intersect with our mission and goals. The CoP intentionally included the Arts to push conversations around the inclusion of language arts and visual arts in conveying meaning and driving comprehension of STEM principles. The CoP created a network where there was none previously, and the CoP facilitates a method to efficiently share FC-STEM efforts and updates with EPA's STEM outreach and engagement practitioners. Within this space, community was built through a sharing of efforts, fostering collaboration, and encouraging all staff to amplify and raise awareness of their efforts via communications channels. Within the CoP are several long-term STEM outreach programs with deep roots in their local communities, including the award-winning EPA's Community Engagement & STEM Education Program (CE-STEM) in Research Triangle Park (RTP).
- **NASA:** NASA internally coordinates its STEM education/engagement investments through the NASA STEM Engagement Council (SEC). The SEC is comprised of NASA leaders from across NASA's Mission Directorates, Research Centers, and functional offices who, among other responsibilities, ensure NASA's investments in STEM education/engagement are coordinated and not duplicative of one another through an annual portfolio planning process. NASA staff are also actively involved in the FC-STEM community and leverage the extensive contacts within the community to ensure NASA's efforts are synergistic with, and non-duplicative of, STEM education activities offered by other Federal agencies.
- **NSF:** To consolidate NSF education investments in priority areas, the Agency will continue a comprehensive Foundation-wide effort to improve STEM education. NSF will use its strategic framework to guide the review, renewal, and development of solicitations for fellowship and traineeship programs, promote effective collaboration across the NSF directorates, and enhance professional development opportunities for all STEM students.
- **SI:** The Smithsonian Institution is crossing boundaries in science by working together as One Smithsonian.[162] Building on its 2018-2022 Strategic Plan called "One Smithsonian: Greater Reach, Greater Relevance, Profound Impact," the Smithsonian's goal is to promote greater collaboration and coordination across the Smithsonian to reduce fragmentation and duplication, including in its STEM education programming.[163] The Smithsonian's single STEM Education investment is made up of multiple STEM education programs across the Smithsonian. Each collects data separately and it is aggregated and reported publicly through the SI Dashboard and equity report.[164]
- **USDA:** To reduce the repetition of programs between internal USDA Mission Areas which does exist, due to the same student and program sources, USDA-APHIS is partnering with other USDA Mission Area Offices to grow internships, and expand program and employment opportunities to diverse populations. This effort will allow hosting additional AgDiscovery and Safeguarding Natural Heritage Programs at more universities, expanding opportunities to underrepresented groups to learn more about fields in agriculture, careers in USDA, and available scholarships for undergraduate/graduate students. Also, this will allow us to establish new networks of stakeholders that are unique to specific mission areas.

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[162] https://www.si.edu/dashboard/crossing-boundaries
[163] https://www.si.edu/strategicplan
[164] http://si.edu/dashboard and https://www.si.edu/sites/default/files/unit/oeema/diir_fy2021.pdf

Closing Summary

The 2018 Federal STEM Education Strategic Plan was released following a White House State-Federal STEM Education Summit held earlier in the year.[165] The central objective of the strategic plan is to ensure lifelong access to high-quality STEM education for all Americans and to position the U.S. as the global leader in STEM literacy, innovation, and employment. To achieve this objective, the strategy identifies three overarching goals: build strong foundations for STEM literacy; increase diversity, equity and inclusion in STEM; and prepare the STEM workforce for the future. Supporting these goals are four pathways: develop and enrich strategic partnerships; engage students where disciplines converge; build computational literacy; and operate with transparency and accountability. These pathways are further supported by 3-5 objectives for improving STEM education and assessing this improvement. Progress reports released in 2019,[166] 2020,[167] and 2021[168] summarize efforts made to achieve the strategic objective, including an inventory of Federal programs, their budgets, and their alignment with the goals and pathways of the Plan. FC-STEM, its interagency working groups, and the Federal agencies involved in the CoSTEM community continue the implementation of the 2018 Federal STEM Education Strategic Plan. This annual progress report captures activities supporting the strategic plan's implementation through Spring 2022, and addresses reporting requirements from the *America COMPETES Reauthorization Act of 2010* (which includes *American Innovation and Competitiveness Act of 2017* amendments).[169] Additional information about the Federal STEM education portfolio and agency investments in STEM education can be found in the following appendices.

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[165]https://trumpwhitehouse.archives.gov/wp-content/uploads/2018/06/Summary-of-the-2018-White-House-State-Federal-STEM-Education-Summit.pdf

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

[167]https://trumpwhitehouse.archives.gov/wp-content/uploads/2017/12/Progress-Report-Federal- Implementation-STEM-Education-Strategic-Plan-Dec-2020.pdf

[168] 2021-CoSTEM-Progress-Report-OSTP.pdf (https://www.whitehouse.gov/wp-content/uploads/2022/01/2021-CoSTEM-Progress-Report-OSTP.pdf)

[169]https://uscode.house.gov/view.xhtml?req=(title:42%20section:6621%20edition:prelim

Appendix 1. Agency Alignment to Plan Pathways and Objectives (Version: 12.04.2018)

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	━━													

Appendix 2. Definition of a STEM Education Investment (Version: 03.06.2019)

STEM: For the purposes of this inventory, STEM includes physical and natural sciences, technology, engineering, mathematics, and computer science disciplines, topics, or issues (including environmental science, environmental stewardship, and cybersecurity). We recognize that various different and usually broader definitions are used for "STEM." This relatively narrow definition has been chosen to constrain the focus of the inventory to specific areas that have similar educational contexts, issues, and challenges, in order to maximize the inventory's usefulness in characterizing and improving the effectiveness of the Federal spending intended to address this particular set of educational contexts, issues, and challenges.

Investment (the unit of analysis in the detailed survey): A funded STEM education activity that has a dedicated fiscal year budget of more than $300,000 and staff to manage the budget. This budget may be part of a budget for a larger program. Federal salaries and expenses and activities that are one-time or irregular expenditure of overhead funds are excluded.

STEM Education: Formal or informal (in school or out) education that is primarily focused on STEM disciplines, topics, or issues, as defined above. All the investments included in this STEM education inventory have one of the following as a primary objective:
• Learning: Develop STEM skills, practices, or knowledge of students or the public.
• Engagement: Increase learners' interest in STEM, their perception of its value to their lives, and/or their ability to participate in STEM.
• Pre- and In-Service Educator/Education Leader Performance: Train or retain STEM educators (K- 12 pre-service or in-service, postsecondary, and informal) and education leaders to improve their content knowledge and pedagogical skills.
• Postsecondary STEM Degrees: Increase the number of students who enroll in STEM majors, complete STEM credentials or degree programs, or are prepared to enter STEM careers or advanced education.
• STEM Careers: Prepare people to enter into or advance in the STEM workforce with training or certification (where STEM discipline specific knowledge and skill are the primary focus of the education investment).
• STEM System Reform: Improve STEM education through a focus on education system reform.
• Institutional Capacity: Support advancement and development of STEM personnel, programs, and infrastructure in educational institutions such as universities, informal education institutions, state education agencies, and local education agencies.
• Education Research and Development: Develop evidence-based STEM education models and practices.

For the purposes of this inventory, activities that have the following primary objectives are not considered to be a STEM education investment:
• Providing post-doctoral research fellowships/scholarships.
• Focusing on subjects other than STEM subjects or including STEM subjects as one of many possible focal subjects (more than two other non-STEM areas).*
• Focusing on broad education system reform that encompasses far more than STEM education.
• Supporting one-time or ad hoc STEM education investments.
•Engaging in volunteer activities by Federal employees (e.g., judging STEM competitions, visiting classrooms).

• Providing outreach for education (raising awareness of education programs) or communication about an agency and its activities.
• Distributing STEM education products that are no longer part of a funded education investment.
• Supporting knowledge, interest, or skills not specific to STEM disciplines.

*The Department of Education is excluded from this provision, in order to include the Department of Education's contributions to the Federal STEM education portfolio that are funded via investments that may support education in STEM and non-STEM subject areas.

Appendix 3. Designating a STEM Education Participant and adding the Status of Rural Areas (Version: 04.06.2022)

The National Science and Technology Council's Committee on STEM Education (CoSTEM) is responsible for documenting "rates of participation by women, underrepresented minorities, and persons in rural areas" in Federally sponsored STEM education programs and activities (see Section 101(b)(6) of the *America COMPETES Reauthorization Act of 2010*). A key first step in providing this information is determining who constitutes 'participants' in these programs and activities. A second step is to add participants' rural status when appropriate.

The following guidelines were developed for Federal Coordination in STEM Education (FC-STEM) Subcommittee consideration by the NSTC Transparency and Accountability Interagency Working Group (IWGTA) in FY 2019. The IWGTA executed a pilot project with ten agencies to better understand the applicability and utility of these guidelines in FY 2020. The guidelines presented here reflect insights from the pilot and additional feedback received from respondents to an FY 2021 survey.

Designating Participants

The Federal Coordination in STEM Education (FC-STEM) Subcommittee endorsed the following guidelines to assist agencies in designating participants in Federal STEM education programs and activities. *For the purposes of America COMPETES Act reporting*, these guidelines assume that:

- **Participants are only designated for activities that**
  - **are supported by a STEM education investment**, as 'STEM education investment' is defined by CoSTEM (see Appendix 2) ***and***
  - **deliver services to individuals**. An activity supported by a STEM education investment must deliver services to individuals for the activity to require participant reporting.
- **'Participants' are <u>individuals</u>**. This is true even in cases where a non-Federal organization or institution may deliver/implement the program and gain some benefit. Thus, a participant may receive services (a) as a result of an application the individual has made directly to an agency's STEM education investment supported activity ***<u>or</u>*** (b) from an organization that delivers the activity.
- **Specifically, participants are individuals who *benefit* from an activity**. This includes both individuals who benefit **<u>directly</u>** from their involvement in an activity (**<u>primary</u>** beneficiaries) and, *at the discretion of the program/managing agency*, other individuals who benefit **<u>indirectly</u>** *in a way that is aligned with the STEM education program or activity's stated goals or objectives* (**<u>secondary</u>** beneficiaries).
- **It is feasible to collect and report (aggregate) information on participant characteristics**. Key considerations in assessing the feasibility of participant reporting include:
  - **The individuals who benefit from the STEM education program or activity are "knowable".** They do not engage with the program or activity in an anonymous fashion (e.g., an individual downloading material from a website). The nature of the participation allows for demographic information to be collected. The benefit to the

individual is of a nature (e.g., adequate length or depth) to justify the administrative burden of data collection and reporting.

- o **Agency policies and authorities allow for the collection and reporting of participant information**.
- o **Any administration, financial, or other barriers to collecting and/or reporting participant information can be addressed**.

Designating Individuals as "Persons in Rural Areas"

The guidance enclosed also recommends that investments define rural areas using OMB's Core-Based Statistical Areas (CBSA). Rural areas are interpreted as the non-metropolitan counties that lie outside metropolitan statistical areas, which are defined by OMB as counties within the commuting zones of urban entities of 50,000 or more people.

In order to report an aggregate number of participants from rural areas (i.e., non-metropolitan counties) for a STEM investment, agencies are advised to internally collect and organize geographic data by zip code, or alternatively by county or by street address. Agencies will need to be able to translate these raw data into county data and the CBSA designation in their data systems.

To establish the geography of "participants in rural areas," investments are to consider the participants' respective educator sector, using the following guidance:

- For K-12 education programs, the geography of students and teachers may be defined by the location of the school.
- For higher education programs, the geography of students can be defined as either the location of students' "home-towns" or the location of the institution of higher education.
- For small scale informal education programs, like afterschool or stewardship education programs that may be place-based and working within a community, the geography of participants may best be defined by the location of the STEM intervention or activity.
- For large scale informal education development programs, like science festivals, science museums, etc., the geography of participants may rely on the intervention or activity organizer and their demographic tracking.

Assessing the Feasibility of Reporting

Not all investments/activities may be able to report and/or collect participant demographic data. Table 1 identifies key considerations for assessing the feasibility of reporting.

Table 1. Agency Challenges and Barriers to Reporting

Areas of Consideration	Specific Challenges or Barriers to Reporting
Known Participants and Participant-based Factors	The nature in which participants engage in the program/activity are such that their identity cannot be known, or demographic information cannot be collected effectively (e.g., accessing content or materials from an open online resource, members of the public attend a museum/public STEM event)
	Agency "access" to the participants and/or degree of separation between the agency and the participant (does the applicant directly apply to the agency, or an organization – how many levels removed)
	Participants are minors
	Duration of participant exposure (considerations for both long-term and short-term exposure)
Agency Policy and Authorities	Legal restrictions in the regulatory or authorizing language for an agency; Federal-wide restrictions
	Privacy Act requirements and authorities
	Program Office/Manager perception of whether demographic questions can be asked
Administrative and Costs	Paper Reduction Act waiver needed to collect information directly from participants
	Changing granting policy and grantee requirements and implementation lead time requirements
	Changing application systems and associated approvals, including obtaining appropriate approvals for systems of record that may contain Personally Identifiable Information (PII)
	Increased program costs associated with information collection and reporting

These guidelines reflect a commitment to employing common approaches when determining the feasibility of reporting on STEM education investments and their outcomes. At the same time, they recognize that

- similar Federal STEM education investments/activities may have different goals and desired outcomes and therefore may have different categories of individuals who should be counted as participants, and
- what it means to participate meaningfully (e.g., in ways that it is hypothesized—or which evidence indicates is more or less likely—to result in intended STEM engagement and/or learning outcomes) may vary considerably across investments.

Accordingly, while **these guidelines** provide a framework to facilitate common approaches to participant reporting, they **assume Federal agencies will exercise discretion in determining who to count as participants** and that subsets of reportable individuals will be determined agency by agency, taking into consideration both specific investment goals and the feasibility of generating and sharing robust evidence on the characteristics of individuals who participate in Federally-supported STEM education investments, programs, and activities.

Appendix 4. Summary of the FY2022–Enacted Federal STEM Education Investment Inventory and FY2021 Portfolio

The *America COMPETES Reauthorization Act of 2010* calls for OSTP to establish, maintain, and periodically update an inventory of Federal investments in science, technology, engineering, and mathematics (STEM) education as part of a five-year Federal STEM education strategic plan. Agencies have different definitions of "programs," "projects," and "activities." The STEM education "investment" definition was created to provide a common unit of analysis (See Appendix 2). The summary below aims to share common characteristics across and within the STEM Education investment portfolio. Data in this appendix is derived from two data calls that agencies responded to in 2022 about their investments in STEM education - a data call led by OMB and a data call led by OSTP. Agencies responded to multiple questions about the purpose of their investments, the participants served by their investments, how these investments are supporting diversity, equity and inclusion, how agencies are reporting on participation in their investments, and the evaluations that were completed or are in-progress related to these investments. The figures below provide an overview of these responses across the Federal portfolio. Each year, CoSTEM/OSTP refines its data collection and reporting process to produce the portfolio. Figure 1 shows how many investments were reported in the 2022 data call from OSTP/OMB and Figure 2 shows the estimated budget for these investments by agency.

Figure 1. Federal STEM Education Investments by Agency

FY2022 Number of STEM Education Investments by Agency
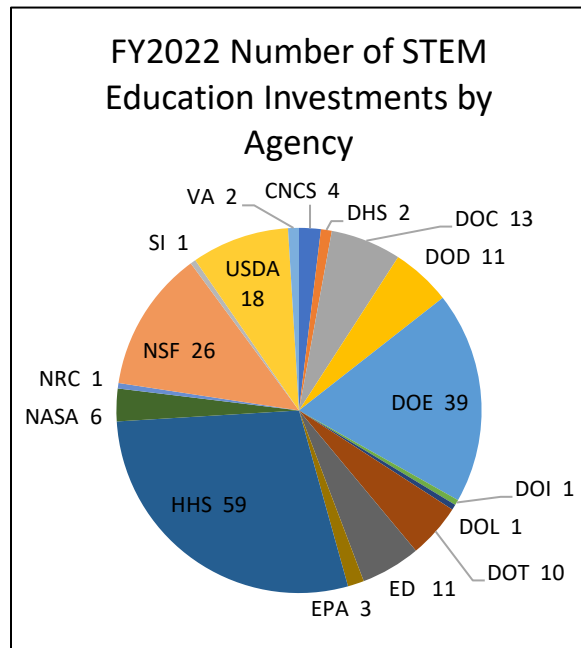
Figure 2. Federal STEM Education Budget (FY2022) by Agency

FY2022 Estimated Budget ($, millions)
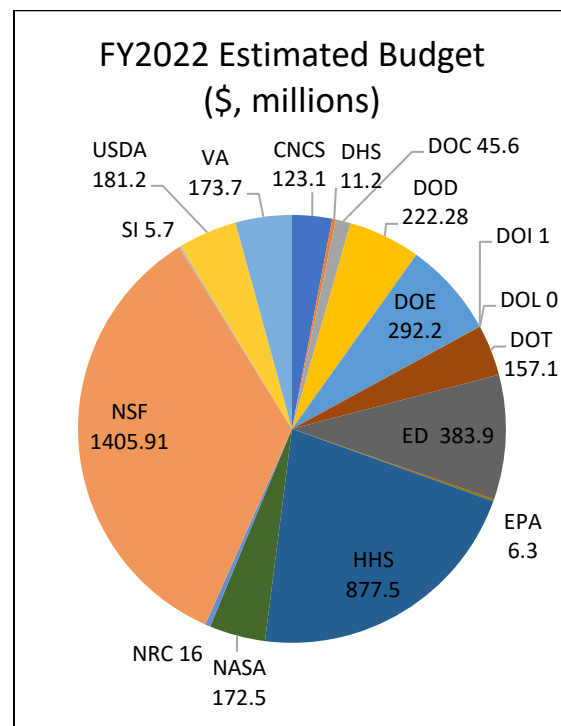
Figure 3 notes the Federal STEM Education Budget for FY21, estimated FY22 Budget, and FY23 President's Budget. Figure 3 also reflects the number of investments reflected in the 2022 Federal STEM Portfolio (Appendix 6).

Figure 3. Federal STEM Education Budgets (FY2021, FY2022, and FY2023)

Agency	Number of Programs in CoSTEM Inventory	FY 2021 Actual ($, million)	FY 2022 Estimated ($, million)	FY 2023 President's Budget ($, million)	Number of Programs Reflected in This Year's Portfolio (Reflecting FY21 Data)
CNCS	4	123.1	123.1	123.1	4
DHS	2	7.8	11.2	5.2	1
DOC	13	44.6	45.6	59.2	12
DOD	11	245	222.28	194.7	11
DOE	39	172.3	292.2	291.8	28
DOI	1	0.9	1	1	1
DOL	1	74	0	44	1
DOT	10	149.3	157.1	106.6	8
ED	11	372.5	383.9	277.2	9
EPA	3	2.9	6.3	6.3	3
HHS	59	830.6	877.5	867.6	44
NASA	6	157.5	172.5	196.5	6
NRC	1	19.4	16	0	0
NSF[170]	26	1354.3	1405.9	1595.0	24
SI	1	5.7	5.7	6	1
USDA	18	164.3	181.2	181.9	0[171]
VA	2	77.1	173.7	86.3	2
Grand Total	208	3801.3	4075.2	4042.4	156

[170] Not inclusive of American Rescue Plan funds; applies to NSF in Appendix 5 as well.
[171] Not a part of the summarized data in Appendix 4, however, 11 investments are reported in Appendix 6.

Most Federal investments were created before the creation of the 2018 Federal STEM Education Strategic Plan. Never the less, Figure 4 conveys where investments align directly or indirectly to the goals and pathways of the current Plan.

