



Federal Policy Goals January 2021

The STEM Education Coalition is an alliance of more than 800 education, business, and professional organizations nationwide that works to inform federal, state, and local decision makers about the critical role that science, technology, engineering, and mathematics (STEM) education plays in enabling the American competitiveness in the global economy. Advancing STEM education must be a central element of a broad-based agenda to promote U.S. prosperity and innovation in an increasingly competitive, technology-driven world.

As a Coalition, we share the following broad principles:

- **Equity and Access in the STEM Pipeline:** We must expand the capacity and diversity of the STEM workforce pipeline and prepare more students for the best jobs of the future by working to raise literacy and achievement in the STEM fields for all K-12 students – and beginning in the early grades both inside and outside the classroom. We must also invest in efforts to broaden participation in our higher education STEM ecosystem to build a strong and equitable future. America’s global competitiveness and national security depend on a strong STEM research enterprise and workforce, as well as a STEM literate populace, both of which will be strengthened by broadening participation.
- **STEM Education is Not a Luxury, It is a Necessity:** Unfortunately, during the COVID pandemic, far too many schools have turned away from a strong focus on the STEM subjects as they have struggled to maintain their operations with insufficient federal support. We need to reverse this trend plus invest in training high-quality STEM teachers before a generation of students falls behind in the knowledge and skills they will need to support our recovery, achieve equity, and propel us forward. In addition to increasing federal support for STEM Education, we recommend the federal government provide support for research into developing best practices and resources for distance learning in STEM in K-12 and higher education.
- **STEM Education is Essential to U.S. National Security and Competitiveness:** Excellence in the STEM disciplines is an essential element in maintaining U.S. national security, both so that our country has the necessary domestic talent to fill critical national security positions in both government and industry that require high-level security clearances and to ensure we to secure our future technological leadership and world-class industrial base.
- **A Strong Workforce Focus:** Congress and the Administration must work with business and industry leaders to identify key workforce issues and use federal resources to empower state and local education leaders and their communities with the resources they need to promote STEM as a priority and to drive change. Additionally, the federal government should increase support for high-quality internships, cooperative education, and apprenticeships.

- **Bipartisan and Broad-based:** Policies to promote STEM education as a national priority have been and should remain bipartisan and evidence-based. Such policies will be supported by a strong and united community of stakeholders and advocates in the business, professional, research, and education communities.
- **Robust Inter-Agency Collaboration:** A STEM agenda must embody an “all hands on deck” approach to improving STEM that integrates workforce, K-12, higher-education, career and technical, informal and out-of-school learning, and research elements and effectively leverages resources across the federal government. Many agencies play important roles in STEM education including the Department of Education, National Science Foundation, Department of Defense, and National Aeronautics and Space Administration.

Recommendations to the Biden-Harris Administration for its First 100 Days:

- Ensure that federal plans to address the acute learning losses resulting from COVID specifically address the STEM subjects and provide sufficient supports to state and local school authorities to address deficiencies in STEM learning and teaching and professional development for educators.
- Appoint a STEM coordinator at the White House Office of Science and Technology Policy (OSTP) whose role will be to drive a STEM education, workforce, and jobs agenda across the federal government.
- Reestablish the Office of STEM Education at the Department of Education and ensure it is adequately staffed.
- Ensure that the Federal Committee on STEM Education, charged with interagency coordination, is fully staffed and supported to be effective in its Congressionally mandated functions.
- Appoint qualified STEM education professionals to a wider range of federal advisory bodies, such as the President’s Council of Advisors on Science and Technology and the National Science Board, and in White House and other senior federal agency policymaking positions.
- Make STEM education programs and resources designed by federal agencies (e.g. NASA, DOE, NOAA, DOT, EPA) more accessible and aligned to the Framework for K–12 Science Education and related standards. Additionally, leverage the reach of major Federally Funded Research and Development Centers, such as the National Laboratories.
- The federal government should develop an interagency Strategy on Broadening Participation in Science and Strengthening the U.S. STEM Workforce. It is of particular importance to promote equity in digital skills and online learning environments.
- Reinstate the White House Science/STEM Fair and hold public events that excite the public about STEM and demonstrate to the Nation that STEM is an Administration priority.

