Progress Report on Coordinating Federal Science, Technology, Engineering, and Mathematics (STEM) Education

March 2014

About the Office of Science and Technology Policy

The Office of Science and Technology Policy (OSTP) advises the President on the effects of science and technology on domestic and international affairs. The office serves as a source of scientific and technological analysis and judgment for the President with respect to major policies, plans, and programs of the Federal Government. OSTP leads an interagency effort to develop and implement sound science and technology policies and budgets. The office works with the private sector to ensure Federal investments in science and technology contribute to economic prosperity, environmental quality, and national security. For more information, visit http://www.ostp.gov.

About this document

As called for in the America COMPETES Reauthorization Act of 2010, the National Science and Technology Council's (NSTC) Committee on STEM Education (CoSTEM) released, in May of 2013, the *Federal Science, Technology, Engineering, and Mathematics (STEM) Education 5-Year Strategic Plan* (Strategic Plan). As required by the Act, this report includes an update on Strategic Plan implementation activities, a report on efforts being taken to increase efficiency and coherence across the Federal STEM education portfolio, and a discussion of methods to disseminate information about Federally-supported STEM education research and resources.

This report also includes tables containing Federal STEM Education funding by agency (FY2013-2015) and program (FY2012-2015). These data build on historical reporting of Federal STEM Education investment that appear in the Strategic Plan and in the *Federal Science, Technology, Engineering, and Mathematics (STEM) Education Portfolio* released by CoSTEM in December 2011.

This report is also in fulfillment of the requirement in Title III of the Joint Explanatory Statement for the Consolidated Appropriations Act of 2014 (Public Law 113-76) for the Office of Science and Technology Policy (OSTP) to report to the House and Senate Appropriations Committees on the dissemination of STEM education findings.

Copyright Information

March 24, 2014

Members of Congress,

I am pleased to transmit this update on the Administration's efforts to coordinate Federal investments in science, technology, engineering, and mathematics (STEM) education.

President Obama believes that strong and sustained investment in STEM education is critical for the Nation. In order for the United States to continue to lead the world in science, technology, and innovation and reap the health, security, and economic benefits these disciplines offer, we must improve STEM engagement, learning, and achievement in schools and communities nationwide.

From the beginning of his Administration, the President has focused on several key strategies to improve STEM education:

- Setting ambitious national goals: These goals include moving American kids from middle to top of the pack of international rankings in science and math, preparing 100,000 excellent STEM teachers, producing 1 million more STEM college graduates over a decade, and broadening participation in STEM fields for women and underrepresented minorities.

- Maintaining a strong investment in STEM education even during difficult budgetary times: The President's 2015 Budget invests $2.9 billion in STEM education, an increase of 3.7 percent over the 2014 enacted level.

- Incorporating STEM education into the Administration's overall education reform strategy: For example, the Department of Education's $4 billion *Race to the Top* program included preference to states whose proposals emphasized innovation in STEM education.

- Building a strong "all hands on deck" effort that includes business, non-profits, foundations, and others: The President launched the *Educate to Innovate* campaign including commitments from more than 100 CEOs; more than 150 organizations are stepping up in response to the President's goal of preparing 100,000 excellent STEM teachers and have formed a coalition called *100kin10* with more than $50 million raised; and more than $100 million in philanthropic investments has been committed to support the President's goal of one million more STEM college graduates.

- Deploying the President's personal passion for getting more students excited about science and math: The President has hosted the first-ever White House Science Fairs—three so far—which celebrate student winners of math, science, and robotics competitions. He will host the first-ever Maker Faire

later this year, which will showcase students and adults accessing the tools and skills necessary to design and make just about anything.

The Administration has also prioritized improving the ability of Federal agencies to collaborate to improve STEM education, while reducing the fragmentation of the STEM-education portfolio. In support of that shared goal, Congress passed and President Obama signed the America COMPETES Reauthorization Act of 2010, a key piece of legislation supporting the Federal Government's STEM-education enterprise. As called for in this Act, the Administration formed a Committee on STEM Education (CoSTEM) under the National Science and Technology Council and produced a [Federal STEM Education 5-Year Strategic Plan](#) released in May 2013.

This shared agenda by the Administration and Congress has also resulted in a substantial reduction in the fragmentation of the Federal Government's STEM education portfolio, with the number of STEM-education programs reduced by almost 40 percent in the past two years—from 228 STEM-education programs in 2012 to an estimated 138 as reflected in FY14 agency operating plans.

This progress report describes STEM-education investments in the President's 2015 Budget request, their alignment with the Strategic Plan, and continuing efforts to coordinate agency activities under the CoSTEM, while further reducing fragmentation. This progress report also describes current efforts to disseminate Federal STEM-education resources, as well as potential enhancements to those efforts.

I thank you for your leadership on this national priority and look forward to working with you on this shared agenda.

Sincerely,
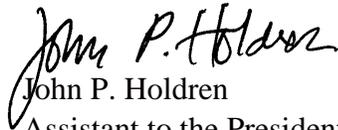
John P. Holdren
Assistant to the President for Science and Technology
Director, Office of Science and Technology Policy

Table of Contents

Department and Agency Abbreviations

Department of Agriculture	USDA
Department of Commerce	DOC
Department of Defense	DOD
Department of Education	ED
Department of Energy	DOE
Department of Health and Human Services	HHS
Department of Homeland Security	DHS
Department of the Interior	DOI
Department of Transportation	DOT
Environmental Protection Agency	EPA
National Aeronautics and Space Administration	NASA
National Institute of Standards and Technology (part of DOC)	NIST
National Institutes of Health (part of HHS)	NIH
National Oceanic and Atmospheric Administration (part of DOC)	NOAA
National Science Foundation	NSF
National Science and Technology Council	NSTC
Nuclear Regulatory Commission	NRC
Office of Science and Technology Policy	OSTP
Smithsonian Institution	SI
United States Geological Survey (part of DOI)	USGS

I. Science, Technology, Engineering, and Mathematics (STEM) Education in the 2015 Budget

> *"Teachers and principals in schools from Tennessee to Washington, D.C.,
> are making big strides in preparing students with skills for the new economy
> – problem solving, critical thinking, science, technology, engineering, and
> math. Some of this change is hard…But it's worth it – and it's working."*

President Barack Obama
State of the Union Address
January 2014

President Obama strongly believes that the United States must equip many more students to excel in science, technology, engineering and mathematics (STEM). That's why the President's 2015 Budget invests $2.9 billion, an increase of 3.7 percent over the 2014 enacted level, in programs across the Federal Government on STEM education. The 2015 Budget includes critical investments in a number of areas that will benefit aspiring students:

- Recruiting, preparing, and supporting excellent STEM teachers, with $40 million to support the President's goal of preparing 100,000 excellent STEM teachers over the next decade and $20 million to launch a pilot National STEM Master Teacher Corps.

- Supporting more STEM-focused school districts, with an investment of $110 million to create new STEM Innovation Networks to better connect school districts with local, regional, and national resources to transform K-12 STEM teaching and learning and $150 million in continued support for the Math and Science Partnerships Program. The Budget also provides $150 million for a new program to redesign high schools to focus on providing students with challenging, relevant learning experiences that will help them gain the knowledge and skills they will need to succeed in today's economy, including in STEM fields.

- Improving undergraduate STEM education, with the National Science Foundation (NSF) investing $118 million to increase retention of undergraduate students in STEM majors and improve undergraduate teaching and learning in STEM subjects to meet the President's goal of preparing 1 million more STEM graduates over the next decade.

- Investing in breakthrough research on STEM teaching and learning, with approximately $50 million for the Advanced Research Projects Agency for Education (ARPA-ED), through which the Department of Education (ED) would support high-risk, high-return research on next-generation learning innovations and technologies, including for STEM education.

In addition, the Budget proposes a fresh reorganization of Federal STEM education programs to enable more strategic investment in STEM education and more critical evaluation of outcomes. This proposal reduces fragmentation of STEM education programs across Government, and focuses on efforts in the five key areas identified by the Federal STEM Education 5-Year Strategic

Plan: (1) K-12 instruction; (2) undergraduate education; (3) graduate education; (4) broadening participation in STEM education and careers by women and minorities traditionally underrepresented in these fields; and (5) education activities that typically take place outside of the classroom.

