



Science Engagement and STEM Education

Request

We join the larger science engagement and informal science education community—including the Association of Science-Technology Centers (ASTC), the Association of Zoos and Aquariums (AZA), the Association of Children’s Museums (ACM), and the Association of Science Museum Directors (ASMD)—in urging Congress to support public engagement in science and informal science, technology, engineering, and mathematics (STEM) education and research by:

- supporting Federal agency efforts to ensure all Americans have lifelong access to high quality STEM Education, including through the STEM-education and science-engagement programs that will support the implementation of the 5-year Federal STEM Education Strategic Plan by the 13 agencies that form the National Science and Technology Council Committee on STEM Education (CoSTEM);
- maintaining Fiscal Year (FY) 2020 funding for the Advancing Informal STEM Learning (AISL) program at the National Science Foundation (NSF) at \$62.5 million and providing funding for the NSF Directorates for Biological Sciences; Education and Human Resources; Geosciences; and Social, Behavioral and Economic Sciences to support museum research, collections, and programs that are key to lifelong STEM education; and
- fully funding and authorizing museums to participate in informal STEM education and science engagement programs across Federal science mission agencies, specifically at the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA), and the National Institutes of Health (NIH), as well as the Departments of Agriculture, Defense, Education, and Energy.

Introduction

In December 2018, a new five-year Federal STEM Strategic Plan was published by the 13 Federal agencies that make up CoSTEM. The plan outlines top priorities and national goals for STEM education efforts across the U.S. Federal government. The primary aspiration of this strategy reflects a desire to increase diversity, equity, and inclusion in STEM by providing all Americans with lifelong access to high-quality STEM education. Museums already work with a wide range of Federal agencies in advancing these three aspirational goals laid out in the plan:

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



Direct support for STEM research and education is primarily provided through the National Science Foundation, an independent Federal agency responsible for about two-thirds of all Federal funding for biological, geological, and anthropological research at America's universities, science centers and other museums. The mission of NSF's Directorate for Education and Human Resources (EHR) is to achieve excellence in U.S. STEM education at all levels and in all settings (both formal and informal) in order to support the development of both a well-prepared workforce and a well-informed citizenry. EHR's AISL program invests in research and development of innovative and field-advancing, out-of-school STEM learning, and emerging STEM learning environments. The NSF Directorates for Biological Sciences, Education and Human Resources, Geosciences, and Social, Behavioral & Economic Sciences have all supported museums in the areas of field and collections-based research, collections improvements and digitization, database development, and educational programming.

Many other Federal agencies have significant programs to support STEM education and public engagement with scientific research through informal STEM learning, specifically within museums and other cultural institutions. These programs include NASA's Office of STEM Engagement, NOAA's Office of Education, and the NIH's Science Education Partnership Award. In addition, many Federal agencies, such as the U.S. Department of Agriculture (USDA), the U.S. Department of Defense (DOD), other components of the U.S. Department of Health and Human Services (HHS), other components of the U.S. Department of Commerce, and the U.S. Department of Energy (DOE) have programs dedicated to STEM workforce development and public engagement in science that include partnerships with museums and other informal learning organizations.

Talking Points

- Hundreds of millions of Americans of all ages and backgrounds learn about STEM subjects each year by visiting museums, science centers, public gardens, zoos, aquariums, and other cultural institutions.
- Museums partner with and receive funding from a wide variety of Federal agencies to engage the public and educate Americans of all ages—from urban museums to rural nature centers and from programs in K-12 schools to engagement with military installations and Native American reservations.
- Museum exhibitions, educational programs and resources are built on a firm foundation of research, and museum researchers make major original contributions to the understanding of important issues such as changes in climate, environments, biodiversity, and human culture.
- Informal STEM education programs at other Federal agencies are also critical to helping museums attract, inspire, and educate the current and future STEM workforce.
- NASA's Competitive Program for Science Museums, Planetariums, and NASA Visitor Centers (CP4SMPVC) is authorized by law and has helped the agency meet numerous goals identified in its strategic plan—including advancing the nation's STEM education and workforce pipeline. NASA has transitioned many of these activities into a new competitive grant program for museums, the Teams Engaging Affiliated Museums and Informal Institutions (TEAM II) program.



- A number of vital NOAA programs—including the Competitive Education Grant Program and Bay-Watershed Environmental Training (B-WET)—currently help zoos, aquariums, science centers, and other museums to bring real world examples of science to students nationwide.
- NIH’s Science Education Partnership Awards (SEPA) program builds relationships that improve life science literacy nationwide.
- In 2009, the National Research Council of the National Academies released a report entitled *Learning Science in Informal Environments: People, Places and Pursuits*. Findings included:
 - “Do people learn science in non-school settings? This is a critical question for policy makers, practitioners and researchers alike—and the answer is yes.”
 - “Designed spaces—including museums, science centers, zoos, aquariums and environmental centers—can support science learning. Rich with real-world phenomena, these are places where people can pursue and develop science interests, engage in science inquiry, and reflect on their experiences through sense-making conversations.”
 - “Informal environments can have a significant impact on science learning outcomes for individuals from non-dominant groups who are historically underrepresented in science.”

Status

- Funding for NSF, NOAA, and NASA is determined annually in the Commerce, Justice, and Science appropriations bill.
- Funding for NIH is determined in the Labor, Health and Human Services, and Education appropriations bill, which was funded in FY 2019.
- As in the previous two years, the Administration’s FY 2020 budget request proposed eliminating the offices of education at NASA and NOAA.

Informal STEM Programs Funding History (\$ in millions)

	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20 President’s Request
NSF - AISL	\$54.8	\$55	\$62.5	\$62.5	\$62.5	\$62.5	TBD
NASA - CP4SMPVC/TEAM II	\$7.7	\$6.5	\$6.5	TBD	\$10	\$5	elimination
NOAA - Competitive Grants	\$5.6	\$6	\$5	\$5	\$5	\$5	elimination
NOAA - B-WET	\$7.2	\$7.2	\$7.2	\$7.5	\$7.5	\$7.5	elimination
NIH - SEPA	\$18.5	\$18.5	\$18.5	\$18.5	\$19.5	TBD	TBD