Figure 4. FY2021 Federal Investments by Goals and Pathways
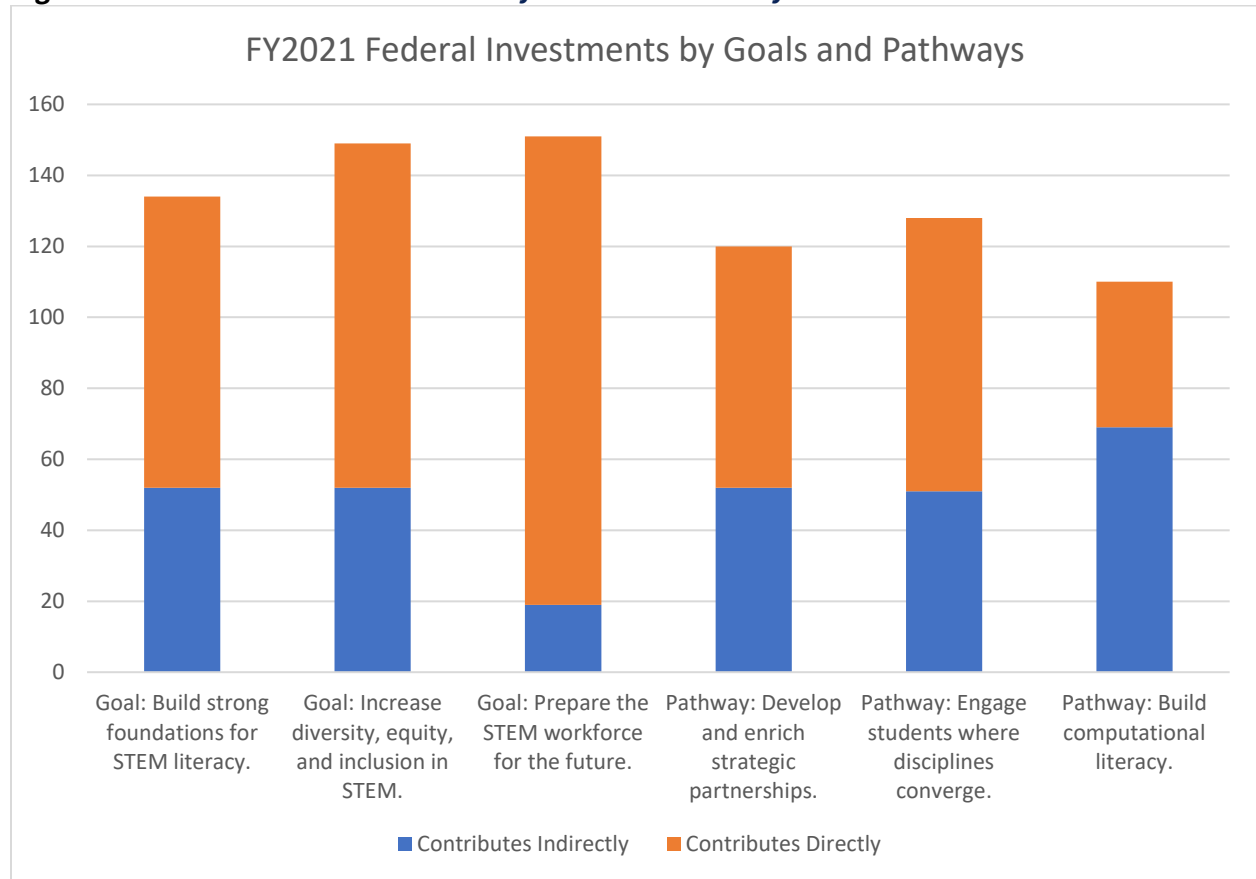
At some agencies, STEM education investments support formal and informal STEM education programming, STEM education research, and/or capacity-building opportunities to improve STEM interest and understanding and to foster a broader national STEM workforce. Other agencies may have investments that focus on mission-specific workforce education, which focuses on training a workforce directly related to an agency's mission (e.g., aerospace engineering, national security science, nuclear regulatory science) and/or developing an agency's future STEM workforce. These investments typically offer undergraduate internships, graduate scholarships, and/or capacity-building opportunities in fields tightly aligned to an agency's mission.

Using the categories found in the definition of a STEM education investment (found in Appendix 2), agencies reported on the primary and secondary objectives of their STEM education investments. Figure 5 captures the primary and secondary objectives of the investments across the CoSTEM portfolio. As seen in Figure 5, most Federal STEM education investments report STEM career preparation as one of their primary objectives.

Figure 5. FY2021 Federal Investments by Primary and Secondary Objectives
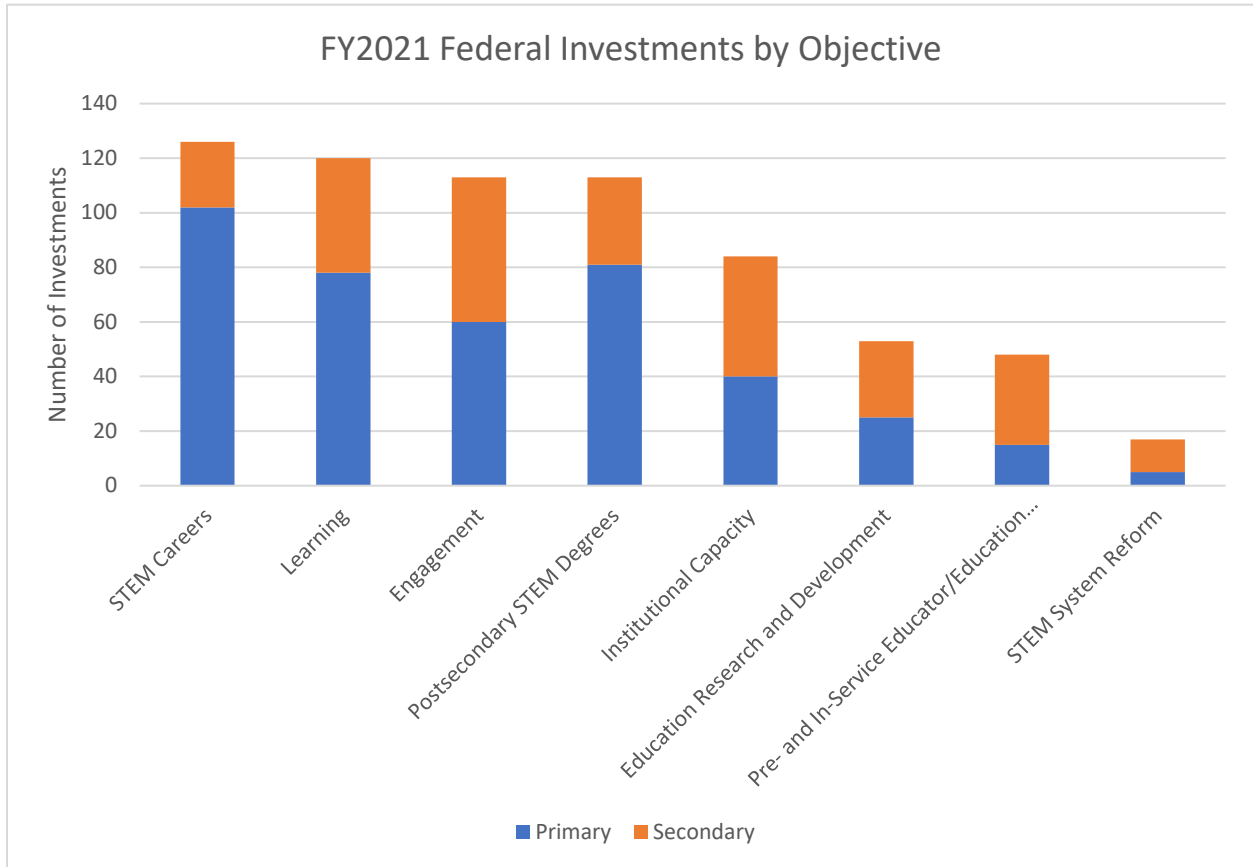
STEM education investments can cover a range of fields. This diversity reflects the wide range of disciplinary areas and/or transdisciplinary areas investments support, as seen in Figure 6.

Figure 6. FY2021 Federal Investments by Disciplinary/Transdisciplinary Area

FY2021 Federal Investments by Disciplinary/Transdisciplinary Area
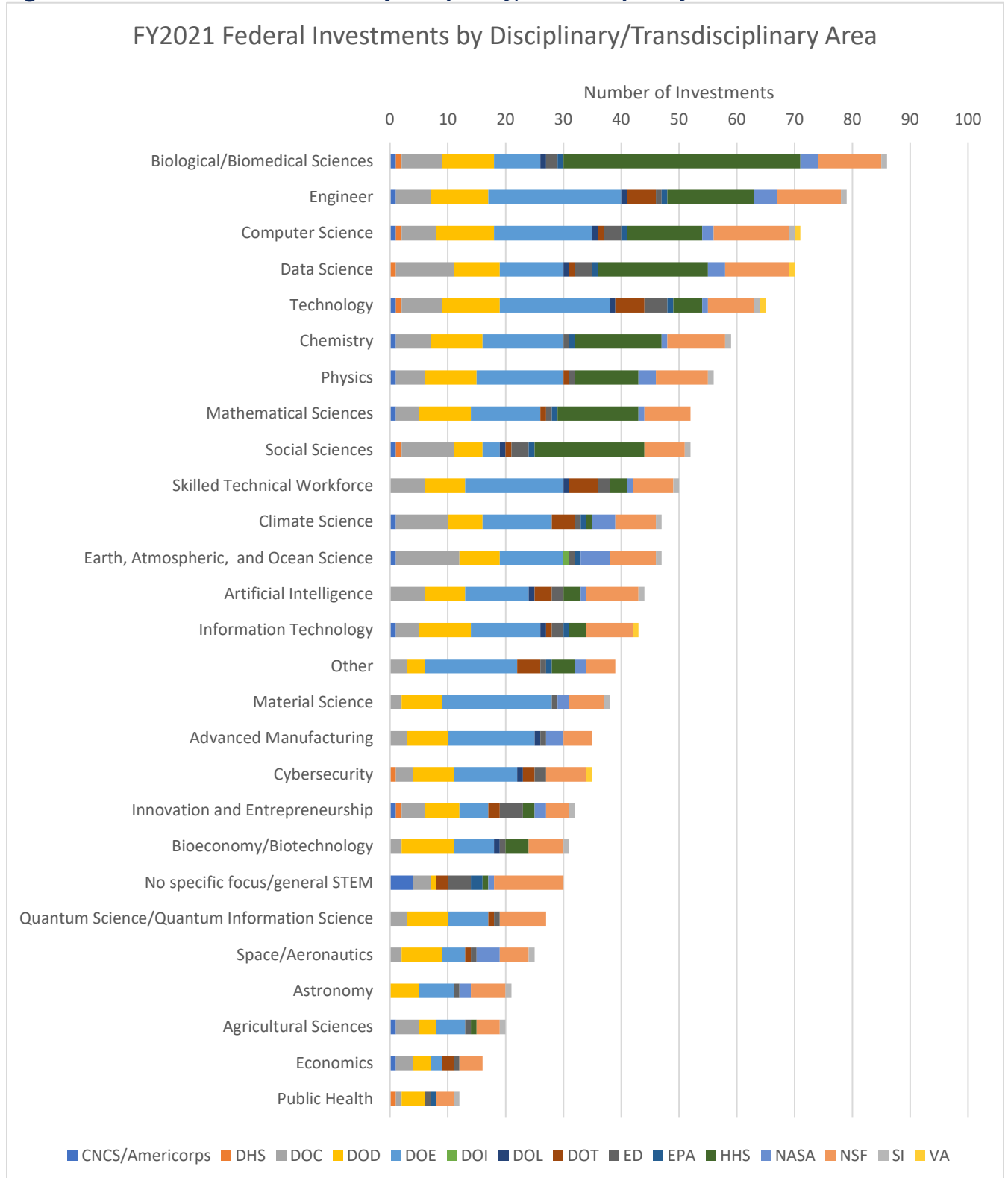
The types of funding support that investments provide are seen in Figure 7. This reflects some of the ways Federal investments interact with organizations and/or individuals directly through funding and/or programming. Figure 7 does not reflect the ways that Federal investments interact with organizations and/or individuals indirectly (for example, through informal activities, outreach efforts, and/or through the dissemination of resources).

Figure 7. FY2021 Federal Investments by Types of Funding

Figure 7. FY2021 Federal Investments by Types of Funding
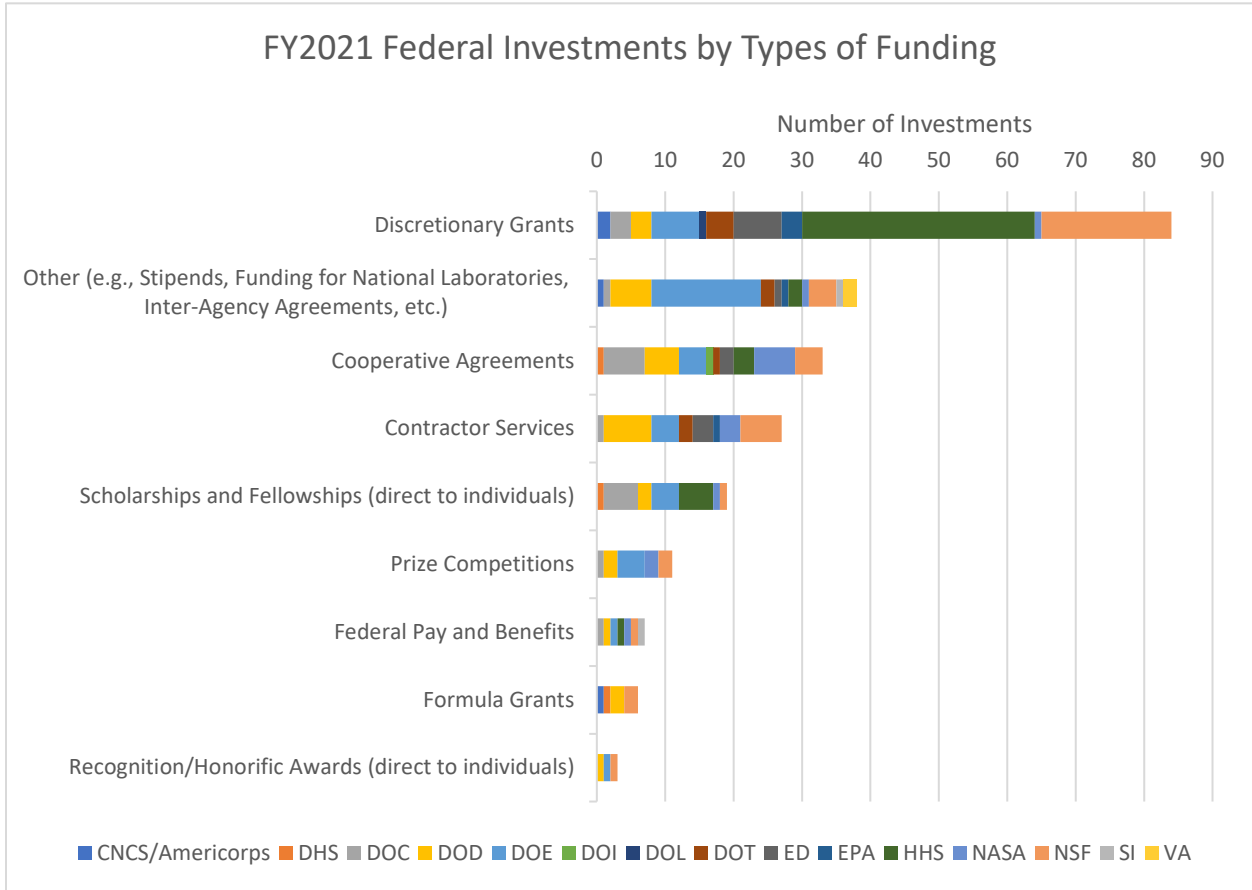
The types of organizations that participated with and/or were served by Federal investments are noted in Figure 8.

Figure 8. FY2021 Federal Investments by Participating Organizations /Organizations Served

FY2021 Federal Investments by
Participating Organizations/Organizations Served
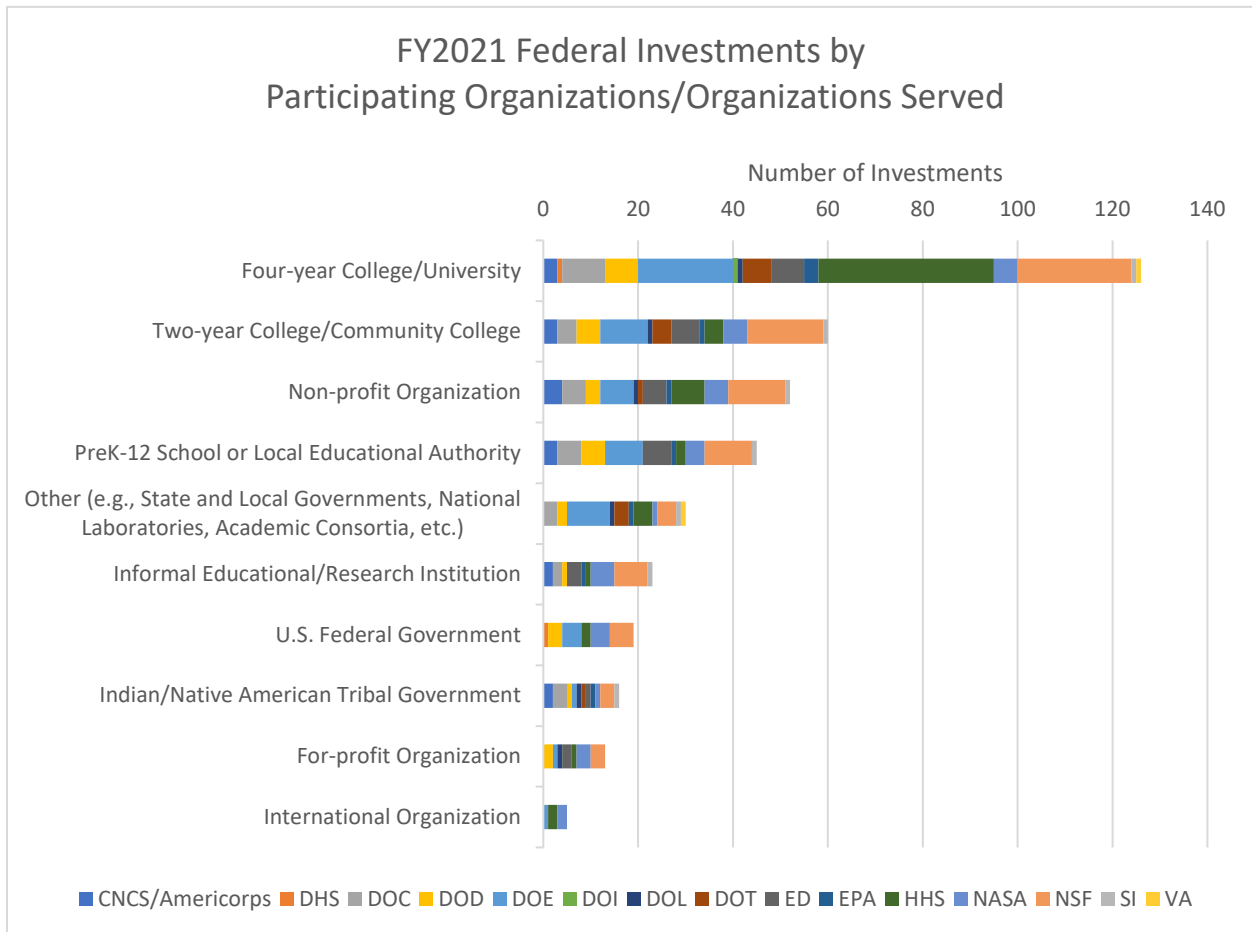
As noted in Figure 4, many investments directly or indirectly support the Strategic Plan's goal of increasing diversity, equity, and inclusion. Figure 9 notes investments that focus on organizations that serve underserved communities.