K-12 Education

The President's 2015 Budget includes investments to improve STEM education in K-12 schools and prioritizes efforts to support excellent teachers, rigorous courses, and regional partnerships that enable school districts to partner with local employers, museums, universities, and others. The Department of Education (ED) will lead this effort with $320 million for the STEM Innovation Initiative with inter-related investments that include:

- STEM Innovation Networks: The Budget invests $110 million to help school districts, individually or in consortia, build strategic partnerships – STEM Innovation Networks – with businesses, universities, museums, Federal science agencies, skilled volunteers, and other educational entities to transform STEM teaching and learning by developing coordinated plans to promote student inspiration, achievement, and preparation in STEM subjects; improve STEM instruction; and build regional networks of support for STEM education. The competitive grant program will support approximately 10 partnerships in its first year, building on promising models such as the partnership between the Ohio STEM Learning Network, the Cleveland Metropolitan School District, GE, and MC2High School. The Budget also provides support for a STEM Virtual Learning Network, a national, online community of STEM educators. The networks will complement the Department of Education's continued $150 million investment in the [Math and Science Partnerships](#) program, a formula grant to all States to support K-12 STEM education.

- Preparing 100,000 Excellent STEM Teachers over the Next Decade: In his 2011 State of the Union address, the President called for a new effort to prepare 100,000 STEM teachers over the next decade with strong teaching skills and deep content knowledge. Answering the President's call to action, more than 150 organizations have formed a coalition called *[100Kin10](#)*. These organizations have made over 150 measurable commitments to increasing the supply of excellent STEM teachers; hiring, developing, and retaining excellent STEM teachers; and building the *100Kin10* movement. *100Kin10* has launched two funds totaling over $50 million provided by a broad range of foundations and philanthropists under a unique "funding marketplace" through which funders have access to a registry of high-quality projects. To build on these private-sector investments, ED is proposing $40 million in the 2015 Budget to support evidence-based STEM teacher preparation programs to recruit and train effective STEM teachers for high-need schools.

- National STEM Master Teacher Corps: The Budget also includes $20 million to launch a pilot of the National STEM Master Teacher Corps, a new effort to enlist some of America's best and brightest science and math teachers that will help improve instruction in their schools and districts, and to serve as a national resource for best practices in math and science teaching.

The President's Budget makes other investments to support ED's STEM Innovation Initiative:

- Redesigning high schools to teach real-world skills: The President has called for a comprehensive effort to rethink the high-school experience, challenging schools to scale up innovative models that personalize teaching and learning so students receive the rigorous and relevant education needed to graduate and transition into postsecondary learning and careers. The Budget provides $150 million for a new program to redesign high schools to focus on providing students with challenging, relevant learning experiences that include partnerships with colleges, employers, and other entities designed to enhance instruction and deliver opportunities students need to gain the knowledge and skills that will help them succeed in today's economy, including in key STEM fields. Additional resources would be provided through the Opportunity, Growth, and Security Initiative.

- Identifying and scaling promising STEM education practices: The Administration proposes over $100 million to support NSF's Discovery Research K-12, which supports research on teaching and learning STEM and by dedicating a portion of the ED's Investing in Innovation (i3) program to developing, validating, or scaling effective interventions or strategies with promise in STEM education. In addition, in coordination with the ED, the National Institutes of Health (NIH) will invest $15 million in the Science Education Partnership Award (SEPA) program, leveraging the expertise of the biomedical research community to support K-12 STEM education.

- Helping more military-impacted students get access to rigorous STEM courses: Since 2011, the Department of Defense (DOD) has partnered with the non-profit National Math and Science Initiative to expand access to Advanced Placement courses in 40 military-connected public high schools. With additional investments by private-sector partners, 31 additional schools are now participating in the NMSI's Initiative for Military Families. Through this strategic public-private partnership, since 2011, those 71 schools have observed, on average, a 67 percent increase in the number of passing math, science, and English AP scores - more than nine times the national average, while African-American and Hispanic students saw an 80 percent increase and young women experienced a 62 percent increase in passing math and science AP scores. Building on this success, the Department of Defense will continue to work to bring this AP program to additional schools and communities.

Undergraduate STEM Education

The focus of the Budget's undergraduate STEM education investments is on supporting the President's goal to increase the number of well-prepared graduates with STEM degrees by one million over the next 10 years, including investments to:

- Transform undergraduate teaching and learning with NSF investments: The Budget proposes $118 million at NSF for a consolidated program to implement evidence-based instructional practices, expand the evidence base, and support research on how new

technologies can facilitate adoption and use of new approaches to instruction. The Budget also proposes $75 million for NSF's Research Experiences for Undergraduates (REU) program to provide early opportunities to conduct research, which can be especially influential in maintaining a student's interest in science, engineering, and mathematics.

- Improve STEM education at community colleges: The Administration proposes over $60 million for NSF's Advanced Technological Education (ATE) program, which centers on education of technicians for high-technology fields, with a focus on partnerships between academic institutions and employers.

Graduate Education

The focus of the 2015 Budget's graduate STEM education investments is on preparing highly-skilled scientists and engineers who will support American innovation. Key investments in this goal include:

- Enhancing NSF's efforts to train tomorrow's workforce: The Budget provides $333 million to support thousands of outstanding graduate-student researchers who will be tomorrow's leaders in the innovation economy in a range of careers. The Budget provides $7 million at NSF for a new program to spark innovation in graduate education by providing awards to universities to explore new approaches to training graduate students.

- Continuing support for major graduate training programs, including the NIH's Ruth L. Kirschstein National Research Service Award Institutional Research Training Grants, which provide funding to prepare individuals for careers in the biomedical, behavioral, and social sciences. In addition, the DOD will invest over $80 million in the Science, Mathematics and Research for Transformation (SMART) scholarship and the National Defense Science and Engineering Graduate (NDSEG) programs to meet key national security workforce needs.

Informal STEM Education

The President believes that we need to give many more boys and girls engaging STEM experiences that show them the potential of these high-wage careers. That's why he hosted the first-ever White House Science Fairs, recorded a video urging students to try an hour of code and connect a million minds, challenged students to be "makers of things", and called on the Nation's 200,000 Federal scientists and engineers to volunteer in their local communities and think of creative ways to engage students in STEM subjects.

In addition, later this year, the Administration will host its first-ever White House Maker Faire, which will include commitments by leading organizations to help more students access the tools and skills necessary to design and make just about anything and pursue careers in design, advanced manufacturing, and related STEM fields.

The 2015 Budget builds on the President's leadership with key investments that include:

- Identifying and scaling best practices to engage youth in STEM: The Administration proposes $55 million for NSF's Advancing Informal Science Learning program, focusing on the research and model-building contributions of the program to better understand effective means and innovative models for engaging today's young people and adults in science outside of school settings. In addition, ED will identify further opportunities to leverage the 21st Century Community Learning Centers program to bring more students access to effective and engaging STEM activities outside of the traditional school day.

- Leadership by the Smithsonian Institution and the broader museums and library community: The Budget provides $10 million to the Smithsonian Institution to improve the reach of informal STEM education by ensuring that materials are aligned with what students are learning in the classroom. In addition, the Institute of Museum and Library Services (IMLS) will prioritize support for STEM and "making" programs within existing IMLS funding streams, with special emphasis on at-risk youth.

- Supporting High-Quality Informal STEM Education Programs at NASA: The Budget supports NASA's efforts to internally restructure and better integrate its STEM education program to reach more students and teachers, with $26 million for the for the STEM Education and Accountability Projects program to fund the most effective agency education projects and a complementary $15 million for NASA's Science Directorate to competitively fund the best application of NASA Science assets to meet the Nation's STEM education goals.

Broadening Participation in STEM Education and Careers

The Budget sustains support for key programs to broaden participation in STEM education to women and minorities traditionally underrepresented in many of these fields.

- Strong support for broadening participation at NSF: $32 million for NSF's Historically Black Colleges and Universities Undergraduate Program (HBCU-UP); $46 million for the Louis Stokes Alliances for Minority Participation (LSAMP); and $13.5 million for the Tribal Colleges and Universities Program (TCUP).