STEM Education Budget Priorities

We urge Congress and the Administration to prioritize funding for federal programs that are essential to student success in STEM subjects in the FY2022 budget process:

- We support the successful implementation of the *Every Student Succeeds Act* (ESSA) and its key STEM provisions:
 - *Student Support and Academic Enrichment Grants* (ESSA Title IV.A), which is the major STEM funding source for states and districts under ESSA.
 - *Education Innovation and Research* program (ESSA Title IV.F), which has awarded more than half of its competitive grants in the past year to support STEM-related projects.
 - *Supporting Effective Instruction Grants* (ESSA Title II.A), which funds professional development for STEM educators.
 - *21st Century Community Learning Centers* (ESSA Title IV.B), which funds high-quality STEM programming in afterschool and summer learning programs.
- Include science assessments for federal accountability on par with assessments for Mathematics and English Language Arts when ESSA is reauthorized. Emphasize the value and importance of science education, especially elementary science, both of which have seen a marked decline in classrooms over the last four years as a result of the narrowing of the curriculum caused by No Child Left Behind.
- Ensure that federal STEM programs are regularly and effectively evaluated to measure their impact on student outcomes.
- Congress should invest in the Department of Education's Teacher Quality Partnership program, which helps create model teacher preparation programs to grow the pool of quality new teachers as well as other programs that help train educators.
- Consider restoring federal programs and funding that directly benefit STEM education, such as the Title IIB Math-Science Partnership Program when ESSA is reauthorized
- Establish a pilot program for the rapid recruitment, training, and retention of diverse teachers, faculty, and administrators to leadership positions in STEM instruction.
- We support funding for *The Strengthening Career and Technical Education for the 21st Century Act* (Perkins) which also has a significant STEM focus.
- We support the National Science Foundation's Education and Human Resources (EHR) Directorate. The EHR directorate plays a critical role in expanding the STEM education knowledge base for broadened participation, graduate and undergraduate innovation and fellowships, enabling a skilled technical workforce, informal and afterschool education, and student experiences in STEM careers. NSF additionally funds student STEM training, education research, and community engagement in STEM through its research directorates. We support creating pathways for scaling and implementing NSF-funded education research through better partnerships with the Department of Education. The National Science Foundation also plays a crucial role in helping to develop best practices in STEM teacher preparation.
- We support establishing a more transparent process for expanding or modifying the Department of Homeland Security list of STEM-designated degree programs that would provide a clear pathway for adding emerging and/or proven STEM disciplines to DHS-listed STEM fields for immigration purposes, thus enhancing the pipeline of much-needed STEM students and professionals.

Higher Education Reforms Must Bolster the STEM Talent Pipeline

As Congress deals with comprehensive reauthorization of the Higher Education Act, such legislation must expand the capacity and diversity of the STEM workforce pipeline and provide more Americans with the supports they need to gain access to the best jobs of the future. We must also make sustained investments in preparing new teachers to be skilled in STEM pedagogical content knowledge so that they can generate strong student learning and excite students about pursuing STEM careers. Federal higher education policies must also support new and emerging education pathways into STEM careers beyond the traditional 4-year university experience.

Additionally, we recommend the federal government expand support for and scale up programs that have shown the ability to foster organizational change and empowerment of women and underrepresented/underparticipating minority faculty, such as NSF's INCLUDES and ADVANCE programs. We also support expansion of the NSF and NIH funding supplementals to bring women back into the STEM workforce at all federal agencies.

Competitiveness Legislation Must Include a Strong Focus on STEM Workforce

As Congress considers the reauthorization of the *America COMPETES* Act and its successor legislation to bolster U.S. competitiveness in science and technology by boosting investments in research and development, such proposals should include a strong and broad-based focus on improving the diversity and capacity of the STEM workforce pipeline, especially in new and emerging industries.