Figure 9. FY2021 Federal Investments with a Focus on Organizations that Serve Underserved Communities

FY2021 Federal Investments with Focus on Organizations that Serve Underserved Communities
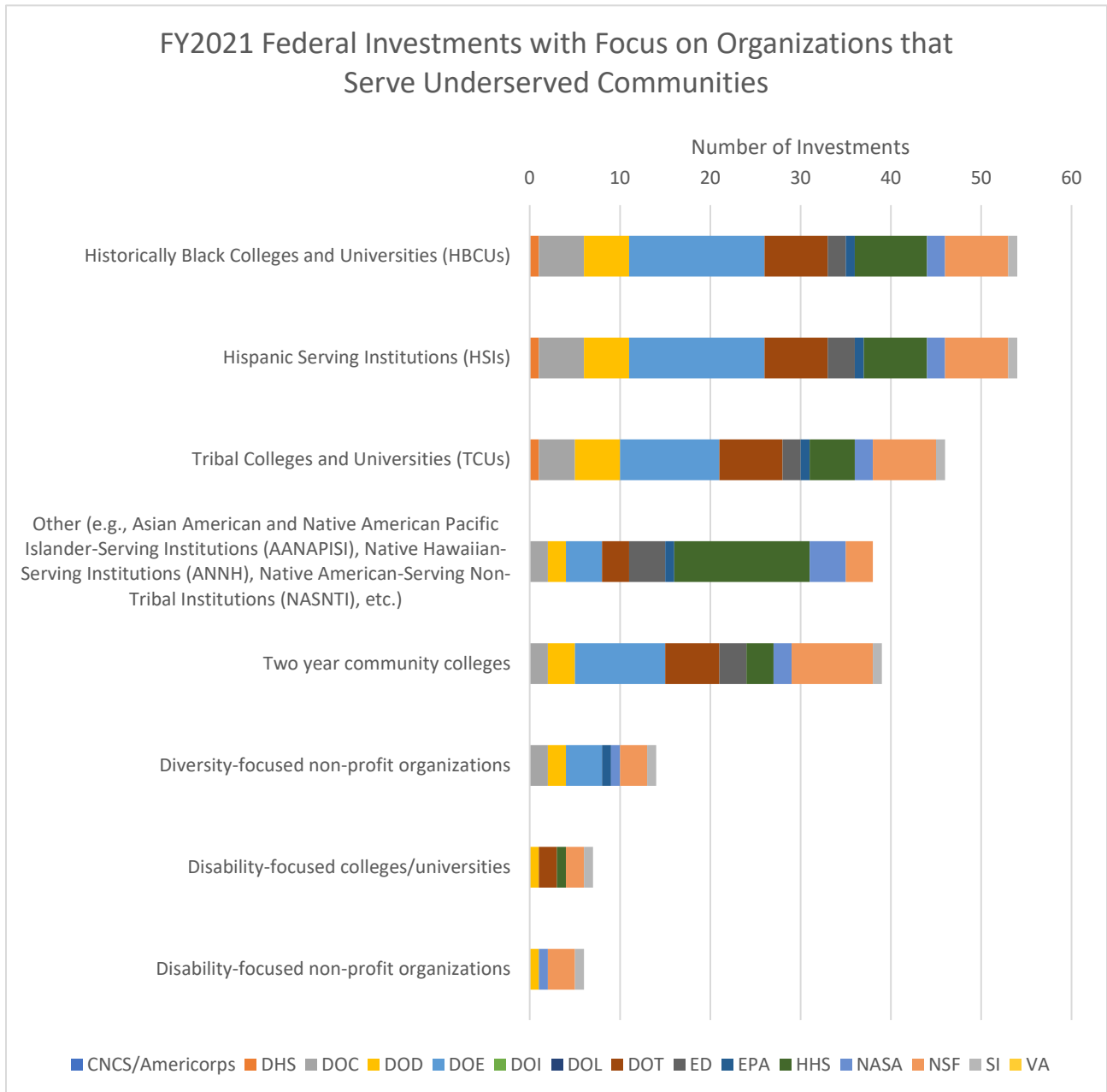
Of the two- and four-year organizations reported in Figure 8, Figure 10 shows whether the organization could have also been a Minority Serving Institution or related/similar organization.

Figure 10. FY2021 Federal Investments by Participating Organizations /Organizations Served, Specifically Minority Serving Institutions

FY2021 Federal Investments by Participating Organizations/Organizations Served (Specifically Minority Serving Institutions)
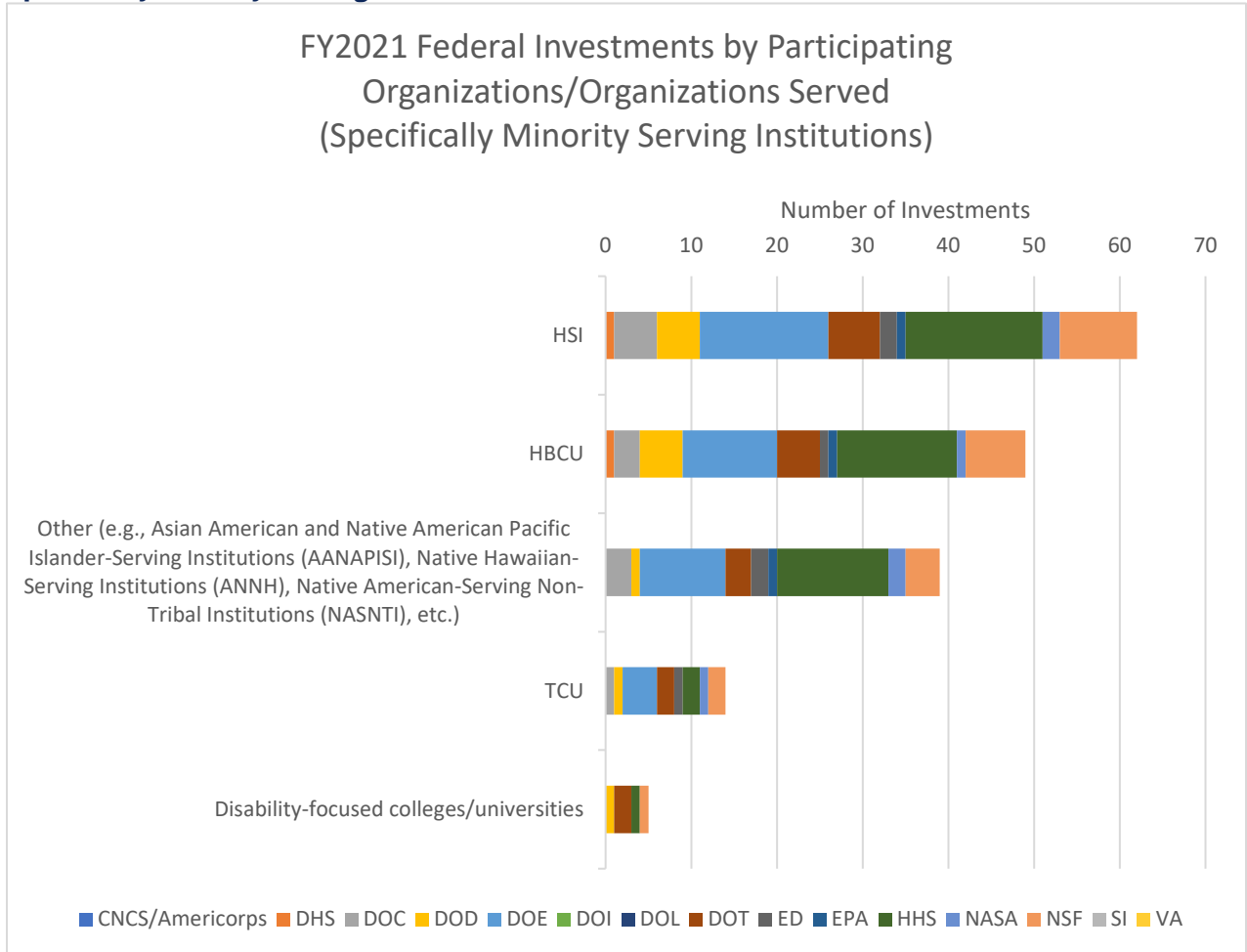
STEM education initiatives are often designed for many different audiences and often have to address the needs of multiple audiences. Individuals may directly or indirectly benefit from Federal STEM investments; for example, university faculty may receive a grant to provide professional development to teachers, and these teachers provide enhanced instruction to students. Agencies classify these individuals (i.e., university faculty and/or researchers, teachers, students, etc.) as primary/direct and/or secondary/indirect beneficiaries.

While CoSTEM/FC-STEM has guidance on how to define/classify a participant and how to determine whether a participant is a primary and/or secondary beneficiary (see Appendix 3), this guidance is still fairly new and therefore, it is not being used/applied consistently across all CoSTEM investments for reporting purposes. With more time, technical support, and continued reporting, OSTP expects increased use of the guidance and increased fidelity of the data. According to this year's data collection, the most frequently served participants among CoSTEM investments were postsecondary learners, as seen in Figure 11.

Figure 11. FY2021 Federal Investments by Types of Participants
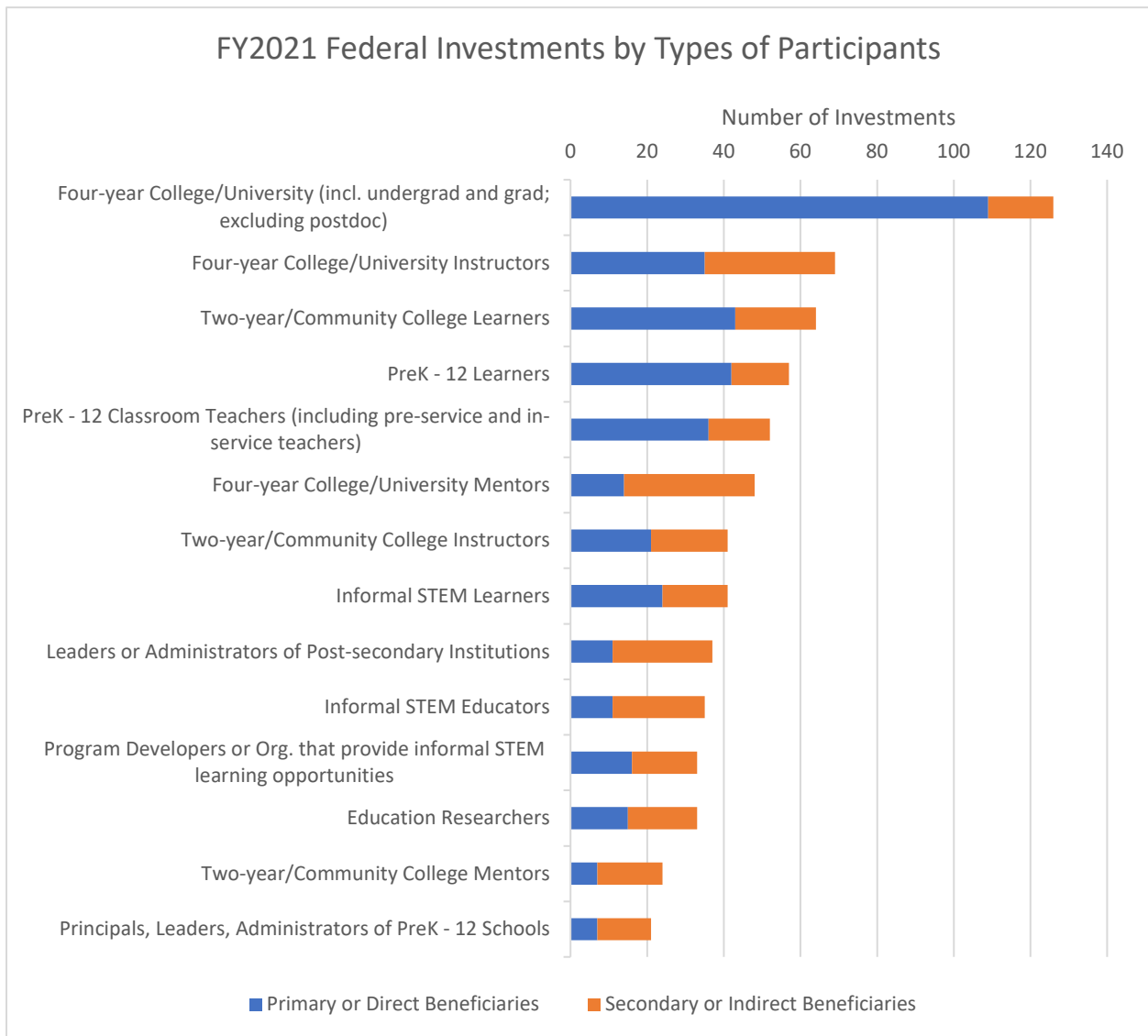
Figure 12 shows the same data from Figure 11 but by agency (investments) and Figure 13 notes investments that may have a focus supporting participants from underserved communities.

Figure 12. FY2021 Federal Investments by Types of Participants

FY2021 Federal Investments by Types of Participants
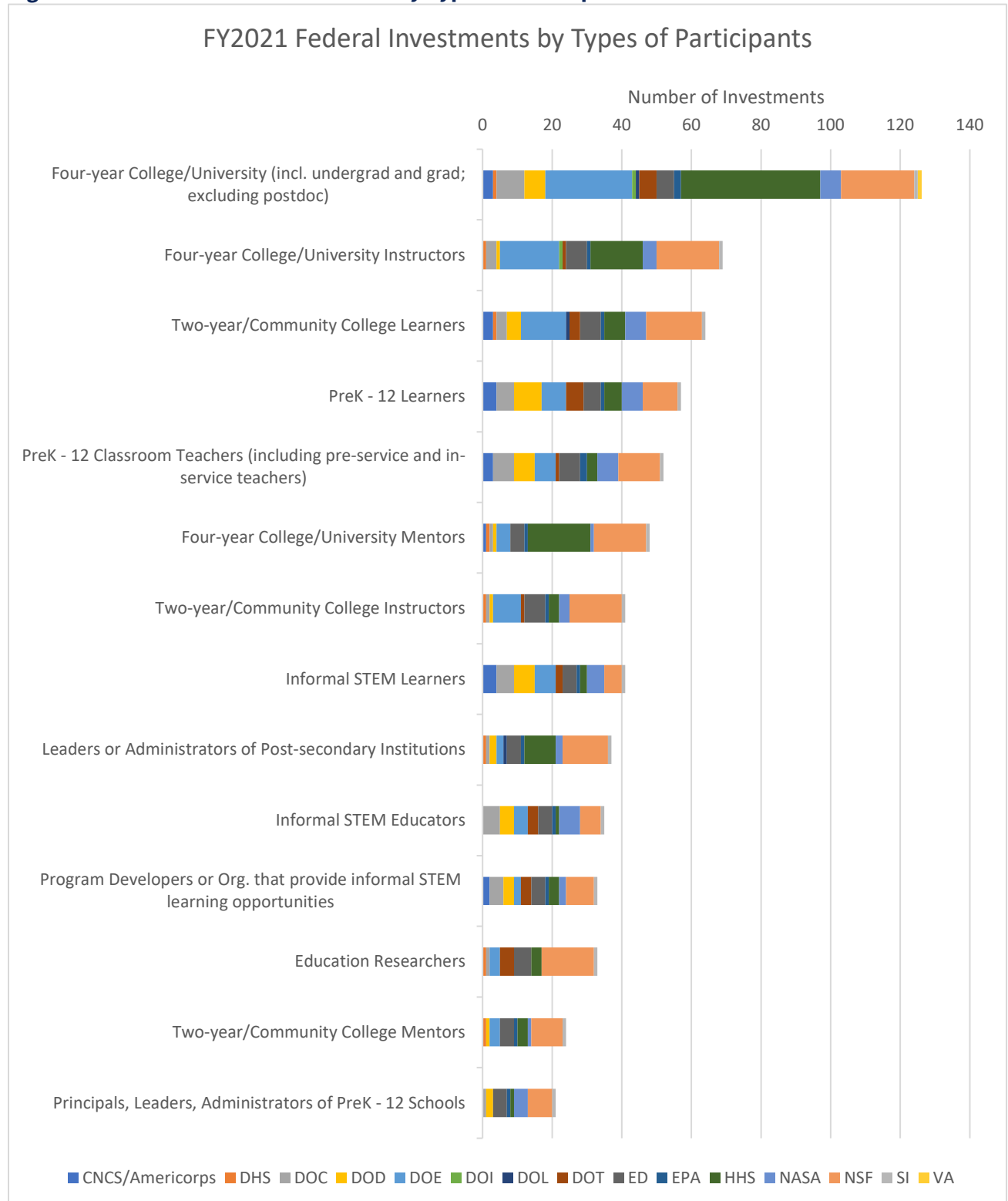
Figure 13. FY2021 Federal Investments with a Focus on Participants from Underserved Communities

FY2021 Federal Investments with Focus on Participants from Underserved Communities
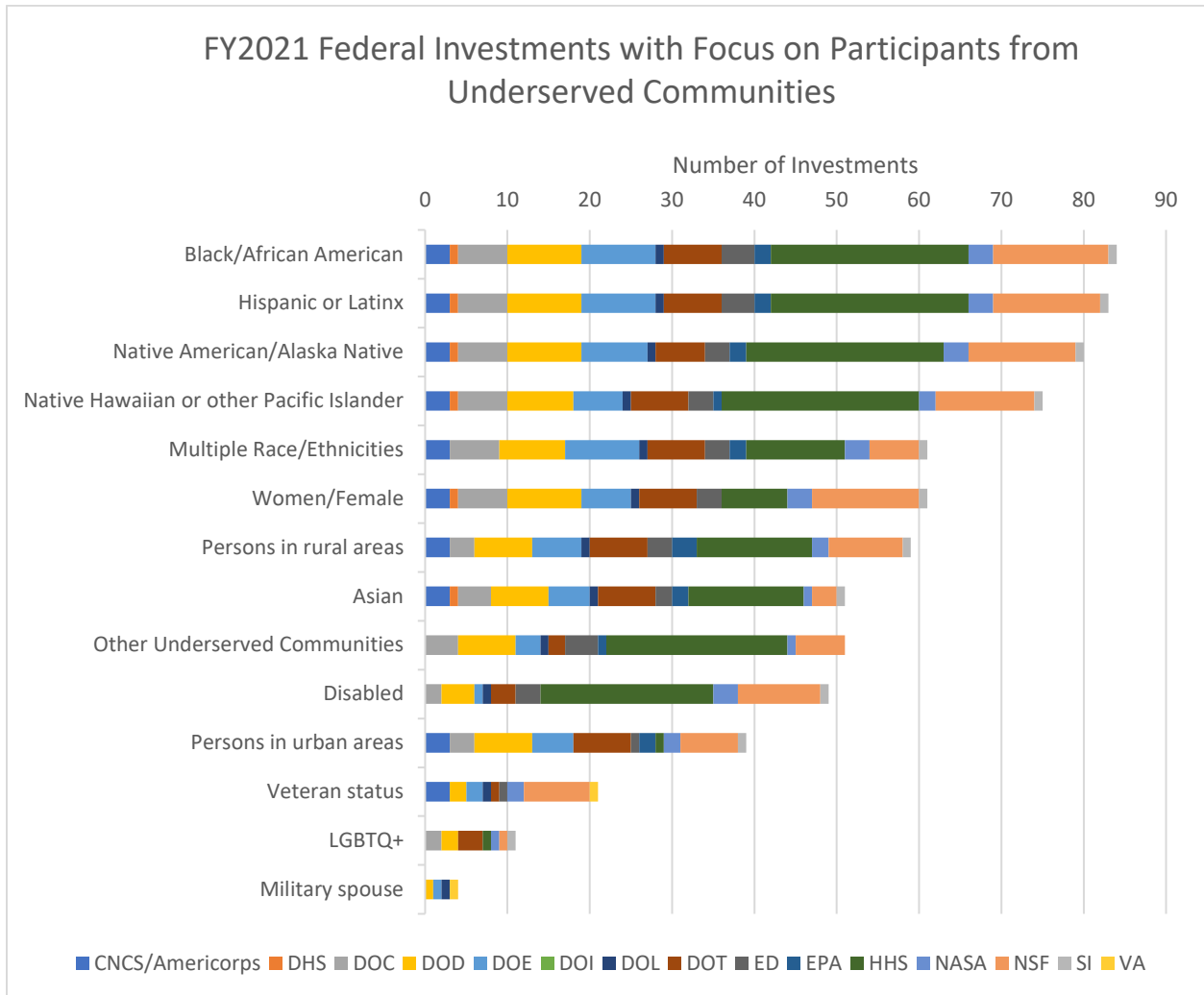
As noted in the Federal STEM Education Strategic Plan, in serving the American public, Federal agencies have a responsibility to provide broad access to their investments and to be accountable for ensuring that Federal activities are fully open and accessible to all members of the population. Collection and reporting on the participation of various groups in Federal STEM education investments provides agencies with opportunities to gauge their effectiveness at fostering diversity and inclusion. Tracking and reporting activities are essential to public accountability, legislative mandates, and supporting the Plan's goal to promote diversity, equity, and inclusion in STEM. More information can be found in Appendix 6 on the investments and/or agencies that collect and/or report participant data. There are other ways that agencies support diversity, equity, and inclusion, as seen in Figure 14. In this year's data call, at least 41% of CoSTEM investments reported measuring and/or assessing equitable program delivery and outcomes.