- NASA education effort to reach underserved students: $30 million for NASA's Minority University Research and Education Program (MUREP) which strives to ensure that underrepresented and underserved students participate in NASA education and research projects and to assist more students in their pursuit of STEM careers.

Supporting Innovation and Next-Generation Learning Technologies

Building on the President's *Strategy for American Innovation* and the Administration's commitment to tackle the Grand Challenges of the 21st Century, the Budget provides support for:

- ARPA-ED: approximately $50 million for the Advanced Research Projects Agency for Education (ARPA-ED), a "DARPA for Education." ARPA-ED will allow the Department of Education to support high-risk, high-return research on next-generation learning innovations and technologies. It will advance the field of education research, development, and demonstration by sponsoring the synthesis and vetting of public and private R&D efforts; identifying breakthrough development opportunities; shaping the next wave of R&D; investing in the development of new education innovations and technologies, learning systems, and digital learning materials; and identifying and transitioning the best and most relevant R&D from other Federal agencies.

- Virtual Learning Lab: In addition, ED's Institute of Education Sciences (IES) and NSF will collaborate on a "Virtual Learning Laboratory" initiative, investing to support rapid experimentation and use of "Big Data" to discover better ways to help students master important concepts in core academic subjects such as STEM.

These investments in next-generation learning technologies will complement the Administration's ConnectED initiative. The President has called on the Federal Communications Commission to take steps to connect 99 percent of American students to the digital age through next-generation broadband and high-speed wireless in their schools and libraries. The Budget proposes $200 million at ED for the ConnectEDucators program to ensure that students receive the full benefit of connectivity by providing professional development opportunities that help teachers make effective use of these new resources. The Opportunity, Growth, and Security Initiative would dedicate an additional $300 million to this effort, providing a total of 100,000 teachers in 500 school districts across the country with access to professional development.

Making the Most of Our STEM Education Investments

The President's 2015 Budget maintains a strong commitment to STEM education and supports the core principles of the 2014 Budget proposal and the goals of the Five-Year Strategic Plan, while making important changes that reflect valuable input from the STEM education community. For example:

- The Administration is not requesting a transfer of funding between agencies. As a result, some agencies have had a portion of their STEM education funds restored compared to the 2014 Budget proposal. This means, for example, that funding is provided to NASA, NIH, and the National Oceanic and Atmospheric Administration (NOAA) to ensure that the STEM education community can take advantage of these agencies' respective areas of expertise.

- Agencies will focus on internal consolidations and eliminations, while funding their most effective programs. As a result, the 2015 Budget continues to reduce fragmentation, building on the substantial number of internal consolidations and eliminations that agencies began implementing in 2013 and 2014.

- Agencies will coordinate their STEM education investments through implementation of the Federal STEM Education Five-Year Strategic Plan, looking for opportunities to build the evidence base, share what works, and leverage each other's expertise and resources.

- To support these and related activities, the Budget provides tangible support for the work agencies are doing to implement the Five-Year Strategic Plan, with a focus on building and using evidence-based practices and developing new interagency models for leveraging assets and expertise.

II.   Progress on the Federal STEM Education 5-Year Strategic Plan

The Federal STEM Education 5-Year Strategic Plan (Strategic Plan), released in May 2013, was the result of substantial work by the Administration to identify strategic priorities for STEM education investment, ways that agencies could collectively contribute to those goals, and to continue to grow the evidence base of what works in STEM education.

Many Federal agencies place a high priority on STEM education and have developed initiatives unique to their agency's mission, vision, and resources. The Strategic Plan builds upon these efforts and identifies five priority investment areas, each with a corresponding national goal toward which Federal agencies and their partners in state and local entities and the private sector, should aspire:

- Improve STEM Teacher Training: Prepare 100,000 excellent new K-12 STEM teachers by 2020, and support the existing STEM teacher workforce;

- Increase and Sustain Youth and Public Engagement in STEM: Support a 50 percent increase in the number of youth in America who have authentic STEM experiences each year, prior to completing high school;

- Enhance STEM Experience of Undergraduate Students: Graduate 1 million additional students with degrees in STEM fields over a decade;

- Better Serve Groups Historically Under-represented in STEM Fields: Increase the number of underrepresented minorities that graduate with STEM degrees in the next 10 years and improve women's participation in areas of STEM where they are significantly underrepresented; and

- Design Graduate Education for Tomorrow's STEM Workforce: Provide graduate-trained STEM professionals with basic research foundational expertise, options to acquire specialized skills in areas of national importance and mission agency's needs, and ancillary skills needed for success in a broad range of careers.

In addition, CoSTEM agencies recognize that improved coordination and collaboration across the Federal STEM education investment portfolio is necessary to make the most effective use of their resources and expertise. Accordingly, the Strategic Plan outlines two priority coordination approaches:

- Build new models for leveraging assets and expertise. Implement a concept of lead and collaborating agencies to leverage capabilities across agencies to ensure the most significant impact of Federal STEM education investments.

- Build and use evidence-based approaches. Conduct STEM education research and evaluation to build evidence about promising practices and program effectiveness, use across agencies, and share with the public to improve the impact of the Federal STEM education investment.

Progress on Strategic Plan Implementation

The Strategic Plan laid out draft implementation roadmaps in each of the priority STEM education investment and coordination areas, and proposed potential short, medium, and long-term objectives and strategies to help Federal agencies achieve the goals described.

With the release of the Strategic Plan, the CoSTEM directed the Taskforce on Federal Coordination in STEM Education (FC-STEM) to undertake planning for Strategic Plan implementation. As of January 2014, FC-STEM continues this implementation role and has been re-chartered as the Subcommittee on Federal Coordination in STEM Education under the CoSTEM.

In addition, since the release of the plan, FC-STEM has launched five working groups, each tasked with executing one of the five strategic objectives to improve P-12 STEM instruction, increase and sustain youth and public engagement in STEM, enhance the STEM experience of undergraduate students, better serve groups historically underrepresented in STEM fields, and design graduate education for tomorrow's STEM workforce.

These interagency groups have convened over the last year to begin Strategic Plan implementation. Across priority areas, these working groups are planning new pilot projects that leverage agency assets and expertise to improve the reach of STEM content in formal school and afterschool settings; increasing coordination across agencies to identify meaningful opportunities and experiences for P-12 teachers, undergraduate, and graduate students; identifying localities with common grantees to best leverage Federal investment; and developing common data collection strategies for improved evaluation.

Some early highlights of their work include:

- The **P-12 STEM instruction group** is addressing the near-term goal of identifying ways that multiple agencies can support STEM teachers in high-need districts and in expanding authentic STEM opportunities for P-12 teachers. Agencies are also working on common definitions which will allow increased syncing and evaluation of programs and on sharing existing examples of outreach and assessment.

- Agencies in the **informal STEM education group** are sharing information on existing investments and evaluations of different activities that give students the opportunity to discover, create, and invent, with the goal of supporting scale-up for the most promising strategies.

- Agencies in the **graduate education group** are exploring ways to make it easier for students and administrators to learn about fellowship and traineeship opportunities offered across the Federal government. In addition, they are exploring where additional training or workforce alignment is needed in graduate programs and how the Federal resources in STEM graduate education can support these program and curricular improvements.

To further support these interagency efforts and institutionalize the STEM Education Strategic Plan into agency performance metrics, the STEM Education Strategic Plan has also been recently codified as a Cross Agency Priority Goal, toward the achievement of which multiple Federal agencies come together around a central priority.

Going forward, CoSTEM and FC-STEM will continue to make progress on Strategic Plan implementation, with particular focus on short- and medium-term implementation goals. The working groups will also incorporate input from the STEM education community and make the adjustments needed to ensure progress on the shared goal of giving more Americans access to critical STEM skills.

III.   Reducing Fragmentation and Duplication of STEM Education Programs

Leadership by this Administration and Congress has already resulted in substantial reduction in the fragmentation of the STEM education portfolio, with the number of STEM education programs reduced by almost 40 percent in the past two years. This reduction from approximately 228 STEM education programs in 2012 to an estimated 138 as reflected by FY14 agency operating plans, has improved the ability of agencies to evaluate programs, locate strategic partners, and deploy resources against priorities. The President's 2015 Budget builds on this record by further reducing fragmentation to 111 requested programs.