Empower the Federal STEM Education Strategic Plan to Succeed

In 2018, the Trump Administration published a 5-year strategic plan, *Charting a Course for Success: America's Strategy for STEM Education*. This plan, which was developed with input from STEM stakeholders, proposed a wide range of policies to improving STEM education, bolster the competitiveness of the American workforce, and expanding opportunities to empower all Americans with the skills to succeed in the modern global economy. The Biden Administration can deliver on the promise of these plans by reflecting STEM education goals in its future agency-by-agency budget proposals and implementation plans and by delivering on its commitments to establish STEM education as core priority at the Department of Education, the National Science Foundation, and throughout the mission agencies. We urge the Biden Administration to seek robust stakeholder input and embrace transparency during development of future iterations of these plans.

Infrastructure Plans Must Include Resources to Support STEM Education

The Administration's plans to improve the nation's infrastructure must address STEM education-related needs, including school laboratories and facilities, broadband access and digital resources to support modern learning, school equipment and instructional materials and logistics and transportation to enable hands-on learning and research infrastructure to support development of the future STEM workforce. See Addendum at the end of this document outlining specific STEM infrastructure priorities.

Addendum - Infrastructure and STEM Education- What Does That Encompass?

Any vision to improve and expand STEM education must encompass an infrastructure strategy that supports the ability for all educators and students to become STEM literate and to enable students to become: capable information technology users; analyzers and evaluators; problem solvers and decision makers; creative and effective users of productivity tools; communicators, collaborators, publishers, and producers; and informed, responsible, and contributing citizens.

Physical Facilities and Improvements

Adequate physical facilities are vital to supporting a successful STEM learning environment. There are several aspects of physical facilities that require investment to develop and maintain effective STEM programming. This includes investing in:

- Classrooms, buildings, school grounds, and libraries, as well as investments for physical facilities to support out of school STEM activities and project-based learning such as science centers and museums, community centers, public libraries, and afterschool facilities.
- Laboratories, including science, computer, and engineering labs;
- Supplies/tools, including microscopes, beakers, calculators, safety tools, and other equipment to support hands-on STEM activities;
- Textbooks, lab manuals, and other materials to support guided STEM activities leveraging tools and physical infrastructure designed for STEM learning.

Technology and Distance Learning

The emergence of technology in education represents a major challenge and opportunity to address the infrastructure needs of a successful STEM learning environment. Aspects of technology that require attention and investment include:

- Developing and utilizing online learning/distance learning technologies to integrate with similar on-campus STEM activities to better assimilate technology and to give opportunities for students to learn in a digital environment, particularly for students in rural areas that lack accessibility to traditional STEM learning opportunities;
- Securing the universal availability of high-speed internet connectivity, both in and out of school, and an internet-based platform to support STEM on-going activities and digital instruction accessible for educators and students;
- Computers, other audio/visual equipment to support technology-based STEM education;
- Curriculum that incorporates an effective technology-based education leveraging the tools and facilities provided through investment.
- Education research platforms that would enable transformational education research and testing of new technologies.

STEM Ecosystems

A robust STEM education infrastructure plan should include a strategic approach to develop an “ecosystem” of additional aspects that contribute to the technology and physical facility needs to ensure a well-rounded, high-quality STEM learning environment. Additional aspects to develop a high-quality STEM ecosystem include:

- Educators and their professional development to support effective STEM education that leverages the physical facilities and tools available and contributes to developing a dynamic STEM curriculum;
- Partnerships (community-based/public-private) for out-of-school activities, hands-on learning, high-quality apprenticeships and cooperative education opportunities, additional equipment and facilities;
- Transportation to support STEM education opportunities out-of-school;
- Other tools and supplies needed to ensure an equitable STEM learning environment for traditionally underserved populations and students with disabilities;
- Support staff, including administrative and information technology to ensure a secure and healthy atmosphere for STEM and digital-based learning.