Figure 14. FY2021 Federal Investments by Approaches to Equitable Program Delivery and Outcomes
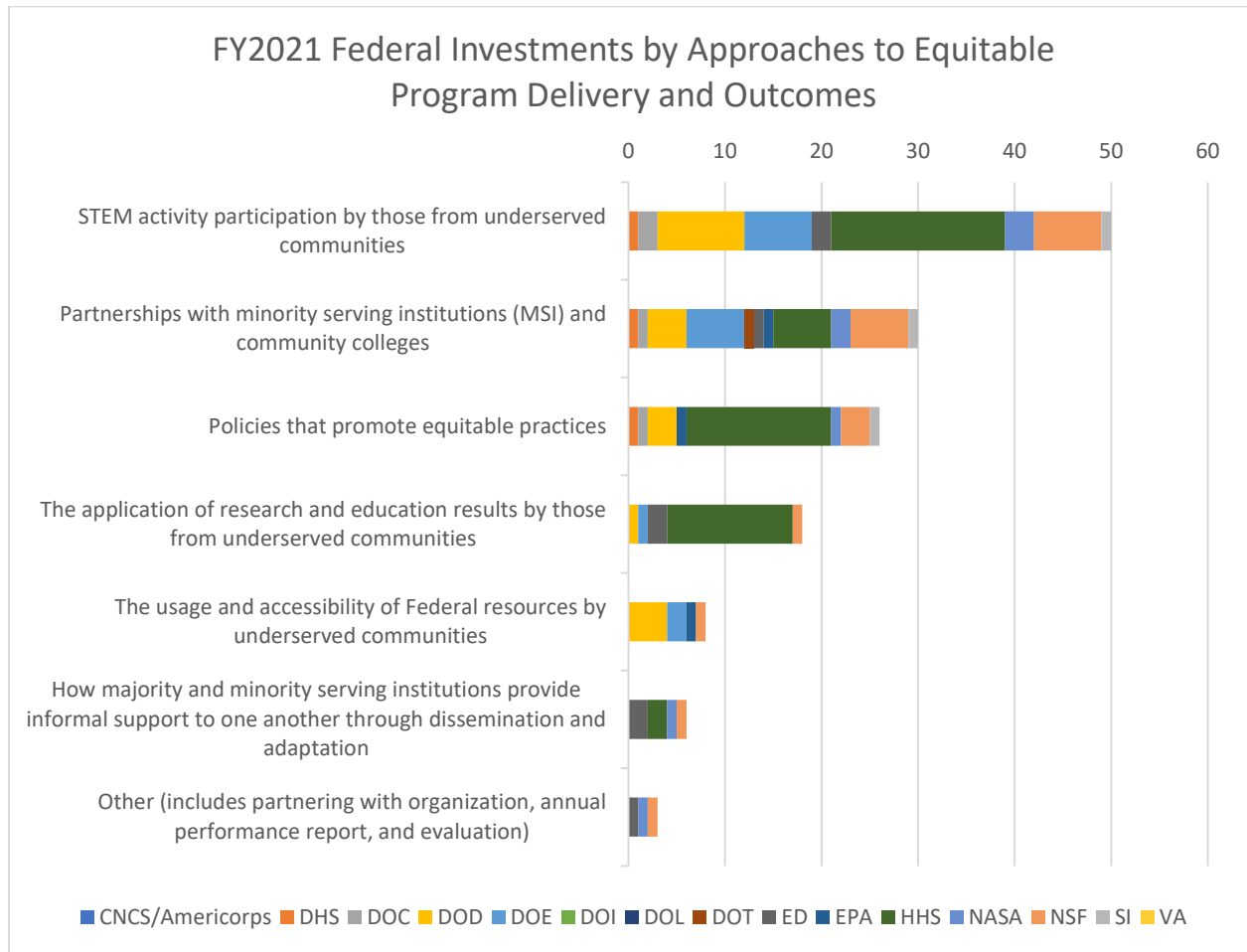
Again, mechanisms for data collection vary greatly across investments. During this year's data call, investments shared whether an evaluation was completed in FY21 and if a public report was available. It is important to note that in most cases, investments do not carry out program evaluations annually.

Figure 15 notes investments that completed a formal (independent) evaluation in FY2021 and/or if there are plans to do so in the future. As required by congressional mandate,

In FY21, most investments (over 60%) carried out some other type of assessment, in addition to or instead of a formal evaluation, such as focus groups, participant survey pre- and post-testing, an attitudinal survey, etc. These other types of assessments, which occur more frequently than formal evaluations, are not reflected in Figure 15.

Figure 15. FY2021 Federal Investments by Evaluations
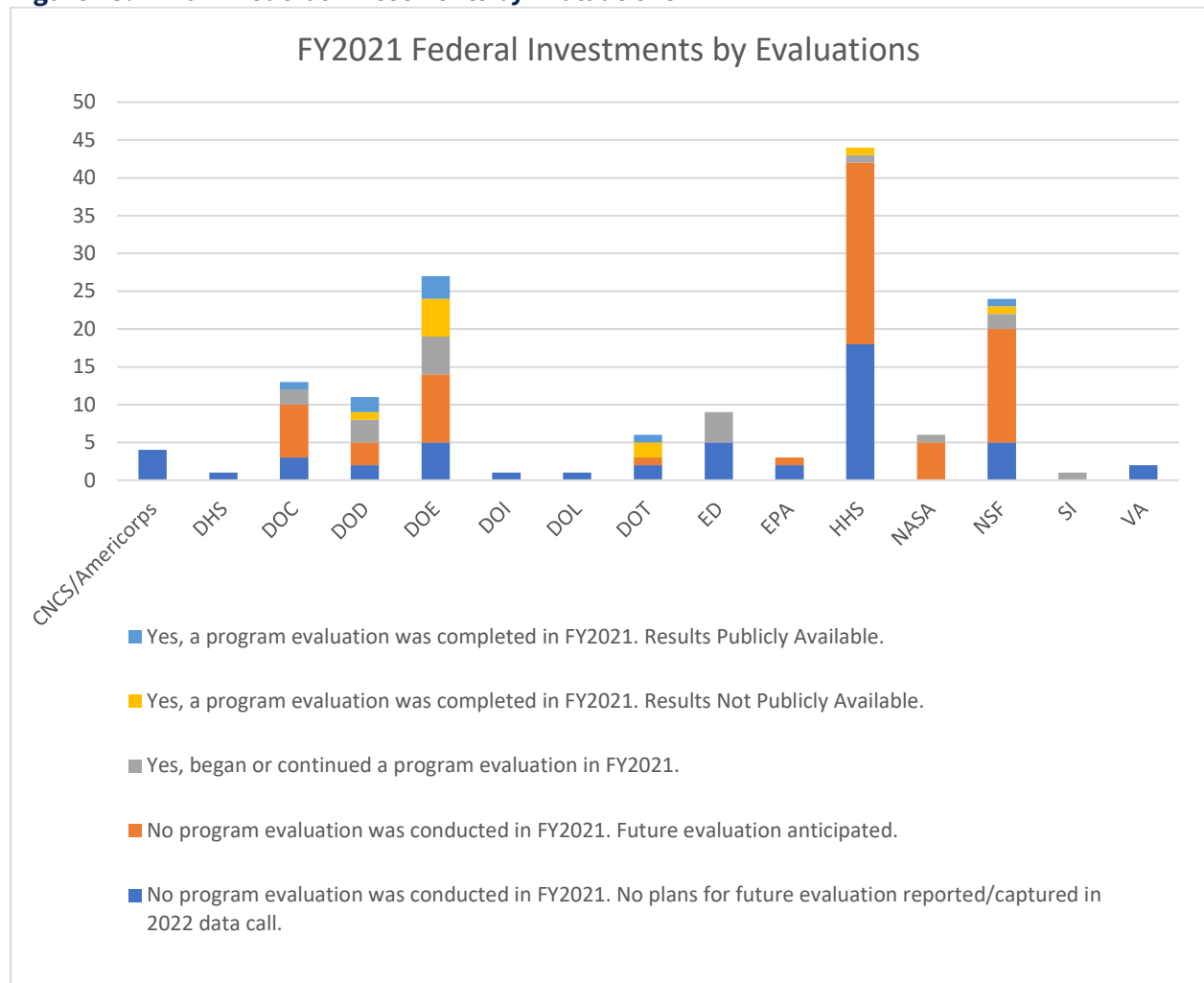
Specifics on investments can be found in Appendix 5 and 6.

Appendix 5. FY2022–Enacted Federal STEM Education Investment Inventory

Below is a list of STEM education investments and funding levels provided to OMB during its 2022 data call on Federal STEM education programs. Programs were included if they had any funding in FY 2021 or FY 2022. The inventory provided reflects investment consolidations and/or terminations in FY 2021. Investments with no new appropriations stayed on the inventory as remaining program funds are dispersed. Investments in the table below are alphabetized by Agency, then by Investment Name.

Agency	Sub-Agency	Name of Investment *(Budgets to the right are in the Millions)*	FY 21 Actual	FY22 Estimate	FY23 President's Budget
CNCS/ AmeriCorps		AmeriCorps NCCCC	0.7	0.7	0.7
CNCS/ AmeriCorps		AmeriCorps State & National (Competitive)	90.5	90.5	90.5
CNCS/ AmeriCorps		AmeriCorps State & National (Formula)	28.8	28.8	28.8
CNCS/ AmeriCorps		AmeriCorps VISTA	3.1	3.1	3.1
DHS		Educational Programs - Minority Serving Institutions	5.2	7.7	5.2
DHS		National Nuclear Forensics Expertise Development Program	2.6	3.5	0
DOC	EDA	STEM Talent Challenge	2	2	10
DOC	NIST	NIST Summer Institute for Middle School Science Teachers	0.3	0.3	0.3
DOC	NIST	STEM Pipeline for the Next Generation Scientists and Engineers with emphasis on the Graduate Student Measurement Science and Engineering (GMSE) Fellowship Program	0.7	1	1
DOC	NIST	Summer Undergraduate Research Fellowship Program	0.5	0.8	0.8
DOC	NOAA	Bay Watershed Education and Training (B-WET)	7.8	8.3	7.8
DOC	NOAA	Environmental Literacy Program (ELP)	2.7	2	5
DOC	NOAA	Ernest F. Hollings Scholarship Program	5.4	5.9	6.9
DOC	NOAA	José E. Serrano Educational Partnership Program with Minority Serving Institutions	20	20	23
DOC	NOAA	Margaret A. Davidson Graduate Fellowship	1.7	1.8	1.7
DOC	NOAA	Nancy Foster Scholarship Program [i]	0.6	0.7	0.9
DOC	NOAA	National Sea Grant College Program	1.5	1.7	1.7
DOC	NOAA	NOAA Teacher at Sea Program [i]	0.6	0.6	0.6
DOC	NOAA	Ocean Exploration Education and Internships	0.8	0.5	1
DOD[i]	DAF AFRL	Air and Space Force LEGACY	1.6	1.98	
DOD	DASA(R&T)	Army Educational Outreach Program (AEOP)	10.3	10.6	11.2
DOD	DAF	Dept of Air Force K-12 STEM Program	4.7	4.7	5.2
DOD	USD P&R, M&RA	DOD STARBASE Program	40.3	42	0
DOD	MDA	Inspiring Generations with New Ideas to Transform Education (IGNITE)	0.6	0.4	0.4
DOD	DTRA	Joint Science and Technology Institute (JSTI)	0.5	0	1
DOD	OUSD(R&E)	National Defense Education Program (NDEP) Science, Mathematics, and Research for Transformation Scholarship-for-Service Program	77	88.8	103.9
DOD	OUSD(R&E)	National Defense Education Program (NDEP) STEM Education and Outreach	60.1	23.3	26.4
DOD	OUSD(R&E)	National Defense Science and Engineering Graduate Fellowship Program (NDSEG)	45	45	45
DOD	DON	Naval Research Enterprise Internship Program (NREIP)	4.3	4.7	1.4
DOD	DON	Science and Engineering Apprenticeship Program (SEAP)	0.6	0.8	0.2
DOE	EERE	Advanced Vehicle Technology Competitions (AVTC)	3.2	3	4

Agency	Sub-Agency	Name of Investment *(Budgets to the right are in the Millions)*	FY 21 Actual	FY22 Estimate	FY23 President's Budget
DOE	IE	Alaska Resource Education (ARE) Energy Education and Outreach	0.6	0.6	0.6
DOE	EERE	Algae Technology Educational Consortium	0.9	1.1	0.8
DOE	EERE	Bioenergy Research and Education Bridge	0.1	0.6	0.5
DOE	EERE	Collegiate Wind Competition	0.9	1.3	2.5
DOE	SC-WDTS	Community College Internships (CCI) Program	1.9	2	2.2
DOE	SC-ASCR; NNSA	Computational Science Graduate Fellowship (CSGF)	12	17	17
DOE	CESER	CyberForce Competition	1.6	2.1	2.6
DOE	EERE	Frontier Observatory for Research in Geothermal Energy (FORGE)	4.5	4.5	5
DOE	FECM	HBCUs, Education, and Training	2.1	8	8
DOE	EERE	Inclusive Innovation Ecosystem Support (JOP)	0	0.5	0
DOE	EERE	Industrial Assessment Centers	11	15	0
DOE	SC NP	IP Traineeship [ii]	1	0	0
DOE	EERE	Jump Into STEM	1.9	0.9	0
DOE	SC BES	LCLS Internship Program	0.5	0.5	0.5
DOE	FECM	Micky Leland Fellowship Energy Fellowship Program	0.7	1	1
DOE	ED	Minority Educational Institution Student Partnership Program	1.5	1	2
DOE	EM	Minority Serving Institution Partnership Program (MSIPP)	6	6	6
DOE	NNSA	Minority Serving Institution Partnership Program (MSIPP) & including the Tribal Education Partnership Program (TEPP)	40	50	45
DOE	EM	MSI STEM, Manufacturing and Cybersecurity Consortium	0	50	50
DOE	SC-WDTS	National Science Bowl	2.9	2.9	3
DOE	NNSA	NNSA Graduate Fellowship Program (NGFP)	7.8	10.4	11.6
DOE	SC-BES, SC-DOE IP	Nuclear Chemistry Summer School (NCSS)	0.4	0.5	0.5
DOE	NNSA	Nuclear Nonproliferation International Safeguards Graduate Fellowship Program	0.7	0.8	0.8
DOE	SC-WDTS	Office of Science Graduate Student Research (SCGSR) Program	4.6	5	5
DOE	NNSA	Pit Production Workforce Development Partnership	7	10	0
DOE	SC	Reaching a New Energy Sciences Workforce (RENEW)	0	32	60
DOE	NNSA	Rickover Fellowship Program in Nuclear Engineering	1.2	1.4	1.4
DOE	NNSA	Savannah River Site Community Reuse Organization Workforce Opportunities in Regional Careers Program	1.4	1.2	1.4
DOE	SC-WDTS	Science Undergraduate Laboratory Internships	13.8	14	15
DOE	EERE	Solar Decathlon	2.0	3.2	3.2
DOE	EERE	Solar District Cup (aka DOE Collegiate Solar Districts Challenge, CPS # 34173)	0.3	0.6	0.8
DOE	NNSA	Stewardship Science Academic Alliances (SSAA)	26.2	27.5	24.2
DOE	SC-HEP	U.S. Particle Accelerator Training Program	0.8	1	1
DOE	FECM	University Coal Research (Renamed to University Carbon Research in FY23 Request)	3	5	5
DOE	NE	University Nuclear Leadership Program (UNLP)	5	6	6.5
DOE	SC-WDTS	Visiting Faculty Program (VFP)	1.8	2.1	2.1
DOE	EERE	Water Power STEM/Workforce	2	2.2	2.6
DOE	EERE	Wind for Schools	1	1.3	0
DOI	U.S. Geological Survey	The USGS National Cooperative Geologic Mapping Program (NCGMP) EDMAP Program	0.9	1	1
DOL	Employment and Training Administration	H-1B Skills Training Grants, specifically for year specified: H-1B Rural Healthcare Grant Program and H-1B One Workforce Grant Program	74	0	44

Agency	Sub-Agency	Name of Investment *(Budgets to the right are in the Millions)*	FY 21 Actual	FY22 Estimate	FY23 President's Budget
DOT	Federal Aviation Administration	Centers of Excellence Grant Program	70.3	57.6	0
DOT	Federal Highway Administration	Dwight D. Eisenhower Transportation Fellowship Program	1.8	2	2
DOT	Federal Railroad Administration	Encouraging Early (K-12) Interest in Railroad Careers through STEM Education	0	0	0.3
DOT	Federal Highway Administration	Garrett A. Morgan Technology and Transportation Education Program	0	1.3	0.4
DOT	Federal Railroad Administration	Making Railroading a Career of Choice through STEM Education	0.4	0.3	0.3
DOT	Federal Highway Administration	National Summer Transportation Institute	2.4	2.7	2.7
DOT		National UTCs on Congestion and Infrastructure [iii]	0	0	0
DOT	Federal Highway Administration	Summer Transportation Internship Program for Diverse Groups (STIPDG)	1.4	1.4	1.4
DOT		Tier 1 University Transportation Centers [iii]	0	0	0
DOT	Office of the Assistant Secretary for Research and Technology	University Transportation Centers Program	73	91.8	99.5
ED		Education Innovation and Research (EIR)	194	0	0
ED		Graduate Assistance in Areas of National Need (GAANN)	23.5	23.5	23.5
ED		Minority Science and Engineering Improvement Program (MSEIP)	13.4	14.5	18.4
ED		Out of School Time Career Pathway (OSTCP)	2.1	0	0
ED		Predominantly Black Institutions Competitive Grant Program	3.6	3.6	3.6
ED		Regional Educational Laboratories (REL)	2	5.5	5.5
ED		Research in Special Education	18.1	14.7	14.6
ED		Research, Development, and Dissemination (RDD)	45.7	47.8	45.7
ED		Teacher Loan Forgiveness	105	108	0
ED		Title III HSI STEM and Articulation Program	94.3	94.3	100
ED		Upward Bound Math and Science Program	64.8	72	65.9
EPA		Environmental Education Grant Program	1.3	3.3	3.3
EPA		National Environmental Education and Training Program	0.8	2.2	2.2
EPA		U.S. EPA's People, Prosperity, and the Planet (P3) Program	0.8	0.8	0.8
HHS	NIH	AD/ADRD Clinical Trials Short Course	0	0.8	0.8
HHS	NIH	Aging Research Dissertation Awards to Increase Diversity (R36 Clinical Trial Not Allowed)	1.1	1.6	1.4
HHS	NIH	Bridges to the Baccalaureate Research Training Program	8.5	8.3	9.3
HHS	NIH	Bridges to the Doctorate Program	1.5	1.4	0.2
HHS	NIH	Cancer Research Education Grants Program (R25)	17.6	20.6	21.4
HHS	NIH	Cancer Research Training Award (CRTA) Program	7.1	8.2	8.6
HHS	NIH	Center for Cancer Research Cancer/John Hopkins University Master of Science in Biotechnology Concentration in Molecular Targets and Drug Discovery Technologies [iii]	0	0	0