Internal Consolidations

The primary mechanism for reducing fragmentation has been internal agency-level consolidations. Notable examples include:

- Major reorganization of NASA's education investments, by consolidating education efforts currently spread throughout the agency to within the Office of Education's STEM education and Accountability Projects (SEAP) program. Through a competitive process, the Office of Education will identify and support the most effective STEM education activities across NASA. Additionally, the President's FY15 Budget provides $15 million for NASA's Science Mission Directorate to fund, also through a competitive process, the best application of NASA's science assets to meet the Nation's STEM goals.

- Consolidation of NSF education investments, helping NSF to focus on improving the research base and delivery of undergraduate STEM education. NSF is also bringing greater coherence to its undergraduate education investments by creating an agency-wide framework to guide those investments.

Cross-Agency Partnerships

Under CoSTEM and the STEM Education Strategic Plan, agencies have also begun a number of efforts to reduce duplication through increased coordination and collaboration. These efforts include:

- NASA's growing partnership with the Department of Education's 21st Century Community Learning Center program: In 2013, NASA began a pilot with ED's $1.2 billion 21st Century Community Learning Center (21stCCLC) program, which is estimated to serve over 1.6 million students. NASA customized online STEM challenges and associated curriculum materials aligned to 21stCCLC objectives, working with three 21stCCLC states: Colorado, Michigan, and Virginia. NASA and ED are now using the results from the pilot to draft a framework for other Federal collaborations to customize agency STEM education content for the 21stCCLC community.

- Common research guidelines, and other resources to support agency STEM education investments: ED and NSF have developed common guidelines for education research. The guidelines include suggestions for describing high-quality work within six education research study types: (1) foundational research; (2) early stage and exploratory research; (3) design and development projects; (4) efficacy studies; (5) effectiveness studies; and (6) scale-up studies. The evidence guidelines are intended to be used by prospective grantees, Federal agency staff members, and merit reviewers. NSF has begun work with several other agencies to develop opportunities for broader professional development, such as internships at Federal labs or in industry, for students in its graduate fellowship program and exploring a common graduate fellowship portal to reach more students.

Agencies are also collaborating as part of larger multi-sector coalitions, such as *100Kin10*, a partnership of over 150 organizations working together to meet the President's goal of training 100,000 excellent STEM teachers over the next decade. *100kin10* now includes ED, the Department of Energy, NASA, NSF, and NOAA as members.

The President's 2015 Budget builds on these efforts with investments that improve the ability of agencies to leverage each other's grant-making expertise, regional infrastructure, and ability to collect data – all with the goal of reaching more students and more teachers more effectively. These include:

- **Department of Education**'s 2015 Budget requests $110 million for supporting STEM Innovation Networks, regional partnerships among school districts, Federal science agencies, universities, museums, and other partners to transform teaching and learning.

- **NIH**'s 2015 Budget requests approximately $15 million for the Science Education Partnerships Awards program, which will for the first time be coordinated with the Department of Education to support more grants going to school districts most in need of assistance.

- **Smithsonian Institution**'s 2015 Budget requests $10 million to work with Federal agencies and other science partners to harness their unique expertise and resources to create relevant materials and on-line resources, and to harness Smithsonian's effective delivery mechanisms to reach more students. Their efforts will include build on an existing cross-agency pilot with NOAA, NASA, NIH, EPA, DOD, and the National Park Service on promoting stewardship of water, a project which has fostered strong partnerships among agencies.

- **NOAA**'s 2015 Budget requests $2 million for the NOAA Office of Education to provide expertise, materials, and technical assistance from NOAA's science offices to improve K-12 STEM education programs.

- **Department of Defense**'s 2015 Budget continues support for inter-agency programs such as its Awards to Stimulate and Support Undergraduate Research Experiences (ASSURE) Program, which supports undergraduate research in DoD-relevant disciplines by sub-selecting from a larger NSF program solicitation.

- **National Science Foundation**'s 2015 Budget provides funding for NSF to collect data to better understand the state of the STEM workforce and the outcome of Federal programs aimed at addressing workforce needs and broadening participation.

IV.   Improving Dissemination of Federal STEM Education Resources

This section responds to Congressional interest in a "single-stop" repository for the dissemination of Federal STEM education resources by describing current dissemination efforts and potential next steps that agencies can take to better integrate these activities.

Current Dissemination Efforts

The National Science Foundation (NSF) and the Department of Education (ED) have existing mechanisms for making content from federally funded education research available to the public.

One of the most well-known of these is the What Works Clearinghouse (WWC) led by ED's Institute for Education Sciences (IES). The goal of WWC is to provide resources to enable informed decision-making in education at multiple levels across a wide range of topics, including science and math. WWC provides practice guides with recommendations for educators, reports that summarize findings from multiple studies of a particular program, reviews assessing a single research study of a program, and quick reviews of recent research. The content reviewed and presented in WWC is a subset of the available Federal research in education, including only those studies that meet pre-defined rigorous standards that have been reviewed by the WWC team.

IES also maintains the Education Resources Information Center (ERIC), an online, searchable catalog of education research papers and information. ERIC contains bibliographic records including citations, abstracts, and other data dating back to 1966; beginning in FY12, peer-reviewed research papers resulting from new IES grants have been required to be submitted to the collection. The ERIC digital library is a more comprehensive listing of research papers and information than the WWC, but no systematic review of the rigor of a particular study or evidence base is done.

Many educational research programs funded by the NSF Directorate for Education and Human Resources (EHR) have maintained "resource networks" to provide capacity building and technical assistance to the researchers and offer some information about the program to the public. Some of these include: the Math and Science Partnership Network, the Center for Advancing Research and Communication in STEM, and the Center for the Advancement of Informal Science Education. Each resource network is maintained by the individual program, so the levels of content useful to educators and the public vary.

Other federally funded collections of learning resources include the Learning Registry and the National Science Digital Library. The Learning Registry is an online network of educational resources voluntarily submitted by both Federal and non-Federal sources that offers educators a single searchable library of educational materials in lieu of multiple disparate databases and websites. A joint effort of ED and the DOD, with both Federal and non-Federal partners, coding for the Learning Registry was recently completed and ED is working to increase participation by content providers who voluntarily include their materials in the service. The Learning Registry focuses on providing content and applications designed for classrooms more than on results from scholarly research. The National Science Digital Library (NSDL) is an NSF-funded online library

providing education resources specifically in the STEM disciplines. Like the Learning Registry, NSDL is not a repository holding the information that educators or researchers may wish to find, but rather provides the capability to search the suite of resources that external providers have made accessible to the library.

The private sector also maintains some similar content-driven websites. The Best Evidence Encyclopedia, run by the Johns Hopkins University Center for Data-Driven Reform in Education, provides summaries of scientific reviews of research findings and measures of effectiveness for education programs. Like WWC, its intent is to provide a wide range of information to enable informed decision-making in education at many levels. The Coalition for Evidence based Policy's "Top Tier Evidence Initiative" evaluates select social programs (including some education programs) that meet the evidence standard of a "well-designed randomized control trial [showing] sizable, sustained effects on important…outcomes" and provides decision-makers with the ability to distinguish evidence-driven programs from others.

Potential Enhancements

To create the one-stop resource as envisioned in Congress' informational request, the most straightforward path is to build upon the infrastructure already developed by NSF and ED, with the goal of making their existing activities more useful to a broader set of communities, including researchers and practitioners.

There are a wide range of stakeholders with interests in education research, each with different needs and seeking solutions to different questions. For example, research results as published in scholarly journals are often most useful to fellow researchers, not necessarily to school districts or educators seeking evidence-based curricula or programs. Translating from data-supported research results published by scientists to evidence-based programs that can be considered by school districts and to applications and curricula that can be implemented by teachers in the classroom requires additional work that is performed only in part by many of the existing services.

With additional support, a joint effort led by NSF EHR and ED IES could build on existing expertise to expand its infrastructure to meet the needs of multiple communities – for example, providing scholarly research results to the research community as is currently done through WWC and ERIC and also presenting or developing evidence-based practice guides intended for practitioners, some of which can currently be found through the WWC, the Learning Registry, and NSDL.

Leveraging the investments already made by IES in WWC and ERIC and by NSF in the resource networks and searchable catalogs like the Learning Registry and NSDL will enable the Federal government to avoid the duplicative effort of starting from scratch and capitalize on some of the utility and public-facing recognition that have already been demonstrated by these resources.

Table 1. Federal STEM Education Funding by Agency

Table 1. Federal STEM Education Funding by Agency

(budget authority in millions)

	2013 Actual	2014 Enacted	**2015 Budget**
Agriculture	74	91	**78**
Commerce	33	35	**22**
Defense	137	129	**102**
Education	462	485	**658**
Energy	68	43	**41**
Health and Human Services	599	602	**601**
Homeland Security	11	6	**5**
Interior	3	2	**2**
Transportation	87	86	**100**
Environmental Protection Agency	17	17	**2**
NASA	141	127	**116**
National Science Foundation	1,176	1,179	**1,182**
Nuclear Regulatory Commission	15	16	**1**
Smithsonian Institution	0	0	**10**
Total Federal STEM Education	2,823	2,817	**2,920**

AGENCY	SUB-AGENCY	PROGRAM	2012 Enacted	2013 Actual	2014 Enacted	2015 Budget
Agriculture	NIFA	1890 Facilities Grant Program	19.7	18.2	19.7	19.7
Agriculture	NIFA	1890 Institutions Capacity Building Grants Program:	6.4	6.0	6.4	6.4
Agriculture	NIFA	1890 Institutions Capacity Building Grants Program: Teaching	6.4	6.0	6.4	6.4
Agriculture	NIFA	4-H Science, 4-H Youth Development Program	24.0	22.8	25.2	23.5
Agriculture	APHIS	AgDiscovery	0.5	0.5	0.5	0.5
Agriculture	NIFA	Agriculture in the Classroom	0.6	0.5	0.6	-
Agriculture	NIFA	AITC Secondary Postsecondary Agriculture Education Challenge Grants (SPECA)	0.9	0.8	0.9	-
Agriculture	NIFA	Alaska Native-Serving and Native Hawaiian-Serving Institutions Education Competitive Grants Program	3.2	3.0	3.2	3.2
Agriculture	NIFA	Distance Education Grants for Institutions of Higher Education in Insular Areas (DEG)	0.8	-	-	-
Agriculture	NIFA	Food and Agricultural Sciences National Needs Graduate and Postgraduate Fellowship Grant Program	3.2	-	-	-
Agriculture	NIFA	Higher Education Challenge Grants (HEC)	4.8	-	-	-
Agriculture	NIFA	Higher Education Multicultural Scholars Program (MSP)	1.0	-	-	-
Agriculture	NIFA	Hispanic-Serving Institutions Education Grants Program	9.2	8.5	9.2	9.2
Agriculture	NIFA	Insular Programs	-	1.5	1.8	1.8
Agriculture	NIFA	Multicultural Scholars, Graduate Fellowship and Institution Challenge Grants	-	-	9.0	-
Agriculture	NIFA	NIFA Fellowship Grants Program	6.1	6.3	7.3	7.5
Agriculture	NIFA	Resident Instruction Grants Program for Institutions of Higher Education in Insular Areas	0.9	-	-	-
Agriculture	NIFA	Women and Minorities in Science, Technology, Engineering and Mathematics Fields Program (WAMS)	0.4	0.4	0.4	-
Commerce	NOAA	Competitive Education Grants (including Environmental Literacy Grants)	5.1	3.4	3.6	-
Commerce	NOAA	Coral Reef Conservation Program	0.5	0.5	-	-
Commerce	NOAA	Dr. Nancy Foster Scholarship Program	0.5	0.5	0.5	-
Commerce	NOAA	Educational Partnership Program with Minority Serving Institutions	12.5	13.0	14.4	12.4
Commerce	NOAA	Ernest F. Hollings Undergraduate Scholarship Program	4.9	5.1	5.3	5.5
Commerce	NOAA	National Estuarine Research Reserve System	0.6	-	-	-
Commerce	NOAA	National Sea Grant College Program	0.8	0.8	1.0	-

AGENCY	SUB-AGENCY	PROGRAM	2012 Enacted	2013 Actual	2014 Enacted	2015 Budget
Commerce	NIST	NIST Summer Institute for MIddle School Teachers	0.3	0.3	0.3	-
Commerce	NOAA	NOAA Bay Watershed Education and Training (B-WET)	5.5	6.7	7.2	-
Commerce	NOAA	NOAA Fisheries Education Program	3.5	-	-	-
Commerce	NOAA	NOAA Office of Ocean Exploration and Research (Education	0.9	-	-	-
Commerce	NOAA	NOAA Teacher at Sea Program	0.6	0.6	0.6	-
Commerce		Office of Education-STEM Coordination	-	-	-	2.0
Commerce	NOAA	Satellite and Information Service	3.2	0.4	-	-
Commerce	NIST	STEM Pipeline for the Next Generation Scientists and Engineers.	0.4	1.0	1.0	1.0
Commerce	NIST	Summer Undergraduate Research Fellowship (SURF)	0.8	0.9	0.8	0.8
Defense		Army Educational Outreach Program (AEOP)	8.2	8.4	9.4	9.3
Defense		Awards to Stimulate and Support Undergraduate Research Experiences (ASSURE)	4.5	4.5	4.5	4.5
Defense		DoD STARBASE Program	25.0	25.0	25.0	-
Defense		Iridescent Learning	2.5	1.6	-	-
Defense		National Defense Education Program (NDEP) K-12	16.6	12.0	-	-
Defense		National Defense Education Program (NDEP) Science, Mathematics And Research for Transformation (SMART)	43.3	40.3	46.3	45.5
Defense		National Defense Science and Engineering Graduate (NDSEG) Fellowship Program	39.7	33.5	36.0	36.0
Defense		National Science Center (NSC)	1.9	1.5	-	-
Defense		Navy - Science and Engineering Apprenticeship Program (SEAP)	0.8	1.0	1.0	1.0
Defense		Navy Historically Black Colleges and Universities/Minority Institutions Research and Education Partnership	1.4	0.5	0.6	0.9
Defense		SeaPerch	1.5	1.1	1.1	-
Defense	NSA	Stokes Educational Scholarship Program	2.0	1.8	1.9	1.6
Defense		The Naval Research Enterprise Intern Program (NREIP)	1.3	1.3	1.3	1.3
Defense		Uniformed Services University of the Health Sciences	0.5	0.5	-	-
Defense		University Laboratory Initiative (ULI)	2.2	2.1	-	-
Defense		University NanoSatellite Program	1.2	1.6	1.6	1.6
Education	OPE	Developing Hispanic Serving Institutions STEM and articulation programs	100.0	94.9	92.8	92.8
Education	OPE	Graduate Assistance in Areas of National Need (GAANN)	30.9	29.3	29.3	29.3

AGENCY	SUB-AGENCY	PROGRAM	2012 Enacted	2013 Actual	2014 Enacted	2015 Budget
Education	IES	High School Longitudinal Study of 2009	6.7	5.7	4.7	4.8
Education	OII	Investing in Innovation	28.5	21.0	25.0	25.0
Education	OESE	Mathematics and Science Partnerships/Effective Teaching and Learning for a Complete Education	149.7	141.9	149.7	149.7
Education	OPE	Minority Science and Engineering Improvement Program	9.5	9.0	9.0	9.0
Education	IES	Research in Special Education	3.3	1.2	3.9	4.5
Education	IES	Research, Development, and Dissemination	31.2	35.7	35.0	35.0
Education	OESE	STEM Innovation Networks	-	-	-	170.0
Education	OPE	Strengthening Predominantly Black Institutions	5.7	5.7	5.7	5.7
Education	OESE	Teacher Incentive Fund	40.3	-	-	-
Education	OPE	Teacher Loan Forgiveness	67.3	77.6	87.0	89.0
Education	OPE	Upward Bound Math and Science Program	43.8	40.5	43.1	43.1
Energy	Office of Energy Efficiency	Advanced Vehicle Competitions	2.0	1.9	2.0	2.5
Energy	Office of Science	American Chemical Society Summer School in Nuclear and Radiochemistry	0.1	1.0	0.4	-
Energy	Office of Science	Community College Internship (formerly Community College Institute of Science and Technology)	0.6	0.7	0.7	1.0
Energy	Office of Science	Computational Sciences Graduate Fellowship 1/	6.0	11.4	-	-
Energy	Office of Science	Global Change Education Program	0.6	-	-	-
Energy	Office of Energy Efficiency and Renewable Energy, Vehicle Technologies	Graduate Automotive Technology Education	1.0	0.9	-	-
Energy	Office of Science	Graduate Student Research Program (formerly Office of Science Graduate Fellowship) 2/ 3/	5.0	3.0	8.7	-
Energy	Office of Environmental Management	HBCU Mathematics, Science & Technology, Engineering and Research Workforce Development Program	8.3	8.0	8.0	8.0
Energy	Office of Energy Efficiency and Renewable Energy, Water Power	Hydro Research Fellowships	0.8	1.4	-	-
Energy	Office of Energy Efficiency and Renewable Energy, Advanced Manufacturing	Industrial Assessment Centers	4.3	5.3	5.3	6.0