Agency	Sub-Agency	Name of Investment (Budgets to the right are in the Millions)	FY 21 Actual	FY22 Estimate	FY23 President's Budget
HHS	NIH	Diversity Research Education Grants in Neuroscience [iii]	0	0	0
HHS	NIH	Enhancing Science, Technology, EnginEering, and Math Education Diversity (ESTEEMED) Research Education Experiences (R25)	1.9	2.8	3.2
HHS	NIH	Fogarty Global Health Training Program	1	1.4	1.4
HHS	NIH	Graduate Partnerships Program	13.4	14.1	14.7
HHS	NIH	Graduate Research Training Initiative for Student Enhancement (G-RISE)[iv]	2.2	5.5	16.0
HHS	HRSA	Health Careers Opportunity Program	14.4	15.5	18.5
HHS	NIH	Health Careers Opportunity Program	1.6	0.7	0.1
HHS	NIH	Initiative for Maximizing Research Education in Genomics; Diversity Action Plan	2.8	2.8	3.1
HHS	NIH	Initiative for Maximizing Student Development	13.7	8.6	3.8
HHS	NIH	Mathematics and Science Cognition and Learning (MSCL) Program	7.3	7.3	7.7
HHS	NIH	Maximizing Access to Research Careers (MARC)	18.8	15.6	16.4
HHS	NIH	MSTEM: Advancing Diversity in Aging Research through Undergraduate Education (R25 - Independent Clinical Trial Not Allowed)	6.9	8.7	10.4
HHS	NIH	National Library of Medicine Institutional Training Grants for Research Training in Biomedical Informatics and Data Science	11.5	10.5	10.5
HHS	NIH	NCI Predoctoral to Postdoctoral Fellow Transition Award	1.9	2.1	3.2
HHS	NIH	NIA Research and Entrepreneurial Development Immersion (REDI): Entrepreneurship Enhancement Award	1.9	5	6.8
HHS	NIH	NIDA Research Education Program for Clinical Researchers and Clinicians	5.2	5.8	6.3
HHS	NIH	NIDDK Education Program Grants (R25 Clinical Trial Not Allowed) PAR-21-034	0.9	1.8	1.8
HHS	NIH	NIH Blueprint and BRAIN Initiative Diversity Specialized Predoctoral to Postdoctoral Advancement in Neuroscience (D-SPAN) Award [iii]	0	0	0
HHS	NIH	NIH Blueprint Enhancing Neuroscience Diversity through Undergraduate Research Education Experiences (ENDURE)	3.8	3.9	4.2
HHS	NIH	NIH Building Infrastructure Leading to Diversity (BUILD) Initiative (RL5 portion only)	7.0	5.9	4.6
HHS	NIH	NIH Building Infrastructure Leading to Diversity (BUILD) Initiative (TL4 portion only)	8.1	8.4	4.8
HHS	NIH	NIH Neuroscience Development for Advancing the Careers of a Diverse Research Workforce	3.8	4.1	4.7
HHS	NIH	NIMHD Minority Health and Health Disparities International Research Training (T37)	3.2	2.1	3.5
HHS	NIH	Office of Intramural Training and Education (OITE)	0.3	0.3	0.3
HHS	NIH	Oxford-Cambridge Scholars Program (Ox/Cam)	0.3	0.4	0.4
HHS	NIH	P30 CURE Supplement	0.1	0	0
HHS	NIH	Postbaccalaureate Intramural Research Training Award Program	59.6	62.9	65.7
HHS	NIH	Postbaccalaureate Research Education Program (PREP)	13.3	14.5	15
HHS	NIH	Programs to Increase Diversity Among Individuals Engaged in Health-Related Research (PRIDE)	4.1	4.1	2.9
HHS	NIH	Providing Research Education Experiences to Enhance Diversity in the Next Generation of Substance Use and Addiction Scientists (R25 Clinical Trials Not Allowed)	2.4	2.9	3.4
HHS	NIH	Research Initiative for Scientific Enhancement (RISE)	15.8	9.1	4.7
HHS	NIH	Research Supplements to Promote Diversity in Health-Related Research	56.8	56.8	56.8
HHS	NIH	Ruth L. Kirschstein National Research Service Award Institutional Research Training Grants (T32, T35)	328.5	358.7	371.1

Agency	Sub-Agency	Name of Investment (Budgets to the right are in the Millions)	FY 21 Actual	FY22 Estimate	FY23 President's Budget
HHS	NIH	Ruth L. Kirschstein NRSA for Individual Predoctoral Fellows, including Underrepresented Racial/Ethnic Groups, Students from Disadvantaged Backgrounds, and Predoctoral Students with Disabilities	121.2	131.8	128.6
HHS	NIH	Science Education Partnership Award	31.1	32.1	34.1
HHS	NIH	Short Courses on Interdisciplinary Behavioral and Social Sciences Research on Aging	0	0.5	0.5
HHS	NIH	Short Courses on Interdisciplinary Behavioral and Social Sciences Research on Alzheimer's Disease and Related Dementias	0	0.5	0.5
HHS	NIH	Short Courses on Mathematical, Statistical, and Computational Tools for Studying Biological Systems [iii]	0	0	0
HHS	NIH	Short-Term Research Education Program to Enhance Diversity in Health-Related Research	5	5.3	3.9
HHS	NIH	Short-Term Research Experience Program to Unlock Potential	1.3	1.4	1.4
HHS	NIH	Strengthening Institutional Capacity to Conduct Global Cancer Research in Low-and Middle-Income Countries	1.1	2.1	0.3
HHS	NIH	Student Intramural Research Training Award Program	5.7	6	6.2
HHS	NIH	Substance Use/Substance Use Disorder Dissertation Research Award (R36 - Clinical Trials Optional)	0.5	0.4	0.5
HHS	NIH	Summer Institute for Research Education in Biostatistics and Data Science	1.5	2.2	2.2
HHS	NIH	Summer Research Education Experience Program	5.7	5.7	6
HHS	NIH	Team-Based Design in Biomedical Engineering Education (R25) [iii]	0.7	0.9	0.9
HHS	NIH	UMD-NCI Partnership for Integrative Cancer Research	0.9	1	1
HHS	NIH	Undergraduate Research Education Program (UP) to Enhance Diversity in the Environmental Health Sciences	1	1	0.9
HHS	NIH	Undergraduate Research Training Initiative for Student Enhancement (U-RISE) [iv]	5.4	12.1	18.4
HHS	NIH	Undergraduate Scholarship Program	5.3	5	5.4
HHS	NIH	Undergraduate Summer Research Education in Kidney, Urologic, and Hematologic Diseases; solicited via two funding announcements: RFA-DK-13-005 and RFA-DK-18-006	3.6	3.7	3.6
HHS	NIH	Werner H Kirsten Student Internship Program	0.6	1.1	1.1
NASA		Minority University Research and Education Project (MUREP)	38	43	48
NASA		National Space Grant College and Fellowship Project (Space Grant)	51	54.5	57
NASA		Next Gen STEM	12	13.5	19
NASA		Robotics Alliance Project (RAP)	4	4	5
NASA		Science Activation Program	45.6	50.6	55.6
NASA		The Global Learning and Observations to Benefit the Environment (GLOBE) Program	6.9	6.9	11.9
NRC		University Nuclear Leadership Program	19.4	16	0
NSF		Advanced Technical Education	76.5	75	75
NSF		Advancing Informal STEM Learning (AISL)	62.5	65	74.5
NSF		CS for All: Research and RPPs	24.6	24.5	24.5
NSF		Cybercorps: Scholarship for Service (SFS)	60	63	75
NSF		Discovery Research PreK-12	95	98.5	99.5
NSF		EDU Core Research (ECR) Program	76.63	80.91	101.94
NSF		Emerging Frontiers in Research and Innovation (EFRI) Research Experience and Mentoring (REM)	0.9	1	1
NSF		Excellence Awards in Science and Engineering (EASE)	3.6	7.4	7.7
NSF		Graduate Research Fellowship Program (GRFP)	284.5	290	355.5
NSF		Harnessing the Data Revolution (HDR): Data Science Corps (DSC)	7.48	3	3
NSF		Historically Black Colleges and Universities Undergraduate Program	36.5	38	48.5

Agency	Sub-Agency	Name of Investment (Budgets to the right are in the Millions)	FY 21 Actual	FY22 Estimate	FY23 President's Budget
NSF		Improving Undergraduate STEM Education: Directorate for STEM Education (IUSE: EDU)	99.2	106.5	108.7
NSF		Improving Undergraduate STEM Education: Hispanic Serving Institutions	46.5	48.5	60.5
NSF		Inclusion across the Nation of Communities of Learners of renamed INCLUDES Initiative)	20.8	23	50.5
NSF		Innovative Technology Experiences for Students and Teachers (ITEST)	51.8	40.6	39.7
NSF		International Research Experience for Students	12.3	7.0	10
NSF		Louis Stokes Alliances for Minority Participation	49.5	51.5	70.5
NSF		NSF Alliances for Graduate Education and the Professoriate Program	8	8.5	14
NSF		NSF Research Traineeships (NRT)	58	60	62.5
NSF		Research Experiences for Teachers (RET) in Engineering, Computer Science, and Biology	8.2	6.3	13.2
NSF		Research Experiences for Undergraduates (REU)	85.5	83.3	84.1
NSF		Robert Noyce Teacher Scholarship Program	67.6	67	67
NSF		Scholarships in Science, Technology, Engineering and Math (S-STEM) core program	94.7	121.9	119.2
NSF		STEM+C Partnerships [v]	0	0	0
NSF		Training-based Workforce Development for Advanced Cyberinfrastructure (CyberTraining)	7.5	18	6
NSF		Tribal Colleges and Universities Program (TCUP)	16.5	17.5	23
Smithsonian Institution		STEM Informal Education and Instruction	5.7	5.7	6
USDA	NIFA	1890 Facilities Grant Program	21.5	21.5	21.5
USDA	NIFA	1890 Institutions Capacity Building Grants Program: Extension	8.7	8.7	8.7
USDA	NIFA	1890 Institutions Capacity Building Grants Program: Teaching	8.7	8.7	8.7
USDA	NIFA	1890 National Scholars Program	10	10	10
USDA	NIFA	4-H Science, 4-H Youth Development Program	26.6	27.1	27.1
USDA	APHIS	AgDiscovery	0.6	1	1.2
USDA	NIFA	Agriculture in the Classroom	0.6	1	1
USDA	NIFA	Alaska Native-Serving and Native Hawaiian-Serving Institutions Education Competitive Grants Program	3.2	4	3.2
USDA	NIFA	Hispanic serving Institutions Education Grants Program	12.5	14	14
USDA	APHIS	Historically Black Colleges/Universities Vet Tech Programs	0.8	0.8	0.8
USDA	NIFA	Insular Programs	2	2	2
USDA	NIFA	Multicultural Scholars, Graduate Fellowship and Institution Challenge Grants	9.5	10	10
USDA	NIFA	New Era Rural Technology Competitive Grants Program (RTP) [iii]	0	0	0
USDA	NIFA	NIFA Fellowship Grants Program	58	70	70
USDA	NIFA	Secondary Postsecondary Agriculture Education Challenge Grants (SPECA)	0.9	1	1
USDA	APHIS	Tribal College/University Curriculum Enhancement - Funding provided to Navajo Technical University to assist with strengthening its Veterinary Technology	0.1	0.1	0.1
USDA	APHIS	USDA-APHIS "Safeguarding Natural Heritage: Strengthening Youth Connections to the Land" Summer Enrichment Program	0.2	0.3	0.3
USDA	NIFA	Women and Minorities in Science, Technology, Engineering and Mathematics Fields Program (WAMS)	0.4	1.0	2.3
Veterans Affairs		Rogers STEM Scholarship	39.1	39.6	41.3

Agency	Sub-Agency	Name of Investment *(Budgets to the right are in the Millions)*	FY 21 Actual	FY22 Estimate	FY23 President's Budget
Veterans Affairs		VET TEC	38	134.1	45

[i] Reflected in Appendix 4 but not 6; no participants due to COVID in FY21.

[ii] The IP Traineeship becomes part of RENEW in FY2023.

[iii] Investment has been terminated.

[iv] The G-RISE budget is also included in NIH-wide T32 budget.

[v] Investment terminated; replaced by CSforAll.

Appendix 6. FY2021 Federal STEM Education Portfolio

As noted in Appendix 4, the *America COMPETES Reauthorization Act of 2010* calls for OSTP to establish, maintain, and periodically update an inventory of federal investments in science, technology, engineering, and mathematics (STEM) education as part of a five-year federal STEM education strategic plan.

In accordance with the *America COMPETES Act*, individual budget data for FY21, FY22, FY23 are captured and reflected in Appendix 5.

Appendix 6 provides further information about the Federal STEM education portfolio by investment in support of requirements in the *America COMPETES Reauthorization Act of 2010*. The information in Appendix 6 was derived from an OSTP-led data call to CoSTEM/FC-STEM agencies in early 2022. Through the data call, agencies selected best-fit responses to questions about each investment's:
- primary CoSTEM objective(s);
- alignment to the 2018 Federal STEM Education Strategic Plan goals and pathways;
- funding mechanisms;
- types of organizations served;
- types of participants/individuals served (directly and/or indirectly);
- number of participants served, and the number and/or percentage of participants from different demographic groups (if collected and/or reportable);
- way of determining participant locality/rural status; and
- publicly available evaluation reports completed in FY21.

Investments are alphabetized in the table below by Agency, then by Investment Name. Some Investment names in the table below are hyperlinked, taking readers to the investment's home page/general website in most cases.

In serving the American public, Federal agencies have a responsibility to provide broad access to their investments and to be accountable for ensuring that Federal activities are open and accessible to members of the population. Collection and reporting on the participation of various groups in Federal STEM education programs provides agencies with opportunities to gauge their effectiveness at fostering diversity and inclusion. These tracking and reporting activities are essential to public accountability, legislative mandates, and to supporting the Plan's goal to promote diversity, equity, and inclusion in STEM. See Appendix 3 for more information regarding ways CoSTEM/FC-STEM agencies can designate a participant to support reporting purposes. Appendix 3 also contains information on the potential barriers or challenges investments may face that preclude them from collecting and/or reporting demographic and/or participant data. When possible, links to investment-level or agency-level reports, dashboards, and/or websites have been provided. Please note for any investments and/or agencies that did provide demographic information, most often demographic information about participants is based on self-reported data and not all participants choose to disclose this information. Any results that are shared below must be interpreted with caution due to the issue of non-responses. Due to varying agency/investment collection and reporting processes/practices, non-responses may or may not have been included in the numbers and/or percentages below.

Mechanisms for data collection vary greatly across investments. If conducted and when possible, investments shared whether their program finished a formal evaluation this year and when available, provided a link to the publicly available evaluation report. Instead of and in most cases, investments,

outside of a formal program evaluation, carried out other types of assessments – such as a focus groups, participant survey pre- and post-testing, an attitudinal survey, for example, but these assessments are not reflected below. (For more information about evaluations conducted in FY21 across the Federal STEM education portfolio, including those that are planned or ongoing, please see Figure 15 in Appendix 4.) The last column in the table below fulfills congressional mandates to provide when available public reports from evaluations completed from the previous year (i.e. FY21).

Based on an analysis of the FY2021 STEM education investments, where primary objectives, audiences, and STEM fields were considered, most investments were found not to be duplicative. In the case of four investments that appeared to have incidents of overlap, additional review of data provided within the data call provided evidence of characteristics that distinguished the investments from another.

Table Legend/Abbreviations:

Columns on Goal and Pathway Alignment
D: indicates a major outcome of the STEM investment contributes directly to, or progress towards the attainment of the goal or pathway.
I: indicates a 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.
U: indicates the anticipated outcomes of the investment are unlikely to contribute, directly or indirectly, to achieve the goal or pathway.