AGENCY	SUB-AGENCY	PROGRAM	2012 Enacted	2013 Actual	2014 Enacted	2015 Budget
Energy	Office of Economic Impact and Diversity	Minority Educational Institution Student Partnership Program	1.2	-	-	-
Energy	Office of Energy Efficiency and Renewable Energy, Solar Energy Technologies	Minority University Research Associates Program (MURA)	0.5	-	-	-
Energy	Office of Science	National Science Bowl	2.7	2.8	2.8	2.9
Energy	Office of Science	National Undergraduate Fellowship Program in Plasma Physics and Fusion Energy Sciences	0.4	0.3	-	-
Energy	Office of Science	Plasma/Fusion Science Educator Programs	0.8	0.4	-	-
Energy	Office of Science	QuarkNet	0.6	0.6	0.6	-
Energy	Office of Science	Science Undergraduate Laboratory Internships	6.5	7.3	7.8	8.3
Energy	Office of Energy Efficiency and Renewable Energy, Building Technologies	Solar Decathlon	4.2	3.8	2.2	3.0
Energy	Office of Fossil Energy	Special Recuitment Programs/Mickey Leland Fellowship	0.7	0.7	0.7	0.7
Energy	Office of Science	Visiting Faculty Program (formerly Faculty and Student Teams)	1.2	1.3	1.3	1.7
Energy	Office of Energy Efficiency and Renewable Energy, Wind Energy	Wind for Schools	0.6	0.6	-	-
Energy	Office of Science	U.S. Particle Accelerator Training	0.6	0.6	0.6	0.6
Energy	Office of Science	Graduate Student Research Program	-	-	2.0	2.5
Energy	Office of Science	GEARED (Grid Engineering for Accelerated Renewable Energy Deployment) 4/	-	15.1	-	-
Energy	Office of Energy Efficiency and Renewable Energy, Solar Energy	DISTANCE-Solar (Diversity in Science and Technology Advances National Clean Energy in Solar) 4/	-	1.1	-	-
Energy	Office of Environmental Management	Subsurface Remediation and Project Management Traineeship	-	-	-	2.0

AGENCY	SUB-AGENCY	PROGRAM	2012 Enacted	2013 Actual	2014 Enacted	2015 Budget
Energy	Office of Energy Efficiency and Renewable Energy, Advanced Manufacturing	Wide Bandgap Power Electronics Traineeship	-	-	-	2.0
EPA	ORD	Cooperative Training Partnership in Environmental Sciences Research	0.5	0.5	0.7	0.1
EPA	Office of Environmental Education	Environmental Education Grants	3.5	-	-	-
EPA	ORD	Greater Research Opportunities (GRO) Fellowships for Undergraduate Environmental Study	2.1	1.8	1.8	-
EPA	Office of Environmental Education	National Environmental Education and Training Partnership	2.0	2.0	2.2	-
EPA	ORD	P3-People, Prosperity & the Planet-Award: A National Student Design Competition for Sustainability	3.1	2.5	2.1	1.7
EPA	NCER	Science to Achieve Results Graduate Fellowship Program	14.0	9.3	9.3	-
EPA	ORD	University of Cincinnati/EPA Research Training Grant	0.6	0.6	0.6	0.6
HHS	NIH, NIGMS	Bridges to the Baccalaureate Program	6.3	6.0	6.2	6.2
HHS	NIH, NCI	Cancer Education Grants Program	6.4	6.4	6.6	6.6
HHS	NIH, Intramural Training	Clinical Research Training Program	0.2	-	-	-
HHS	NIH, Office of Science	Curriculum Supplement Series 5/	0.3	0.2	-	-
HHS	NIH, NINDS	Diversity Research Education Grants in Neuroscience	2.7	1.0	1.0	-
HHS	NIH, Intramural Training	Graduate Program Partnerships	-	11.3	11.7	11.7
HHS	HRSA	Health Careers Opportunity Program	15.0	14.0	-	-
HHS	NIH, NIGMS	Initiative for Maximizing Student Development	2.7	-	-	-
HHS	NIH, NLM	Institutional Grants for Research Training in Biomedical Informatics	0.2	-	-	-
HHS	NIH, NIGMS	MARC U-STAR NRSA Program	18.2	19.8	20.4	20.4
HHS	NIH, NICHD	Mathematics and Science Cognition and Learning (MSCL)	3.7	9.8	10.1	10.1
HHS	NIH	Medical Research Scholars Program (MRSP)	-	0.1	0.1	0.1
HHS	NIH, NCI	National Cancer Institute Cancer Education and Career Development Program	0.9	17.0	17.5	17.5
HHS	NIH, Office of Science	Office of Science Education K-12 Program 5/	2.2	0.2	-	-
HHS	NIH, Intramural Training	Post-baccalaureate Intramural Research Training Award	-	19.2	19.8	19.8
HHS	HRSA	Public Health Traineeship	1.6	-	-	-

AGENCY	SUB-AGENCY	PROGRAM	2012 Enacted	2013 Actual	2014 Enacted	2015 Budget
HHS	NIH, NIGMS	RISE (Research Initiative for Scientific Enhancement)	6.3	-	-	-
HHS	NIH	Ruth L. Kirschstein National Research Service Award Institutional Research Training Grants (T32, T35)	487.1	458.5	473.2	473.2
HHS	NIH	Ruth L. Kirschstein NRSA for Individual Predoctoral Fellows, including Underrepresented Racial/Ethnic Groups,Students from Disadvantaged Backgrounds, and Predoctoral Students with Disabilities	4.0	3.7	3.8	3.8
HHS	NIH, NIAID	Science Education Awards	1.1	1.0	-	-
HHS	NIH, NIDA	Science Education Drug Abuse Partnership Award	3.6	0.7	-	-
HHS	NIH, OD	Science Education Partnership Award 5/	15.4	13.8	14.6	14.6
HHS	NIH, NICHD	Short Courses in Population Reseach (Education Programs for Population Research R25)	0.1	0.6	0.6	0.6
HHS	NIH, NIGMS	Short Courses on Mathematical, Statistical, and Computational Tools for Studying Biological Systems	0.5	1.8	1.9	1.9
HHS	NIH, NIEHS	Short Term Educational Experiences for Research (STEER) in the Environmental health Sciences for Undergraduates and High School Students	0.4	0.5	0.5	-
HHS	NIH, NHLBI	Short-Term Research Education Program to Increase Diversity in Health-Related Research	2.9	4.3	4.4	4.4
HHS	NIH, Intramural Training	Student Intramural Research Training Award Program	0.2	5.1	5.3	5.3
HHS	NIH, NHLBI	Summer Institute for Training in Biostatistics	0.1	1.5	1.5	1.5
HHS	NIH, Intramural Training	Undergraduate Scholarship Program for Individuals from Disadvantaged Backgrounds	0.1	2.7	2.8	2.8
Homeland Security	S&T Office of University Programs	Homeland Security STEM Career Development Grant Program	2.7	0.6	-	-
Homeland Security	DNDO	National Nuclear Forensics Expertise Development Program	5.5	6.6	6.0	5.0
Homeland Security	S&T Office of University	Scientific Leadership Awards Program	2.9	3.8	-	-
Interior	Bureau of Land Management	Conservation and Land Management Internship Program	1.6	2.2	1.5	1.5
Interior	USGS	EDMAP	0.6	0.4	0.4	0.4
Interior	National Park Service	George Melendez Wright Climate Change Youth Initiative	0.4	-	-	-
Interior	National Park Service	Geoscientists-in-the-Parks Program	0.3	0.1	0.1	0.1
NASA	ARMD	Aeronautics Academy	0.5	0.5	0.3	-
NASA	ARMD	Aeronautics Content - Smart Skies/Product Content Upgrade	0.8	0.1	-	-

TABLE 2: STEM EDUCATION FUNDING IN MILLIONS BY AGENCY AND PROGRAM, FY 2012-2015

AGENCY	SUB-AGENCY	PROGRAM	2012 Enacted	2013 Actual	2014 Enacted	2015 Budget
NASA	ARMD	Aeronautics Scholarship	1.8	1.3	1.7	-
NASA	Education Office	AESP - Aerospace Education Services Project	3.1	-	-	-
NASA	Science Mission Directorate (SMD)	Aqua	0.3	0.3	0.3	-
NASA	Science Mission Directorate (SMD)	Astrophysics Forum	1.0	1.0	-	-
NASA	Science Mission Directorate (SMD)	Aura	0.3	0.3	0.3	-
NASA	Science Mission Directorate (SMD)	Cassini	0.9	0.9	-	-
NASA	Center JSC	CEP - Career Exploration Project	1.1	0.4	-	-
NASA	Science Mission	Chandra	0.5	0.5	0.8	-
NASA	Center JPL	Curriculum Improvement Partnership Award for the Integration of Research into the Undergraduate Curriculum (CIPAIR)	1.6	-	-	-
NASA	Science Mission Directorate (SMD)	DAWN	0.3	0.3	-	-
NASA	ARMD	Design Competitions	0.1	0.1	-	-
NASA	Science Mission Directorate (SMD)	Earth Science E/PO Forum	0.9	0.9	-	-
NASA	Center MSFC	eEducation Small Projects/Central Operation of Resources for Educators (CORE)	0.7	0.4	-	-
NASA	Center JSC	EFP - Education Flight Projects	2.2	-	-	-
NASA	Science Mission Directorate (SMD)	EPOESS	6.6	6.5	-	-
NASA	ESMD	ESMD Space Grant Project	0.6	-	-	-
NASA	Education Office	GCCE - Global Climate Change Education	3.2	-	-	-
NASA	Science Mission Directorate (SMD)	GLOBE Program	4.5	4.5	6.0	6.0
NASA	Science Mission Directorate (SMD)	GRAIL	0.4	0.2	-	-
NASA	Education Office	GSRP - Graduate Student Researchers Program	2.8	-	-	-
NASA	Science Mission Directorate (SMD)	Heliophysics E/PO Forum	0.7	0.8	-	-
NASA	SOMD	HEOMD-Goldstone Apple Valley Radio Telescope (GAVRT) Project	0.5	-	0.1	0.1

TABLE 2: STEM EDUCATION FUNDING IN MILLIONS BY AGENCY AND PROGRAM, FY 2012-2015

AGENCY	SUB-AGENCY	PROGRAM	2012 Enacted	2013 Actual	2014 Enacted	2015 Budget
NASA	ESMD	HEOMD-NASA's Beginning Engineering, Science and Technology (BEST) Students (NBS)	0.4	0.4	0.4	-
NASA	ESMD	HEOMD-University Student Launch Initiative	0.3	0.5	0.5	0.5
NASA	Science Mission Directorate (SMD)	HST	1.6	1.6	2.0	-
NASA	Education Office	Informal STEM Education	10.0	9.3	-	-
NASA	ARMD	Innovation in Aeronautics Instruction Competition	0.1	-	-	-
NASA	Education Office	Innovation in Higher Education STEM Education	0.5	-	-	-
NASA	Education Office	INSPIRE - Interdisciplinary National Science Program Incorporating Research and Education Experience	0.7	-	-	-
NASA	Education Office	JPFP - Jenkins Pre-Doctoral Fellowship Program	2.6	-	-	-
NASA	Science Mission Directorate (SMD)	Juno	0.6	0.4	-	-
NASA	Center LaRC	LARSS - NASA Langley Aerospace Research Summer Scholars Program	0.6	0.8	-	-
NASA	Science Mission Directorate (SMD)	LDCM	0.6	0.4	-	-
NASA	Education Office	LEARN - Learning Environment and Research Network	3.0	-	-	-
NASA	Center GRC	LERCIP - Lewis Educational Research Collaborative Internship Project (College)	0.1	0.1	0.1	-
NASA	Education Office	LTP - Learning Technologies Project	0.5	-	-	-
NASA	Science Mission Directorate (SMD)	Mars E/PO Formal Ed	1.1	1.1	0.3	-
NASA	Science Mission Directorate (SMD)	Mars E/PO Informal Ed	1.0	1.0	-	-
NASA	Science Mission Directorate (SMD)	MESSENGER	0.3	0.2	-	-
NASA	Education Office	MSP - MUREP Small Projects	1.0	-	-	-
NASA	Education Office	MUREP	-	27.9	30.0	30.0
NASA	Center GRC	MUST - Motivating Undergraduates in Science and Technology	2.3	-	-	-
NASA	Center JSC	NAS - NASA Aerospace Scholars	0.3	0.3	-	-
NASA	Science Mission Directorate (SMD)	NASA Science Mission Directorate STEM Projects 6/	-	-	-	15.0
NASA	Education Office	NES - NASA Explorer Schools	3.8	-	-	-
NASA	Center MSFC	NETS - NASA Education Technologies Services	1.0	1.3	-	-

AGENCY	SUB-AGENCY	PROGRAM	2012 Enacted	2013 Actual	2014 Enacted	2015 Budget
NASA	ESMD	NSBRI Higher Education Activities - National Space Biomedical Research Institute	0.8	-	-	-
NASA	Education Office	NSTI-MI - NASA Science and Technology Institute for Minority Institutions	0.6	-	-	-
NASA	Science Mission Directorate (SMD)	Planetary Science E/PO Forum	0.9	0.9	-	-
NASA	SOMD	Reduced Gravity Student Flight Opportunity Project	0.3	0.4	0.4	-
NASA	Education Office	Research Cluster	1.4	-	-	-
NASA	ESMD	SEED - Systems Engineering Educational Discovery	0.3	0.2	-	-
NASA	Center GRC	SEMAA - Science Engineering Mathematics and Aerospace Academv/FIRST Buckeve	1.0	0.1	-	-
NASA	Science Mission Directorate (SMD)	SOFIA (Stratospheric Observatory for Infrared Astronomy) Education and Public Outreach	0.6	0.7	0.5	-
NASA	Education Office	SOI - Summer of Innovation/NASA IV&V Engineering Apprenticeship Program	5.9	-	-	-
NASA	Education Office	Space Grant - National Space Grant College and Fellowship Program	40.0	37.2	40.0	24.0
NASA	OCT-ST	Space Technology Research Fellowships	12.0	12.0	15.0	15.0
NASA	CMO/ARC	Spaceward Bound	0.4	-	-	-
NASA	Education Office	STEM Education & Accountability Project 7/	-	25.1	28.6	25.9
NASA	Education Office	TCUP - NASA Tribal College and University Project	1.2	-	-	-
NASA	Education Office	URC - University Research Centers	16.0	-	-	-
NASA	Education Office	USRP - Undergraduate Student Research Project	0.3	-	-	-
NRC	Office of the Chief Human Capital Officer	Integrated University Program	15.0	14.2	15.0	-
NRC	Small Business and Civil Rights Office	Minority Serving Institutions Program (MSIP)	0.7	0.8	0.7	0.9
NSF	Directorate for Education and Human Resources	Advanced Informal STEM Learning (AISL), formerly Informal Science Education (ISE)	61.4	48.0	55.0	55.0
NSF	Directorate for Education and Human Resources	Advanced Technological Education (ATE)	64.0	63.5	64.0	64.0
NSF	Directorate for Education and Human Resources	Alliances for Graduate Education and the Professoriate (AGEP)	7.8	7.2	7.8	7.8
NSF	Directorate for Geosciences (GEO)	Centers for Ocean Sciences Education Excellence	4.2	1.0	-	-