Columns on Participants or Race and Ethnicity
G: Gender
R/E: Race and Ethnicity
W: White
A: Asian
AA: Black or African American
NA/AN: American Indian or Alaska Native
H/L: Hispanic or Latino/a
NH/PI: Native Hawaiian or Other Pacific Islander
MR/E: More than One Race/Ethnicity

Other Columns
NC: Not Collected
C/NR: Collected but Not Reportable
PRA: Persons in Rural Areas [By Zip Code, By Locality (City, etc.), or By SOM (Some Other Measure)]
PUA: Persons in Urban Areas
NPR: No Public Report

Agency	Sub-Agency	Name of Investment	Primary CoSTEM Objective(s)	Goal: STEM literacy	Goal: Diversity, equity, inclusion in STEM.	Goal: STEM workforce of future	Pathway: Strategic partnerships	Pathway: Disciplines converge	Pathway: Computational literacy	Types of Funding	Types of Organizations Served/Funded	Types of Participants (Direct and/or Indirect)	Total # of Participants in FY21	Total # of Participants in FY21 with Demographic Information	% of Participants by Race/Ethnicity (from participants who reported demographic data)	%Female Participants (from participants who reported demographic data)	Participant Locality collected by:	Evaluations Publicly Released in FY21
CNCS/ Ameri Corps		AmeriCorps NCCCC	Learning	U	U	U	U	U	U	Other	Non-profit Organization	PK-12 Learners, Informal STEM Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.					NPR
CNCS/ Ameri Corps		AmeriCorps State & National (Competitive)	Engagement, Learning	D	D	D	I	D	D	Discretionary Grants	PK-12 School, 2YR/ Community College, 4YR College/ University, Informal Educational/ Research Institution, Indian/Native American Tribal Government, Non-profit Organization	PK-12 Learners, Pk-12 Teachers, 2YR College Learners, 4YR College/ University Learners, Informal STEM Learners, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.					NPR
CNCS/ Ameri Corps		AmeriCorps State & National (Formula)	Engagement, Learning	D	D	D	I	D	D	Formula Grants	PK-12 School,2YR/Community College,4YR College/ University, Informal Educational/ Research Institution, Indian/Native American Tribal	PK-12 Learners, Pk-12 Teachers, 2YR College Learners, 4YR College/ University Learners, Informal STEM Learners, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.					NPR

										Government, Non-profit Organization						
CNCS/ Ameri Corps		AmeriCorps VISTA	Learning, Institutional Capacity, ED R&D	D	D	D	I	D	D	Discretionary Grants	PK-12 School, 2YR/ Community College, 4YR College/ University, Non-profit Organization	PK-12 Learners, Pk-12 Teachers, 2YR College Learners, 4YR College/ University Learners, 4YR College/ University Mentors, Informal STEM Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.			NPR
DHS		Educational Programs - Minority Serving Institutions	STEM Careers, Institutional Capacity, ED R&D	D	D	D	D	D	D	Formula Grants, Cooperative Agreements, Scholarships/ Fellowships	4YR College/University, U.S. Federal Government	Education Researchers, 2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/ University Learners, 4YR College/ University Instructors, 4YR College/ University Mentors, Leaders or Administrators IHE Leaders	160	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.		NPR
DOC	EDA	STEM Talent Challenge	Learning, Postsecondary Degrees, STEM Careers	D	D	D	D	I	D	Discretionary Grants	2YR/Community College,4YR College/ University, Non-profit Organization	2YR College Learners, 4YR College/ University Learners, Informal STEM Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.			NPR
DOC	NIST	NIST Summer Institute for Middle School Science Teachers	Educator/ Leader Performance	D	I	D	I	I	D	Other	PK-12 School	Pk-12 Teachers	24	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.		NPR
DOC	NIST	STEM Pipeline for the Next Generation Scientists and Engineers	Learning, Postsecondary Degrees,	D	D	D	D	D	D	Cooperative Agreements	4YR College/University, Non-profit Organization	4YR College/University Learners, Informal STEM Developers	10	C/NR	60% W, 30% NA/AN, 10% MR/E	70%	NC	NPR

		Program	Focus Areas							Mechanism	Institution Types	Participant Types	Number					
		with emphasis on the Graduate Student Measurement Science and Engineering (GMSE) Fellowship program	STEM Careers															
DOC	NIST	Summer Undergraduate Research Fellowship Program	Learning, STEM Careers, Institutional Capacity	D	I	D	I	D	D	Scholarships/ Fellowships	2YR/Community College, 4YR College/ University	2YR College Learners, 4YR College/ University Learners	163	C/NR	54% W, 25% A, 6% AA, 5% NA/AN, 10% H/L, 10% MR/E 35%	35%	NC	NPR
DOC	NOAA	Bay Watershed Education and Training (B-WET)	Engagement, Learning, Educator/ Leader Performance	D	I	I	D	D	U	Discretionary Grants	PK-12 School, 4YR College/ University, Indian/ Native American Tribal Government, Non-profit Organization, Other	PK-12 Learners, Pk-12 Teachers, Principals, Leaders, Administrators of PreK - 12 Schools, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	81,947	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NOAA (Monitoring and evaluation framework)				NPR
DOC	NOAA	Environmental Literacy Program (ELP)	Engagement, Learning, Institutional Capacity	D	I	I	D	D	I	Cooperative Agreements	PK-12 School, 2YR/ Community College, 4YR College/ University, Indian/Native American Tribal	PK-12 Learners, Pk-12 Teachers, Informal STEM Learners, Informal STEM Educators	17,264	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.				NPR

											Government, Non-profit Organization				For more information about this investment and/or from this agency, follow the provided link(s): NOAA (Monitoring and evaluation framework)	
DOC	NOAA	Ernest F. Hollings Scholarship Program	Learning, Postsecondary Degrees, STEM Careers	I	I	D	I	U	U	Scholarships/ Fellowships	Other-Scholarships only to individuals	4YR College/University Learners	244	226	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NOAA (Monitoring and evaluation framework)	NPR
DOC	NOAA	José E. Serrano Educational Partnership Program with Minority Serving Institutions	Postsecondary Degrees, STEM Careers, Institutional Capacity	I	D	D	D	I	I	Cooperative Agreements, Scholarships/ Fellowships	4YR College/University	4YR College/University Learners	306	255 For more info: NOAA (Monitoring and evaluation framework)	21% W, 4% A, 35% AA, 1% NA/AN, 34% H/L, 1% NH/PI, 4% MR/E	60%	NC	NPR
DOC	NOAA	Margaret A. Davidson Graduate Fellowship	Learning, STEM Careers	I	I	D	D	D	U	Cooperative Agreements, Scholarships/ Fellowships	4YR College/University	4YR College/University Learners, 4YR College/University Instructors, 4YR College/ University	29	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential	NPR

Agency	Sub	Program	Categories							Mechanism	Institution Types	Learner Types	Count	Count 2	Demographics	%	PRA	Report
												Mentors, Leaders or Administrators IHE Leaders, Informal STEM Developers						barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NOAA (Monitoring and evaluation framework)	
DOC	NOAA	National Sea Grant College Program	Engagement, Learning, STEM Careers	D	D	D	I	D	I	Cooperative Agreements	PK-12 School, 2YR/ Community College, 4YR College/ University, Informal Educational/ Research Institution, Indian/ Native American Tribal Government, Non-profit Organization	PK-12 Learners, Pk-12 Teachers, Education Researchers, 4YR College/University Learners, Informal STEM Learners, Informal STEM Educators	914,926					Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NOAA (Monitoring and evaluation framework)	NPR
DOC	NOAA	Ocean Exploration Education and Internships	Learning, Educator/ Leader Performance, STEM Careers	D	D	D	D	D	D	Discretionary Grants, Contractor Services, Cooperative Agreements, Prize Competitions	PK-12 School, 4YR College/University, Informal Educational/Research Institution	PK-12 Learners, Pk-12 Teachers, 2YR College Learners, 4YR College/ University Learners, 4YR College/ University Instructors, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	1,581					Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NOAA (Monitoring and evaluation framework)	Link
DOD	DAF-AFRL	Air and Space Force LEGACY	Learning, Postsecondary Degrees, STEM Careers	D	D	D	D	D	D	Contractor Services	2YR/Community College, 4YR College/University, U.S. Federal Government	PK-12 Learners, Pk-12 Teachers, 2YR College Learners, 4YR College/University Learners, Informal STEM Learners	435	388	66% W, 7% A, 8% AA, 1% NA/AN, 6% H/L, 1%	45%	PRA by SOM, Other	NPR

													NH/PI, 7% MR/E, 4% Other				
DOD	DASA (R&T)	Army Educational Outreach Program (AEOP)	Engagement, Learning	D	D	I	D	U	I	Discretionary Grants, Formula Grants, Contractor Services, Cooperative Agreements, Prize Competitions, Recognition/ Honorific Awards (direct to individuals), Scholarships/ Fellowships	2YR/Community College, 4YR College/ University	PK-12 Learners, Pk-12 Teachers, 2YR College Learners, 4YR College/ University Learners, Leaders or Administrators IHE Leaders, Informal STEM Learners, Informal STEM Educators	15,186	12,306	35% W, 19% A, 17% AA, 1% NA/AN, 12% H/L, 1% NH/PI, 8% MR/E, 7% Other	51%	PRA by Zip, PRA by Loc, PUA	Link
DOD	DAF	Dept of Air Force K-12 STEM Program	Engagement, Learning, Educator/ Leader Performance	D	D	D	D	D	D	Contractor Services, Cooperative Agreements, Prize Competitions, Other	PK-12 School, Non-profit Organization	PK-12 Learners, Pk-12 Teachers, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	1,114,014	R/E: 4,149 G: 42,595	29% W, 5% A, 6% AA, 5% NA/AN, 53% H/L, 1% NH/PI, 1% MR/E	39%	Other	NPR
DOD	USD P&R, M&RA	DOD STARBASE Program	Engagement, Learning, Educator/ Leader	D	D	D	D	D	D	Formula Grants, Contractor Services, Cooperative Agreements,	PK-12 School, 2YR/ Community College, 4YR College/ University, Indian/ Native American Tribal Government,	PK-12 Learners, Pk-12 Teachers, Principals, Leaders, Administrators of PreK - 12 Schools, Informal STEM Learners	76,534	68,423	56% W, 2% A, 16% AA, 2% NA/AN, 19%	47%	PRA by Zip, PUA	Link

			Performance							Federal Pay and Benefits	U.S. Federal Government, Non-profit Organization, For-profit Organization				H/L, 1% NH/PI, 4% MR/E			
DOD	MDA	Inspiring Generations with New Ideas to Transform Education (IGNITE)	Engagement, Learning, Educator/Leader Performance	D	D	D	D	D	D	Contractor Services, Other	PK-12 School	PK-12 Learners, Pk-12 Teachers, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	702		Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.			NPR
DOD	DTRA	Joint Science and Technology Institute (JSTI)	Engagement, Learning, STEM Careers	D	D	D	I	D	I	Other	Other	PK-12 Learners	133	133	40% W, 17% A, 21% AA, 3% NA/AN, 18% H/L[i], 5% MR/E, 14% Other	53%	PRA by Zip, PUA	NPR
DOD	OUSD (R&E)	National Defense Education Program (NDEP) - Science, Mathematics, and Research for Transformation Scholarship-for-Service Program	Engagement, Postsecondary Degrees, STEM Careers	D	D	D	I	I	I	Discretionary Grants, Contractor Services, Cooperative Agreements, Scholarships/ Fellowships	4YR College/ University, U.S. Federal Government	4YR College/University Learners	1,795	R/E: 1,759 G: 1,714	73% W, 8% A, 6% AA, 1% NA/AN, 8% H/L[i], 1% NH/PI, 3% MR/E	33%	PRA by Zip, PRA by Loc	NPR

DOD	OUSD (R&E)	National Defense Education Program (NDEP) STEM Education and Outreach	Engagement, Learning, STEM Careers	D	D	D	D	D	I	Discretionary Grants, Cooperative Agreements, Other	PK-12 School, 2YR/ Community College, 4YR College/ University, Informal Educational/ Research Institution, Non-profit Organization, For-profit Organization, Other	PK-12 Learners, Pk-12 Teachers, Principals, Leaders, Administrators of PreK - 12 Schools, 2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/ University Learners, 4YR College/ University Instructors, 4YR College/ University Mentors, Leaders or Administrators IHE Leaders, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	104,751	82,458	33% W, 13% A, 9% AA, 1% NA/AN, 15% H/L, 1% NH/PI, 28% Other	48%	PRA by Zip	NPR
DOD	OUSD (R&E)	National Defense Science and Engineering Graduate Fellowship Program (NDSEG)	Learning, Postsecondary Degrees, STEM Careers	D	D	D	D	D	I	Contractor Services	4YR College/University	4YR College/University Learners	487	487	67% W, 19% A, 1% AA, 1% NA/AN, 6% H/L, 4% MR/E, 2% Other	34%	NC	NPR
DOD	DON	Naval Research Enterprise Internship Program (NREIP)	Engagement, Learning, STEM Careers	D	I	D	U	I	I	Other	2YR/Community College, 4YR College/ University	2YR College Learners, 4YR College/ University Learners	540	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.				NPR
DOD	DON	Science and Engineering Apprenticeshi	Engagement, Learning,	D	I	D	U	I	I	Other	PK-12 School	PK-12 Learners	176	Data collection and/or reporting of participant information varies across investments. Appendix 3				NPR

		p Program (SEAP)	Postsecondary Degrees							Other			contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.				
DOE	EERE	Advanced Vehicle Technology Competitions (AVTC)	Learning, Postsecondary Degrees, STEM Careers	D	I	D	D	D	I	Other	PK-12 School, 4YR College/University, Other	4YR College/ University Learners, 4YR College/ University Instructors, 4YR College/ University Mentors	530	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.		Link
DOE	EERE	Algae Technology Educational Consortium	Engagement, Postsecondary Degrees, STEM Careers	D	D	D	D	D	I	Other	PK-12 School, 2YR/ Community College, 4YR College/ University	PK-12 Learners, Pk-12 Teachers, 2YR College Learners, 4YR College/ University Learners, Informal STEM Learners, Informal STEM Educators	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.				NPR
DOE	EERE	Collegiate Wind Competition	Learning, Postsecondary Degrees, STEM Careers	D	I	D	D	D	I	Discretionary Grants	4YR College/University	4YR College/University Learners, 4YR College/ University Instructors	832	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.		NPR
DOE	SC-WDTS	Community College Internships (CCI) Program	Learning, Postsecondary Degrees, STEM Careers	I	D	D	I	D	I	Other	Other	2YR College Learners	126	R/E: 91 G: 123	C/NR	37%	Other	NPR
DOE	SC-ASCR; NNSA	Computational Science Graduate Fellowship (CSGF)	Postsecondary Degrees, STEM Careers	I	I	D	D	D	I	Discretionary Grants, Scholarships/ Fellowships, Other	Non-profit Organization, Other	4YR College/University Learners	30	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.			NPR

DOE	CESER	CyberForce Competition	Postsecondary Degrees, STEM Careers	I	I	D	I	I	I	Other	2YR/Community College, 4YR College/ University, U.S. Federal Government	2YR College Learners, 4YR College/ University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.					NPR
DOE	EERE	Frontier Observatory for Research in Geothermal Energy (FORGE)	Engagement, Learning	D	I	D	U	D	U	Discretionary Grants	PK-12 School, 4YR College/ University	PK-12 Learners, Pk-12 Teachers, Education Researchers, 4YR College/ University Learners, 4YR College/ University Instructors, Informal STEM Learners, Informal STEM Educators	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.					NPR
DOE	EERE	Industrial Assessment Centers	Postsecondary Degrees, STEM Careers, Institutional Capacity	I	D	D	I	D	I	Cooperative Agreements	2YR/Community College,4YR College/ University	2YR College Learners, 2YR College Instructors, 4YR College/ University Learners, 4YR College/University Instructors, Leaders or Administrators IHE Leaders	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.					NPR
DOE	EERE	Jump Into STEM	Engagement, Postsecondary Degrees, STEM Careers	I	D	D	D	D	D	Other	2YR/Community College, 4YR College/ University	2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/ University Learners, 4YR College/ University Instructors, 4YR College/University Mentors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.					NPR
DOE	FECM	Micky Leland Fellowship Energy Fellowship Program	Postsecondary Degrees, STEM Careers	I	D	D	I	I	U	Scholarships/ Fellowships	4YR College/University	4YR College/University Learners	54	54	57% W, 9% A, 17% AA, 2% NA/AN, 30% H/L[i], 2% MR/E,	45%	NC	NPR

											13% Other						
DOE	ED	Minority Educational Institution Student Partnership Program	Learning, STEM Careers	I	D	D	I	I	U	Contractor Services, Other	PK-12 School, 4YR College/ University	PK-12 Learners, 2YR College Learners, 4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.				NPR
DOE	EM	Minority Serving Institution Partnership Program (MSIPP)	STEM Careers	D	D	D	D	I	I	Other	4YR College/University	4YR College/ University Learners, 4YR College/ University Instructors	49	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.				NPR
DOE	NNSA	Minority Serving Institution Partnership Program (MSIPP) & including the Tribal Education Partnership Program (TEPP)	Learning, STEM Careers, Institutional Capacity	I	D	D	D	D	I	Other	PK-12 School, 2YR/ Community College, 4YR College/ University, Indian/ Native American Tribal Government, U.S. Federal Government, Non-profit Organization, Other	Pk-12 Teachers, Education Researchers, 2YR College Learners, 2YR College Instructors, 4YR College/ University Learners, 4YR College/ University Instructors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.				NPR
DOE	SC-WDTS	National Science Bowl	Engagement, Learning, Postsecondary Degrees	D	I	I	I	D	I	Contractor Services, Prize Competitions	PK-12 School	PK-12 Learners, Informal STEM Learners	8,469	R/E: 6,077 G: 8,237	41% W, 43% A, 3% AA, 1% NA/AN, 8% H/L, 1% NH/PI, 3% MR/E	34%	PRA by Loc, PUA	NPR

DOE	SC-BES, SC-DOE IP	Nuclear Chemistry Summer School (NCSS)	Postsecondary Degrees, STEM Careers	I	I	D	I	D	U	Discretionary Grants, Other	2YR/Community College, 4YR College/ University, Other	4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.					NPR
DOE	SC-WDTS	Office of Science Graduate Student Research (SCGSR) Program	Postsecondary Degrees, STEM Careers	I	I	D	I	D	I	Other	Other (stipends)	4YR College/University Learners	130	R/E: 117 G: 126	C/NR	29%	Other	NPR
DOE	NNSA	Pit Production Workforce Development Partnership	Engagement, STEM Careers, Institutional Capacity	I	D	D	D	I	I	Discretionary Grants	2YR/Community College,4YR College/ University	2YR College Learners, 2YR College Instructors, 4YR College/ University Learners, 4YR College/ University Instructors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.					NPR
DOE	NNSA	Rickover Fellowship Program in Nuclear Engineering	STEM Careers	U	I	D	U	D	D	Cooperative Agreements	Non-profit Organization	4YR College/University Learners, 4YR College/ University Instructors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.					NPR
DOE	NNSA	Savannah River Site Community Reuse Organization Workforce Opportunities in Regional Careers Program	Engagement, STEM Careers	I	I	D	I	I	U	Discretionary Grants	Non-profit Organization	2YR College Learners, 4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.					NPR
DOE	SC-WDTS	Science Undergraduate Laboratory Internships	Postsecondary Degrees,	I	I	D	I	D	I	Other	Other	2YR College Learners, 4YR College/University Learners	1,053	R/E: 1,000 G: 1,029	63% W, 15% A, 4% AA, 1%	41%	Other	NPR

			STEM Careers												NA/AN, 10% H/L, 1% NH/PI, 6% MR/E		
DOE	EERE	Solar Decathlon	Learning, Postsecondary Degrees, STEM Careers	D	D	D	D	D	I	Prize Competitions, Recognition/ Honorific Awards (direct to individuals), Other	4YR College/University	PK-12 Learners, PK-12 Teachers, 2YR College Learners, 2YR College Instructors, 4YR College/ University Learners, 4YR College/ University Instructors, Informal STEM Learners	2,269	R/E: 440 G: 448	55% W, 27% A, 4% AA, 1% NA/AN, 10% H/L, 1% NH/PI, 2% MR/E	50%	C/NR	NPR
DOE	EERE	Solar District Cup	STEM Careers, Institutional Capacity	D	D	D	D	D	I	Contractor Services, Prize Competitions, Federal Pay and Benefits, Other	2YR/Community College, 4YR College/ University, U.S. Federal Government, Non-profit Organization, For-profit Organization, Other	2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/ University Learners, 4YR College/ University Instructors, 4YR College/ University Mentors, Leaders or Administrators IHE Leaders	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.					Link
DOE	NNSA	Stewardship Science Academic Alliances (SSAA)	Postsecondary Degrees	I	I	D	D	D	I	Discretionary Grants, Cooperative Agreements	4YR College/University, Non-profit Organization	4YR College/University Learners, 4YR College/University Instructors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.					NPR
DOE	SC-HEP	U.S. Particle Accelerator Training Program	Postsecondary Degrees, STEM Careers	I	I	D	D	D	I	Cooperative Agreements, Scholarships/ Fellowships	4YR College/ University, U.S. Federal Government, Non-profit Organization, International Organization, Other	4YR College/University Learners, 4YR College/ University Instructors, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.					NPR

DOE	NE	University Nuclear Leadership Program (UNLP)	Engagement, Postsecondary Degrees	I	I	D	I	I	U	Scholarships/ Fellowships	2YR/Community College, 4YR College/ University	2YR College Learners, 2YR College Instructors, 4YR College/ University Learners, 4YR College/ University Instructors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.			NPR
DOE	SC-WDTS	Visiting Faculty Program (VFP)	STEM Careers, Institutional Capacity	I	D	D	I	D	I	Other	Other	4YR College/University Learners, 4YR College/ University Instructors	92	R/E: 76 G: 90	C/NR	22%	Oth er	NPR
DOE	EERE	Water Power STEM/ Workforce	Engagement, Learning, Postsecondary Degrees	D	I	D	I	I	U	Contractor Services, Prize Competitions, Other	PK-12 School, 2YR/Community College, 4YR College/ University, Non-profit Organization	PK-12 Learners, Pk-12 Teachers, 2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/ University Learners, 4YR College/ University Instructors, 4YR College/ University Mentors, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.			NPR
DOE	EERE	Wind for Schools	Engagement, Learning, STEM Careers	D	D	D	I	I	I	Discretionary Grants	PK-12 School, 4YR College/University	PK-12 Learners, Pk-12 Teachers, Education Researchers, 4YR College/ University Learners, 4YR College/University Instructors, Informal STEM Learners, Informal STEM Educators	750	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.			NPR
DOI	USGS	The USGS National Cooperative Geologic	Learning, Postsecondary Degrees,	D	D	D	D	I	U	Cooperative Agreements	4YR College/University	4YR College/University Learners, 4YR College/University Instructors	72	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential			NPR

Agency	Office	Program	Objective							Funding Mechanism	Organization Type	Learner/Participant Type	Number	Notes	NPR
		Mapping Program (NCGMP) EDMAP Program	STEM Careers											barriers or challenges that preclude an investment from collecting and/or reporting participant data.	
DOL	Employment and Training Administration	H-1B Skills Training Grants, specifically for year specified: H-1B Rural Healthcare Grant Program and H-1B One Workforce Grant Program	STEM Careers	I	D	D	D	U	I	Discretionary Grants	2YR/Community College, 4YR College/University, Indian/Native American Tribal Government, Non-profit Organization, For-profit Organization, Other	2YR College Learners, 4YR College/University Learners, Leaders or Administrators IHE Leaders		Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR
DOT	Federal Aviation Administration	Centers of Excellence Grant Program		U	I	I	D	I	I	Discretionary Grants, Cooperative Agreements	4YR College/University	4YR College/University Learners		Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR
DOT	Federal Highway Administration	Dwight D. Eisenhower Transportation Fellowship Program	Engagement, Postsecondary Degrees, STEM Careers	D	D	D	D	D	I	Discretionary Grants	2YR/Community College, 4YR College/University	2YR College Learners, 4YR College/University Learners	200	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR
DOT	Federal Railroad Admin	Encouraging Early (K-12) Interest in Railroad Careers	Engagement, Institutional	D	D	D	D	D	U	Other	Other	PK-12 Learners, Education Researchers, Informal STEM Learners, Informal STEM Educators,		Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR

	istration	through STEM Education	Capacity, ED R&D							Contractor Services		Informal STEM Developers					
DOT	Federal Railroad Administration	Making Railroading a Career of Choice through STEM Education	Engagement, Institutional Capacity, ED R&D	D	D	D	D	D	U	Contractor Services	4YR College/University	PK-12 Learners, Education Researchers, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.				NPR
DOT	Federal Highway Administration	National Summer Transportation Institute	Engagement, Learning, STEM Careers, Institutional Capacity, System Reform	D	D	D	D	D	D	Discretionary Grants	2YR/Community College, 4YR College/University, Indian/Native American Tribal Government	PK-12 Learners, 4YR College/University Learners	1,352	R/E: 676 G: 563	22% W, 9% A, 30% AA, 4% NA/AN, 25% H/L, 1% NH/PI, 9% MR/E	43%	C/NR	NPR
DOT	Federal Highway Administration	Summer Transportation Internship Program for Diverse Groups (STIPDG)	Engagement, Learning, STEM Careers	I	D	D	D	D	I	Contractor Services	2YR/Community College, 4YR College/University, Non-profit Organization, Other	2YR College Learners, 4YR College/University Learners	98	99	C/NR	52%	NC	NPR
DOT	Office of the Assistant Secretary for Research and Technology	University Transportation Centers Program	Engagement, Postsecondary Degrees, STEM Careers	D	D	D	D	D	I	Discretionary Grants	2YR/Community College, 4YR College/University	PK-12 Learners, Pk-12 Teachers, Education Researchers, 2YR College Learners, 2YR College Instructors, 4YR College/University Learners, 4YR College/University Instructors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.				Link

ED		Education Innovation and Research (EIR)	Engagement, Learning, ED R&D	D	D	I	I	D	D	Discretionary Grants	PK-12 School, 2YR/ Community College, 4YR College/ University, Informal Educational/ Research, Non-profit Organization	PK-12 Learners, Pk-12 Teachers, Education Researchers, Principals, Leaders, Administrators of PreK - 12 Schools, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.		NPR
ED		Minority Science and Engineering Improvement Program (MSEIP)	Postsecondary Degrees, STEM Careers, Institutional Capacity	D	D	D	D	D	D	Discretionary Grants	2YR/Community College, 4YR College/ University	PK-12 Learners, Pk-12 Teachers, Education Researchers, 2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/ University Learners, 4YR College/ University Instructors, 4YR College/ University Mentors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.		NPR
ED		Out of School Time Career Pathway (OSTCP)	Engagement, Learning, STEM Careers	D	D	D	I	I	D	Discretionary Grants	PK-12 School, Informal Educational/Research Institution	Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	144	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR
ED		Predominantly Black Institutions Competitive Grant Program	Engagement, Postsecondary Degrees, STEM Careers, Institutional Capacity	D	D	D	I	D	D	Discretionary Grants	2YR/Community College, 4YR College/ University	2YR College Learners, 2YR College Instructors, 4YR College/ University Instructors, Leaders or Administrators IHE Leaders	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.		NPR

ED		Regional Educational Laboratories (REL)	Institutional Capacity	I	I	I	I	I	I	Contractor Services	PK-12 School, 2YR/Community College, 4YR College/ University, Informal Educational/ Research Institution, Indian/ Native American Tribal Government, Non-profit Organization	PK-12 Learners, Pk-12 Teachers, Education Researchers, Principals, Leaders, Administrators of PreK - 12 Schools, 2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/University Learners, 4YR College/ University Instructors, 4YR College/ University Mentors, Leaders or Administrators IHE Leaders, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR
ED		Research in Special Education	ED R&D	I	I	I	I	I	I	Discretionary Grants, Contractor Services, Cooperative Agreements	PK-12 School, 4YR College/ University, Non-profit Organization, For-profit Organization	PK-12 Learners, Pk-12 Teachers, Education Researchers, Principals, Leaders, Administrators of PreK - 12 Schools, 2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/University Learners, 4YR College/ University Instructors, 4YR College/ University Mentors, Leaders or Administrators IHE Leaders, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR

ED		Research, Development, and Dissemination (RDD)	ED R&D	I	I	I	I	I	I	Discretionary Grants, Contractor Services, Cooperative Agreements	PK-12 School, 2YR/ Community College, 4YR College/University, Non-profit Organization, For-profit Organization	PK-12 Learners, Pk-12 Teachers, Education Researchers, Principals, Leaders, Administrators of PreK - 12 Schools, 2YR College Learners, 2YR College Instructors, 4YR College/ University Learners, 4YR College/ University Instructors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR
ED		Teacher Loan Forgiveness	Postsecondary Degrees	I						Other	PK-12 School	Pk-12 Teachers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR
ED		Title III HSI STEM and Articulation Program	Postsecondary Degrees, Institutional Capacity	D	D	D	D	D	D	Discretionary Grants	2YR/Community College, 4YR College/ University, Non-profit Organization	2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/University Learners, 4YR College/ University Instructors, 4YR College/ University Mentors, Leaders or Administrators IHE Leaders	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR
EPA		Environmental Education Grant Program	Learning, Educator/ Leader Performance, Institutional Capacity	I	I	I	D	D	I	Discretionary Grants, Other	PK-12 School, 2YR/ Community College, 4YR College/ University, Indian/ Native American Tribal Government, Other	PK-12 Learners, Pk-12 Teachers, Principals, Leaders, Administrators of PreK - 12 Schools, 2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/University Learners, 4YR College/ University Instructors, 4YR College/University Mentors, Leaders or Administrators IHE	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR

											Leaders, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers			
EPA		National Environmental Education and Training Program	Educator/ Leader Performance	I	I	I	I	I	U	Discretionary Grants, Contractor Services	4YR College/University, Informal Educational/ Research, Non-profit Organization	Pk-12 Teachers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR
EPA		U.S. EPA's People, Prosperity, and the Planet (P3) Program	Engagement, Postsecondary Degrees, STEM Careers	D	D	D	D	D	D	Discretionary Grants	4YR College/University	4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR
HHS	NIH	Aging Research Dissertation Awards to Increase Diversity (R36 Clinical Trial Not Allowed)	Postsecondary Degrees	D	D	D	U	I	U	Discretionary Grants	4YR College/University	4YR College/University Learners	22 Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Bridges to the Baccalaureate Research Training Program	Learning, Postsecondary Degrees, STEM Careers	U	D	D	U	U	U	Discretionary Grants	2YR/Community College, 4YR College/ University	2YR College Learners, 4YR College/ University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR

HHS	NIH	Bridges to the Doctorate Program	Learning, Postsecondary Degrees, STEM Careers	U	D	D	U	U	U	Discretionary Grants	4YR College/University	4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Cancer Research Education Grants Program (R25)	Learning, Postsecondary Degrees, STEM Careers	D	D	D	D	D	I	Discretionary Grants	4YR College/University	4YR College/University Learners, 4YR College/University Instructors, 4YR College/University Mentors, Informal STEM Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Enhancing Science, Technology, EnginEering, and Math Education Diversity (ESTEEMED) Research Education Experiences (R25)	Engagement, Learning, Postsecondary Degrees, STEM Careers, Institutional Capacity	D	D	D	D	D	I	Discretionary Grants	4YR College/University	4YR College/University Learners, 4YR College/University Instructors, 4YR College/University Mentors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Fogarty Global Health Training Program	STEM Careers, Institutional Capacity	I	D	D	D	D	U	Discretionary Grants	4YR College/University, Other	4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR

HHS	NIH	Graduate Partnerships Program	Postsecondary Degrees, STEM Careers, Institutional Capacity	I	U	D	I	I	U	Scholarships/ Fellowships	4YR College/University, Non-profit Organization, International Organization	4YR College/University Learners, 4YR College/University Instructors, 4YR College/University Mentors, Leaders or Administrators IHE Leaders, Informal STEM Developers	450	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Graduate Research Training Initiative for Student Enhancement (G-RISE)	Learning, Postsecondary Degrees, STEM Careers	U	D	D	U	U	U	Discretionary Grants	4YR College/University	4YR College/University Learners, 4YR College/University Mentors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)		NPR
HHS	NIH	Initiative for Maximizing Research Education in Genomics; Diversity Action Plan	Learning, Postsecondary Degrees, STEM Careers	I	D	D	I	D	I	Discretionary Grants	4YR College/University	4YR College/University Learners	170	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Initiative for Maximizing Student Development	Learning, Postsecondary Degrees, STEM Careers	U	D	D	U	U	U	Discretionary Grants	4YR College/University	4YR College/University Learners, 4YR College/University Mentors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from		NPR

												this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)		
HHS	NIH	Maximizing Access to Research Careers (MARC)	Learning, Postsecondary Degrees, STEM Careers	U	D	D	U	U	U	Discretionary Grants	4YR College/University	4YR College/University Learners, 4YR College/University Instructors, 4YR College/University Mentors, Leaders or Administrators IHE Leaders	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	MSTEM: Advancing Diversity in Aging Research through Undergraduate Education (R25 - Independent Clinical Trial Not Allowed)	Engagement, Postsecondary Degrees, STEM Careers	D	D	D	I	I	U	Discretionary Grants	4YR College/University	4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	National Library of Medicine Institutional Training Grants for Research Training in Biomedical Informatics and Data Science	Learning, Postsecondary Degrees, STEM Careers	U	D	D	U	U	D	Discretionary Grants	4YR College/University, Non-profit Organization	4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	NCI Predoctoral to Postdoctoral	STEM Careers	I	I	I	I	I	U	Discretionary Grants	Other	4YR College/University Learners	44	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential	NPR

		Fellow Transition Award											barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	
HHS	NIH	NIDA Research Education Program for Clinical Researchers and Clinicians	ED R&D	D	I	D	U	D	I	Discretionary Grants	Non-profit Organization	Leaders or Administrators IHE Leaders	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	NIDDK Education Program Grants (R25 Clinical Trial Not Allowed) PAR-21-034	Engagement, Postsecondary Degrees, STEM Careers	D	I	D	I	D	I	Discretionary Grants	Other	4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	NIH Blueprint and BRAIN Initiative Diversity Specialized Predoctoral to Postdoctoral Advancement in Neuroscience (D-SPAN) Award	Postsecondary Degrees	D	D	D	U	I	U	Discretionary Grants	4YR College/University	4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR

HHS	NIH	NIH Blueprint Enhancing Neuroscience Diversity through Undergraduate Research Education Experiences (ENDURE)	Learning, Postsecondary Degrees, STEM Careers	D	D	D	U	I	I	Discretionary Grants	2YR/Community College, 4YR College/University	2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/University Learners, 4YR College/ University Instructors, 4YR College/University Mentors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	NIH Building Infrastructure Leading to Diversity (BUILD) Initiative (RL5 portion only)	Postsecondary Degrees, STEM Careers, Institutional Capacity	U	D	D	U	U	U	Cooperative Agreements	2YR/Community College, 4YR College/University	2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/University Learners, 4YR College/ University Instructors, 4YR College/University Mentors, Leaders or Administrators IHE Leaders	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	NIH Building Infrastructure Leading to Diversity (BUILD) Initiative (TL4 portion only)	Postsecondary Degrees, STEM Careers, Institutional Capacity	U	D	D	U	U	U	Cooperative Agreements	2YR/Community College, 4YR College/ University	2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/University Learners, 4YR College/ University Instructors, 4YR College/ University Mentors, Leaders or Administrators IHE Leaders	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	NIH Neuroscience Development for Advancing the Careers of a Diverse Research Workforce	Learning, Postsecondary Degrees, STEM Careers	D	D	D	U	I	I	Discretionary Grants	4YR College/University, Non-profit Organization	4YR College/University Learners, 4YR College/ University Instructors, 4YR College/University Mentors, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR

HHS	NIH	NIMHD Minority Health and Health Disparities International Research Training (T37)	Engagement, Learning, STEM Careers	I	D	D	I	I	I	Discretionary Grants	NC	NC	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Postbaccalaureate Intramural Research Training Award Program	Postsecondary Degrees	I	I	D	U	U	U	Scholarships/ Fellowships	4YR College/University	4YR College/University Learners	1,643	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Postbaccalaureate Research Education Program (PREP)	Learning, Postsecondary Degrees, STEM Careers	D	D	D	U	U	U	Discretionary Grants	4YR College/University	4YR College/University Learners, 4YR College/ University Instructors, 4YR College/ University Mentors, Leaders or Administrators IHE Leaders	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Providing Research Education Experiences to Enhance Diversity in the Next Generation of Substance Use and	Postsecondary Degrees, STEM Careers, ED R&D	D	D	D	U	I	I	Discretionary Grants	4YR College/University	4YR College/University Learners, 4YR College/ University Instructors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR

		Addiction Scientists (R25 Clinical Trials Not Allowed)											
HHS	NIH	Research Initiative for Scientific Enhancement (RISE)	Learning, Postsecondary Degrees, STEM Careers	U	D	D	U	U	U	Discretionary Grants	4YR College/University	4YR College/University Learners,4YR College/ University Instructors,4YR College/ University Mentors, Leaders or Administrators IHE Leaders	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Research Supplements to Promote Diversity in Health-Related Research	Engagement	U	D	D	U	U	U	Other	PK-12 School, 4YR College/ University	PK-12 Learners,4YR College/ University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Ruth L. Kirschstein National Research Service Award Institutional Research Training Grants (T32, T35)	Postsecondary Degrees, STEM Careers	U	I	D	U	I	U	Discretionary Grants	4YR College/University	4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Ruth L. Kirschstein NRSA for Individual Predoctoral Fellows, including	Postsecondary Degrees, STEM Careers	U	D	D	U	U	U	Discretionary Grants	4YR College/University	4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from	NPR

		Underrepresented Racial/Ethnic Groups, Students from Disadvantaged Backgrounds, and Predoctoral Students with Disabilities										this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	
HHS	NIH	Science Education Partnership Award	Engagement, Learning, Educator/Leader Performance, STEM Careers, Institutional Capacity, System Reform, ED R&D	D	D	D	D	D	D	Other	PK-12 School, 4YR College/University, Informal Educational/ Research Institution, U.S. Federal Government, Non-profit Organization, For-profit Organization	PK-12 Learners, Pk-12 Teachers, Education Researchers, Principals, Leaders, Administrators of PreK - 12 Schools, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Short-Term Research Education Program to Enhance Diversity in Health-Related Research	Learning, STEM Careers	I	D	D	D	I	I	Discretionary Grants	4YR College/University	4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Short-Term Research Experience Program to	Learning, Postsecondary Degrees,	I	D	D	I	I	U	Discretionary Grants	4YR College/University	PK-12 Learners, Pk-12 Teachers, 2YR College Learners, 4YR College/ University Learners,	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from	NPR

Dept	Agency	Investment	Category							Funding Mechanism	Recipient	Participants	Notes		NPR
		Unlock Potential	STEM Careers									4YR College/University Mentors	collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)		
HHS	NIH	Strengthening Institutional Capacity to Conduct Global Cancer Research in Low-and Middle-Income Countries	STEM Careers, Institutional Capacity	I	D	D	D	D	D	Discretionary Grants	4YR College/University, International Organization	Education Researchers, 4YR College/University Learners, 4YR College/University Instructors, 4YR College/University Mentors, Leaders or Administrators IHE Leaders	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)		NPR
HHS	NIH	Student Intramural Research Training Award Program	Engagement, Postsecondary Degrees	I	I	D	U	U	U	Scholarships/ Fellowships	PK-12 School or Local Educational Authority, 2YR College/ Community College, 4YR College/ University	PK-12 Learners, 2YR College Learners, 4YR College/ University Learners	825	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Substance Use/Substance Use Disorder Dissertation Research Award (R36 - Clinical Trials Optional)	Postsecondary Degrees, STEM Careers	D	I	D	U	I	D	Discretionary Grants	4YR College/University, Non-profit Organization	4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)		NPR
HHS	NIH	Summer Institute for Research	STEM Careers	I	I	D	I	D	D	Discretionary Grants	4YR College/University	4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or		NPR

		Education in Biostatistics and Data Science											challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	
HHS	NIH	Summer Research Education Experience Program	Educator/ Leader Performance, Postsecondary Degrees, STEM Careers	D	I	D	U	I	I	Discretionary Grants	4YR College/University	PK-12 Learners, Pk-12 Teachers, Education Researchers, 4YR College/ University Learners, 4YR College/ University Mentors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Team-Based Design in Biomedical Engineering Education (R25)	Engagement, Learning, Postsecondary Degrees, STEM Careers, Institutional Capacity	D	I	D	D	D	I	Discretionary Grants	4YR College/University	4YR College/University Learners, 4YR College/ University Instructors, 4YR College/University Mentors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	UMD-NCI Partnership for Integrative Cancer Research	Learning, STEM Careers	I	I	D	D	D	I	Discretionary Grants, Cooperative Agreements, Scholarships/ Fellowships	4YR College/University, U.S. Federal Government	4YR College/University Learners, 4YR College/University Instructors, 4YR College/University Mentors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Undergraduate Research Education Program (UP) to Enhance	Engagement, Learning, STEM Careers	I	D	D	I	I	I	Discretionary Grants	4YR College/University, Non-profit Organization	4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For	NPR