TABLE 2: STEM EDUCATION FUNDING IN MILLIONS BY AGENCY AND PROGRAM, FY 2012-2015

AGENCY	SUB-AGENCY	PROGRAM	2012 Enacted	2013 Actual	2014 Enacted	2015 Budget
NSF	Directorate for Education and Human Resources	Climate Change Education (CCE)	10.0	3.4	-	-
NSF	Directorate for Computer & Information Science & Engineering (CISE)	Computing Education for the 21st Century (CE21)	15.0	12.2	-	-
NSF	Directorate for Education and Human Resources	Cybercorps: Scholarship for Service (SFS)	45.0	41.3	45.0	25.0
NSF	Office of Cyberinfrastructure (OCI)	Cyberinfrastructure Training, Education, Advancement, and Mentoring for Our 21st Century Workforce (CI-TEAM)	4.0	-	-	-
NSF	Directorate for Education and Human Resources	Discovery Research K-12 (DR-K12)	99.2	96.7	92.5	102.5
NSF	Office of International & Integrative Activities	East Asia & Pacific Summer Institutes for U.S. Graduate Students (EAPSI)	2.4	1.4	2.4	2.4
NSF	Directorate for Engineering (ENG)	Engineering Education (EE)	11.1	11.0	-	-
NSF	Directorate for Math and Physical Sciences (MPS)	Enhancing the Mathematical Sciences Workforce in the 21st Century (EMSW21)	11.8	10.9	10.0	5.7
NSF	Directorate for Education and Human Resources	Excellence Awards in Science and Engineering (EASE)	5.2	4.7	5.8	5.8
NSF	Directorate for Geosciences (GEO)	Geoscience Education	1.5	0.0	-	-
NSF	Directorate for Geosciences (GEO)	Geoscience Teacher Training (GEO-Teach)	2.0	-	-	-
NSF	Directorate for Geosciences (GEO)	Global Learning and Observations to Benefit the Environment (GLOBE)	1.1	0.8	-	-
NSF	Directorate for Education and Human Resources (EHR) & Office of International and Integrative Activities	Graduate Research Fellowship Program (GRFP)	198.1	243.0	300.0	333.4
NSF	Directorate for Education and Human Resources	Graduate Teaching Fellows in K-12 Education (GK-12)	27.0	25.4	-	-
NSF	Directorate for Education and Human Resources	Historically Black Colleges and Universities Undergraduate Program (HBCU-UP)	31.9	30.3	31.9	31.9
NSF	Directorate for Education and Human Resources	Improving Undergraduate Education	-	-	89.0	118.5

TABLE 2: STEM EDUCATION FUNDING IN MILLIONS BY AGENCY AND PROGRAM, FY 2012-2015

AGENCY	SUB-AGENCY	PROGRAM	2012 Enacted	2013 Actual	2014 Enacted	2015 Budget
NSF	Directorate for Education and Human Resources	Innovative Technology Experiences for Students and Teachers (ITEST)	25.0	31.5	25.0	25.0
NSF	Directorate for Education and Human Resources	Integrative Graduate Education and Research Traineeship (IGERT) Program	59.8	64.0	31.4	20.4
NSF	Office of International & Integrative Activities	International Research Experiences for Students (IRES)	3.2	3.1	2.3	2.3
NSF	Directorate for Education and Human Resources	Louis Stokes Alliances for Minority Participation (LSAMP)	45.6	42.0	45.6	45.6
NSF	Directorate for Education and Human Resources	Math and Science Partnership (MSP)	57.1	52.5	-	-
NSF	Directorate for Engineering (ENG)	Nanotechnology Undergraduate Education in Engineering	1.5	1.7	-	-
NSF	NSF	NSF Research Traineeships (NRT)	-	-	23.7	37.8
NSF	Directorate for Education and Human Resources	NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM)	75.0	84.0	75.0	75.0
NSF	Directorate for Geosciences (GEO)	Opportunities for Enhancing Diversity in the Geosciences	3.6	-	-	-
NSF	Directorate for Engineering (ENG) and Directorate for	Research Experiences for Teachers (RET) in Engineering and Computer Science	5.5	8.6	5.5	5.5
NSF	Directorate for Education and Human Resources	Research Experiences for Undergraduates (REU)	66.0	74.1	75.2	75.1
NSF	Directorate for Education and Human Resources	Research in Disabilities Education (RDE)	6.5	-	-	-
NSF	Directorate for Education and Human Resources (EHR)	Research on Education and Learning (REAL), formerly Research and Evaluation on Education in Science and Engineering (REESE)	37.7	54.6	48.7	-
NSF	Directorate for Education and Human Resources	Research on Gender in Science and Engineering (GSE)	10.5	-	-	-
NSF	Directorate for Education and Human Resources	Robert Noyce Scholarship (Noyce) Program	54.9	51.1	60.9	60.9
NSF	Directorate for Education and Human Resources (EHR)	Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP)	25.3	17.0	-	-

27

AGENCY	SUB-AGENCY	PROGRAM	2012 Enacted	2013 Actual	2014 Enacted	2015 Budget
NSF	Directorate for Education and Human Resources (EHR) and Directorate for Computer & Information	STEM-C Partnerships	-	-	69.1	69.1
NSF	Directorate for Education and Human Resources	Transforming Undergrad Education in STEM (TUES)	39.5	56.4	-	-
NSF	Directorate for Biological Sciences (BIO)	Transforming Undergraduate Biology Education (TUBE)	13.0	3.9	-	-
NSF	Directorate for Education and Human Resources	Tribal Colleges and Universities Program (TCUP)	13.3	12.4	13.5	13.5
NSF	Directorate for Education and Human Resources	Widening Implementation and Demonstration of Evidence-based Reforms (WIDER)	8.0	18.5	-	-
Smithsonian		STEM Informal Education and Instruction	-	-	-	10.0
Transportation	Federal Aviation Administration (FAA)	Air Transportation Centers of Excellence	15.0	13.1	13.0	13.0
Transportation	Office of the Assistant Secretary for Research and Technology	Dwight David Eisenhower Transportation Fellowship Program	1.9	-	-	-
Transportation	Office of the Assistant Secretary for Research and Technology	Garrett A. Morgan Technology and Transportation Education Program	1.1	0.4	0.4	0.4
Transportation	Office of the Assistant Secretary for Research and Technology	National Summer Transportation Institute Program (STI)	2.6	2.8	2.8	2.8
Transportation	Office of the Assistant Secretary for Research and Technology	Summer Transportation Institute Program for Diverse Groups (STIPDG)	1.3	1.3	1.3	1.3
Transportation	Office of the Assistant Secretary for Research and Technology	University Transportation Centers Program	80.0	69.3	68.8	82.0
Total, All Federal STEM Education Programs			**2,888.8**	**2,823.4**	**2,817.5**	**2,919.8**

1/ Awards made in FY 2013 were funded for the full period at the time of award. Prior to FY 2013, continuation costs of awards were funded on a year-to-year basis. In FY 2014, the program will make no new awards, reflected by the zero funding level.

2/ The Office of Science Graduate Fellowship was restructured in FY2013 and succeeded by the Office of Science Graduate Student Research Program.

AGENCY	SUB-AGENCY	PROGRAM	2012 Enacted	2013 Actual	2014 Enacted	2015 Budget

3/ This one-time increase in FY 2014 will be used to fund awards in the area of computational science. FY 2014 awards will be funded for the full period at the time of award. Prior to FY 2014, continuation costs of awards were funded on a year-to-year basis.

4/ Both of these DOE programs are forward-funded. Funding was provided in FY13 to support activities in FY13, FY14, and FY15. Thus, the zeroes reported in FY14 and FY15 do not reflect terminations, but rather that the program is supported in those fiscal years with FY 13 funding.

5/ The NIH Office of Science Education K-12 Program and the Curriculum Supplement Series were merged with the Science Education Partnership Awards (SEPA) in FY 2014.

6/ The Budget provides $15 million to consolidate and streamline programs within the Science Mission Directorate. Previously funded Science Mission Directorate activities, including consolidated programs, may be eligible to compete for this funding.

7/ The Budget provides $26 million to consolidate and streamline programs within the STEM Education and Accountability Projects (SEAP). Projects and activities previously funded by ARMD, HEOMD, or NASA Centers may also be eligible to compete for this funding.