		Diversity in the Environmental Health Sciences										more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)		
HHS	NIH	Undergraduate Research Training Initiative for Student Enhancement (U-RISE)	Learning, Postsecondary Degrees, STEM Careers	U	D	D	U	U	U	Discretionary Grants	4YR College/University	4YR College/University Learners, 4YR College/ University Instructors, 4YR College/ University Mentors, Leaders or Administrators IHE Leaders	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Undergraduate Scholarship Program	Postsecondary Degrees	I	I	D	U	U	U	Scholarships/ Fellowships, Federal Pay and Benefits	4YR College/University	4YR College/University Learners	32	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR
HHS	NIH	Undergraduate Summer Research Education in Kidney, Urologic, and Hematologic Diseases; solicited via two funding announcements: RFA-DK-13-005 and	Engagement, Postsecondary Degrees, STEM Careers	D	I	D	I	D	I	Discretionary Grants	Other	4YR College/University Learners	120	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NIH Data Book (NIH-Funded Research Workforce, 9 tabs)	NPR

		RFA-DK-18-006												
NASA		[Minority University Research and Education Project (MUREP)]	Postsecondary Degrees, STEM Careers, Institutional Capacity	I	D	D	I	I	U	Cooperative Agreements, Prize Competitions, Scholarships/ Fellowships	2YR/Community College,4YR College/University, Non-profit Organization	PK-12 Learners, Pk-12 Teachers, Principals, Leaders, Administrators of PreK - 12 Schools, 2YR College Learners, 4YR College/University Learners, 4YR College/University Instructors, Informal STEM Educators	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NASA	NPR
NASA		[National Space Grant College and Fellowship Project (Space Grant)]	Postsecondary Degrees	D	I	D	D	D	I	Cooperative Agreements	PK-12 School, 2YR/ Community College, 4YR College/ University, Informal Educational/ Research Institution, Indian/Native American Tribal Government, U.S. Federal Government, Non-profit Organization	PK-12 Learners, Pk-12 Teachers, Principals, Leaders, Administrators of PreK - 12 Schools, 2YR College Learners, 2YR College Instructors, 4YR College/University Learners, 4YR College/University Instructors, Leaders or Administrators IHE Leaders, Informal STEM Learners, Informal STEM Educators	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NASA	NPR
NASA		[Next Gen STEM]	Engagement, Learning	D	I	I	D	D	I	Contractor Services, Cooperative Agreements, Prize Competitions	PK-12 School, Informal Educational/Research Institution	PK-12 Learners, Pk-12 Teachers, Principals, Leaders, Administrators of PreK - 12 Schools, 2YR College Learners, 4YR College/University Learners, 4YR College/ University Instructors, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NASA	NPR

Agency		Investment	Categories							Funding Mechanism	Institution Types	Participant Types	Notes	
NASA		Robotics Alliance Project (RAP)	Engagement, Learning, STEM Careers	D	I	D	D	D	D	Discretionary Grants, Contractor Services, Cooperative Agreements, Federal Pay and Benefits	PK-12 School, 2YR/Community College, 4YR College/University, Informal Educational/Research Institution, U.S. Federal Government, Non-profit Organization, For-profit Organization, International Organization	PK-12 Learners, Pk-12 Teachers, Principals, Leaders, Administrators of PreK - 12 Schools, 2YR College Learners, 2YR College Mentors, 4YR College/University Learners, 4YR College/University Mentors, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NASA	NPR
NASA		Science Activation Program	Engagement, Learning, Institutional Capacity	D	D	I	D	D	I	Cooperative Agreements	2YR/Community College, 4YR College/University, Informal Educational/Research Institution, U.S. Federal Government, Non-profit Organization, For-profit Organization, Other	PK-12 Learners, Pk-12 Teachers, 2YR College Learners, 2YR College Instructors, 4YR College/University Learners, Informal STEM Learners, Informal STEM Educators	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NASA	NPR
NASA		The Global Learning and Observations to Benefit the Environment (GLOBE) Program	Engagement, Learning, Educator/Leader Performance	D	D	D	D	D	D	Contractor Services, Cooperative Agreements, Other	PK-12 School, 2YR/Community College, 4YR College/University, Informal Educational/Research Institution, U.S. Federal Government, Non-profit Organization, For-profit Organization, International Organization	PK-12 Learners, Pk-12 Teachers, 2YR College Learners, 2YR College Instructors, 4YR College/University Learners, 4YR College/University Instructors, Leaders or Administrators IHE Leaders, Informal STEM Learners, Informal STEM Educators	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): NASA	NPR

NSF		Advanced Technical Education	Postsecondary Degrees, STEM Careers	D	D	D	D	D	D	Discretionary Grants, Prize Competitions	PK-12 School, 2YR/Community College, 4YR College/University, Non-profit Organization	PK-12 Learners, Pk-12 Teachers, 2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/University Learners, 4YR College/University Instructors, Leaders or Administrators IHE Leaders	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	Link
NSF		Advancing Informal STEM Learning (AISL)	Engagement, Learning, ED R&D	I	I	I	I	I	I	Discretionary Grants, Cooperative Agreements	4YR College/University, Informal Educational/ Research Institution, Indian/Native American Tribal Government, U.S. Federal Government, Non-profit Organization, For-profit Organization, Other	PK-12 Learners, Education Researchers, 2YR College Learners, 4YR College/University Learners, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	NPR
NSF		CS for All: Research and RPPs	Engagement, Learning, ED R&D	D	D	D	I	D	D	Formula Grants	PK-12 School, 4YR College/University, Non-profit Organization	PK-12 Learners, Pk-12 Teachers, Education Researchers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	NPR
NSF		Cybercorps: Scholarship for Service (SFS)	Engagement, Learning, Postsecondary Degrees, STEM Careers,	I	D	D	D	D	D	Discretionary Grants, Contractor Services, Other	PK-12 School, 2YR/Community College, 4YR College/University, Indian/Native American Tribal Government, U.S. Federal Government, Non-	PK-12 Learners, Pk-12 Teachers, 2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/University Learners, 4YR College/University	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	NPR

			Institutional Capacity							profit Organization, Other	Instructors, 4YR College/University Mentors, Leaders or Administrators IHE Leaders	
NSF		[Discovery Research PreK-12]	Learning, Educator/ Leader Performance, ED R&D	D	I	D	I	D	D	Discretionary Grants, Federal Pay and Benefits	PK-12 School, 2YR/Community College, 4YR College/ University, Informal Educational/ Research Institution, U.S. Federal Government, Non-profit Organization, For-profit Organization	PK-12 Learners, Pk-12 Teachers, Education Researchers, Principals, Leaders, Administrators of PreK - 12 Schools, 4YR College/University Learners, 4YR College/University Instructors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	NPR
NSF		[EDU Core Research (ECR) Program]	ED R&D	I	I	I	I	I	I	Discretionary Grants, Cooperative Agreements	2YR/Community College, 4YR College/ University, Informal Educational/ Research Institution, Non-profit Organization	PK-12 Learners, Pk-12 Teachers, Education Researchers, Principals, Leaders, Administrators of PreK - 12 Schools, 2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/University Learners, 4YR College/ University Instructors, 4YR College/University Mentors, Leaders or Administrators IHE Leaders, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	NPR
NSF		Emerging Frontiers in Research and Innovation	Engagement, Learning, Postsecon	D	D	D	D	D	I	Other	PK-12 School, 2YR/Community College, 4YR College/University	Pk-12 Teachers, 2YR College Learners, 2YR College Instructors, 4YR College/University	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from	NPR

Agency		Investment	Categories							Mechanisms	Settings	Participants	Count	Notes	PRA	NPR
		(EFRI) Research Experience and Mentoring (REM)	dary Degrees									Learners, 4YR College/University Mentors		collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3		
NSF		Excellence Awards in Science and Engineering (EASE)	Learning, Postsecondary Degrees, STEM Careers	D	D	D	D	I	U	Contractor Services, Prize Competitions, Recognition/ Honorific Awards (direct to individuals)	PK-12 School, 4YR College/University, Informal Educational/ Research Institution, U.S. Federal Government, Non-profit Organization	Pk-12 Teachers, 4YR College/University Mentors, Informal STEM Developers	230	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	PRA by Loc, PUA	NPR
NSF		Graduate Research Fellowship Program (GRFP)	Engagement, Learning, Postsecondary Degrees, STEM Careers	U	D	D	U	D	D	Contractor Services, Scholarships/ Fellowships	4YR College/University	4YR College/University Learners		Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): GRFP Ref #1, NSF Ref#1, NSF Ref#2, NSF Ref#3		NPR
NSF		Historically Black Colleges and Universities Undergraduate Program	Institutional Capacity, ED R&D	I	D	I	I	I	I	Discretionary Grants, Formula Grants	4YR College/University	Education Researchers, 2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/University Learners, 4YR College/University Instructors, 4YR College/University Mentors, Leaders or Administrators IHE		Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3		NPR

											Leaders, Informal STEM Developers			
NSF		Improving Undergraduate STEM Education: Education and Human Resources (IUSE: EDU)	Postsecondary Degrees, Institutional Capacity, ED R&D	D	D	D	I	D	I		Discretionary Grants, Other	2YR/Community College, 4YR College/University, Non-profit Organization	Pk-12 Teachers, Education Researchers, Principals, Leaders, Administrators of PreK - 12 Schools, 2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/University Learners, 4YR College/University Instructors, 4YR College/University Mentors, Leaders or Administrators IHE Leaders	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	NPR
NSF		Improving Undergraduate STEM Education: Hispanic Serving Institutions	Engagement, Postsecondary Degrees, Institutional Capacity	D	D	D	D	I	I		Discretionary Grants	2YR/Community College, 4YR College/University	Education Researchers, 2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/University Learners, 4YR College/University Instructors, 4YR College/University Mentors, Leaders or Administrators IHE Leaders, Informal STEM Learners, Informal STEM Educators	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	NPR
NSF		Inclusion across the Nation of Communities of Learners of Underrepresented	Institutional Capacity, System Reform, ED R&D	I	D	D	D	U	I		Discretionary Grants, Contractor Services, Cooperative Agreements	PK-12 School, 2YR/Community College, 4YR College/University, Informal Educational/ Research Institution, Indian/Native	PK-12 Learners, Pk-12 Teachers, Education Researchers, Principals, Leaders, Administrators of PreK - 12 Schools, 2YR College Learners, 2YR College Instructors,	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this	NPR

Agency		Investment	Goals							Mechanism	Settings	Participants	Participant Data Notes	
		Discoverers in Engineering and Science (NSF INCLUDES) [ii]									American Tribal Government, U.S. Federal Government, Non-profit Organization	2YR College Mentors, 4YR College/University Learners, 4YR College/University Instructors, 4YR College/University Mentors, Leaders or Administrators IHE Leaders, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	
NSF		Innovative Technology Experiences for Students and Teachers (ITEST)	Engagement, STEM Careers, ED R&D	D	D	D	D	I	I	Discretionary Grants	PK-12 School, 2YR/Community College, 4YR College/University, Informal Educational/Research Non-profit Organization	PK-12 Learners, Pk-12 Teachers, Education Researchers, Principals, Leaders, Administrators of PreK - 12 Schools, 2YR College Learners, 2YR College Instructors, 4YR College/University Learners, 4YR College/University Instructors, 4YR College/University Mentors, Leaders or Administrators IHE Leaders, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	NPR
NSF		International Research Experience for Students	Engagement, Learning, STEM Careers	D	D	D	I	I	I	Other	4YR College/University	4YR College/University Learners, 4YR College/University Instructors, 4YR College/University Mentors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	NPR

NSF		Louis Stokes Alliances for Minority Participation	Engagement, Learning, Postsecondary Degrees, STEM Careers, ED R&D	D	D	D	D	D	I	Discretionary Grants, Contractor Services	2YR/Community College, 4YR College/University	Education Researchers, 2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/University Learners, 4YR College/ University Instructors, 4YR College/University Mentors, Leaders or Administrators IHE Leaders, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	NPR
NSF		NSF Alliances for Graduate Education and the Professoriate Program	STEM Careers, Institutional Capacity, ED R&D	U	D	I	D	U	U	Discretionary Grants	4YR College/University	4YR College/University Learners, 4YR College/University Instructors, 4YR College/University Mentors, Leaders or Administrators IHE Leaders	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	NPR
NSF		NSF Research Traineeships (NRT)	Engagement, Learning, Postsecondary Degrees, STEM Careers, Institutional Capacity, System Reform, ED R&D	I	D	D	D	D	D	Discretionary Grants, Contractor Services, Cooperative Agreements	4YR College/University	4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	NPR
NSF		Research Experiences for Teachers (RET) in	Educator/ Leader Performa	D	D	D	I	I	D	Discretionary Grants	PK-12 School, 2YR/Community College, 4YR College/University	PK-12 Learners, Pk-12 Teachers, Education Researchers, Principals, Leaders, Administrators	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from	NPR

Agency		Investment	Category							Grant Type	Institution Types	Participant Types	Description	
		Engineering and Computer Science	nce, ED R&D									of PreK - 12 Schools, 2YR College Learners, 2YR College Instructors, 4YR College/ University Learners, 4YR College/University Instructors, 4YR College/ University Mentors	collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	
NSF		Research Experiences for Undergraduates (REU)	STEM Careers	U	I	D	D	I	I	Discretionary Grants	2YR/Community College, 4YR College/University, Non-profit Organization, For-profit Organization, Other	2YR College Learners, 4YR College/University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	NPR
NSF		Robert Noyce Teacher Scholarship Program	Educator/ Leader Performance	D	D	D	D	U	D	Discretionary Grants	PK-12 School, 2YR/Community College, 4YR College/University, Non-profit Organization, Other	PK-12 Learners, Pk-12 Teachers, Education Researchers, Principals, Leaders, Administrators of PreK - 12 Schools, 2YR College Learners, 2YR College Instructors, 4YR College/ University Learners, 4YR College/ University Instructors, Informal STEM Educators, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	NPR
NSF		Scholarships in Science, Technology, Engineering and Math (S-STEM) Core Program	Postsecondary Degrees, STEM Careers, Institutional Capacity, ED R&D	D	D	D	I	I	D	Discretionary Grants	2YR/Community College, 4YR College/University	Education Researchers, 2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/ University Learners, 4YR College/ University Instructors, 4YR College/University Mentors, Leaders or	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	NPR

											Administrators IHE Leaders	
NSF		Training-based Workforce Development for Advanced Cyberinfrastructure (CyberTraining)	Learning, STEM Careers, Institutional Capacity	D	I	D	D	D	D	Discretionary Grants	2YR/Community College, 4YR College/University, Informal Educational/Research Institution	Education Researchers, 2YR College Learners, 2YR College Instructors, 4YR College/ University Learners, 4YR College/ University Instructors, Leaders or Administrators IHE Leaders	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	NPR
NSF		Tribal Colleges and Universities Program (TCUP)	Institutional Capacity	I	D	D	D	I	U	Discretionary Grants	2YR/Community College, 4YR College/University	2YR College Instructors, 4YR College/ University Instructors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info about this investment and/or from this agency, please follow the provided link(s): NSF Ref#1, NSF Ref#2, NSF Ref#3	NPR
SI		STEM Informal Education and Instruction	Engagement, Learning, Educator/ Leader Performance, Postsecondary Degrees, STEM Careers, Institutional Capacity, System Reform, ED R&D	D	D	D	D	D	D	Scholarships, internships, and fellowships; Other (free STEM programming both formal and informal participants)	PK-12 School, 2YR/Community College, 4YR College/University, Informal Educational/ Research Institution, Indian/Native American Tribal Government, Non-profit Organization, Other	PK-12 Learners, Pk-12 Teachers, Education Researchers, Principals, Leaders, Administrators of PreK - 12 Schools, 2YR College Learners, 2YR College Instructors, 2YR College Mentors, 4YR College/ University Learners, 4YR College/ University Instructors, 4YR College/ University Mentors, Leaders or Administrators IHE Leaders, Informal STEM Learners, Informal STEM Educators, Informal STEM Developers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): Dashboard, Race/Ethnicity, Gender, Locality	Link 1 Link 2 Link 3

USDA	NIFA	1890 Facilities Grant Program	See End Note iii	I	I	I	I	I	I	Discretionary Grants	4YR College/ University	4YR College/ University Learners, 4YR College/ University Instructors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR
USDA	NIFA	1890 Institutions Capacity Building Grants Program: Extension	See End Note iii	D	D	D	I	I	I	Discretionary Grants	4YR College/ University	4YR College/ University Learners, 4YR College/ University Instructors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR
USDA	NIFA	1890 Institutions Capacity Building Grants Program: Teaching	See End Note iii	D	D	D	I	I	I	Discretionary Grants	4YR College/ University	4YR College/ University Learners, 4YR College/ University Instructors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR
USDA	NIFA	1890 National Scholars Program (Scholarships for Students at 1890 Institutions)	See End Note iii	D	D	D	I	I	I	Discretionary Grants	4YR College/ University	4YR College/ University Learners, 4YR College/ University Instructors	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR
USDA	NIFA	4-H Science, 4-H Youth Development Program	Institutional Capacity, Engagement, Learning, STEM Careers iv	D	D	D	D	I	D	Other	2YR/Community College, 4YR College/ University Informal Educational/ Research	PK-12 Learners, Informal STEM Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR

USDA	NIFA	Agriculture in the Classroom	See End Note iii	D	I	I	I	I	I	Discretionary Grants	PK-12 School, Non-profit Organization	PK-12 Teachers	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.		NPR
USDA	NIFA	Alaska Native-Serving and Native Hawaiian-Serving Institutions Education Competitive Grants Program	See End Note iii	D	D	D	D	D	I	Discretionary Grants	2YR/Community College, 4YR College/ University	PK - 12 Learners, 2YR College Learners, 4YR College/ University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.		NPR
USDA	NIFA	Hispanic serving Institutions Education Grants Program	See End Note iii	D	D	D	D	D	I	Discretionary Grants	2YR/Community College, 4YR College/ University	PK - 12 Learners, 2YR College Learners, 4YR College/ University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.		NPR
USDA	NIFA	Insular Programs	See End Note iii	D	D	D	D	D	I	Discretionary Grants	2YR/Community College, 4YR College/ University	PK - 12 Learners, 2YR College Learners, 4YR College/ University Learners	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.		NPR
USDA	NIFA	Multicultural Scholars, Graduate Fellowship and Institution Challenge Grants	See End Note iii	I	I	D	I	I	I	Discretionary Grants	4YR College/ University, Informal Educational/ Research	4YR College/ University Learners	55	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more info from this agency/	NPR

		(Graduate Fellowships/National Needs)											investment, please follow the provided link(s): USDA	
USDA	NIFA	NIFA Fellowship Grants Program (AFRI Predoctoral and Postdoctoral Fellowships)	See End Note iii	I	I	D	I	I	I	Discretionary Grants	2YR/Community College, 4YR College/ University, Informal Educational/Research, U.S. Federal Government, For-profit Organization	4YR College/ University Learners, Other – Postdoctoral Fellows	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data. For more information about this investment and/or from this agency, follow the provided link(s): USDA Predocs, USDA Postdocs	NPR
VA		Rogers STEM Scholarship	Learning, Postsecondary Degrees, STEM Careers	I	I	D	I	U	I	Other	4YR College/University	4YR College/University Learners	3,499	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR
VA		VET TEC	Learning, STEM Careers	I	U	D	I	I	D	Other	Other	Veterans	Data collection and/or reporting of participant information varies across investments. Appendix 3 contains information on potential barriers or challenges that preclude an investment from collecting and/or reporting participant data.	NPR

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i Participants chose H/L for ethnicity; these individuals also chose one of the options for race.

ii Renamed to Eddie Bernice Johnson INCLUDES Initiative in Fall 2022.

iii Primary CoSTEM objective - unable to confirm response in time for report release; data in row not reflected in Appendix 4.

iv Data in row not reflected in Appendix 4.