

STATEWIDE
**Science, Technology, Engineering
and Mathematics (STEM) Education**

Strategic Plan Review

A Summary of Components and Frameworks



Statewide Science Technology Engineering and Mathematics (STEM) Education Strategic Plan Review

A Summary of Components and Frameworks

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A Brief Overview of Purpose

“We want to make sure that we are exciting young people around math and science and technology and computer science. We don’t want our kids just to be consumers of the amazing things that science generates; we want them to be producers as well. And we want to make sure that those who historically have not participated in the sciences as robustly — girls, members of minority groups here in this country — that they are encouraged as well. We’ve got to make sure that we’re training great calculus and biology teachers, and encouraging students to keep up with their physics and chemistry classes.... It means teaching proper research methods and encouraging young people to challenge accepted knowledge.”

President Barack Obama

National Academy of Sciences

April 2013

This review is intended to serve as a tool for the progress of the Oregon STEM Education Strategic Planning Committee and for other states undergoing a similar process. This review focuses on the Statewide STEM Education Strategic Plans that have already been successfully implemented in the 17 following states: Colorado, Federal, Florida, Idaho, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Nevada, New York, North Carolina, Oregon, Tennessee, Washington DC, and Washington State. For the sake of consistency in this review, the Federal STEM Education Strategic Plan will be treated as a state.

The following sections will report on specific categories which have been thematic throughout the whole of the Strategic Plans written in the states above. Each section breaks down popular objectives and/or action items for successful implementation of the goal.

Summary of Findings

Structure

Each plan has a structure that varies in length, size, and shape but contains three critical components:

1. In-depth explanation on the importance of STEM education with hard specific evidence on how it relates to their state.
2. A concrete set of goals or a vision statement.
3. Strategies aligned with those goals.

The goals show similar themes, generally aligning to the Federal STEM Education Strategic Plan, but vary greatly in terms of state's needs and priorities.

Objectives or Theories for Change

The objective for the Federal STEM Education Strategic Plan imagines, “a future where: the US has a well-qualified and increasingly diverse STEM workforce able to lead innovation in STEM-related industries and to fulfill CoSTEM agency workforce needs, students having access to excellent P-12, postsecondary, and informal STEM education and learning opportunities, and Federal STEM education programs based on evidence and coordinated for maximum impact in priority areas” (National Science and Technology Council, 2013).

The objectives of the other states analyzed shared some similar priorities:

1. Ten states¹ recommend students have access to excellent P-12, postsecondary, and informal learning opportunities.
2. Ten states² recommend community and student understanding of the importance of a STEM knowledge-based economy.
3. Six states³ recommend improving equity by closing the achievement gap.

The STEM Plan for Washington DC states, “To achieve breakthrough results in the preparation of all DC students to be fluent in STEM subjects and to engage and prepare a significantly larger and more broadly representative population of students for STEM professional careers requires a commitment to a cohesive, whole-system transformation” (OSSE, 2014). Though this seemed to be an underlying theme within the objectives, DC recognizes that in order to make change in STEM education, the entire system needs to be on board for a transformation.

¹ Colorado, Federal, Maine, Massachusetts, Michigan, Nevada, New York, Oregon, Tennessee, Washington

² Colorado, Iowa, Maine, Minnesota, Nevada, New York, North Carolina, Oregon, Tennessee, Washington

³ Florida, Iowa, Maine, Massachusetts, Minnesota, Washington

Goals

Within the 17 Strategic STEM Education Plans surveyed, several common themes were found within the goals. Chart 1.0 and Table 1.0 summarizes the states that shared similar themes. For each state's complete list of goals, see Table 1.1 in the Appendix.

Chart 1.0: Themes within Goals

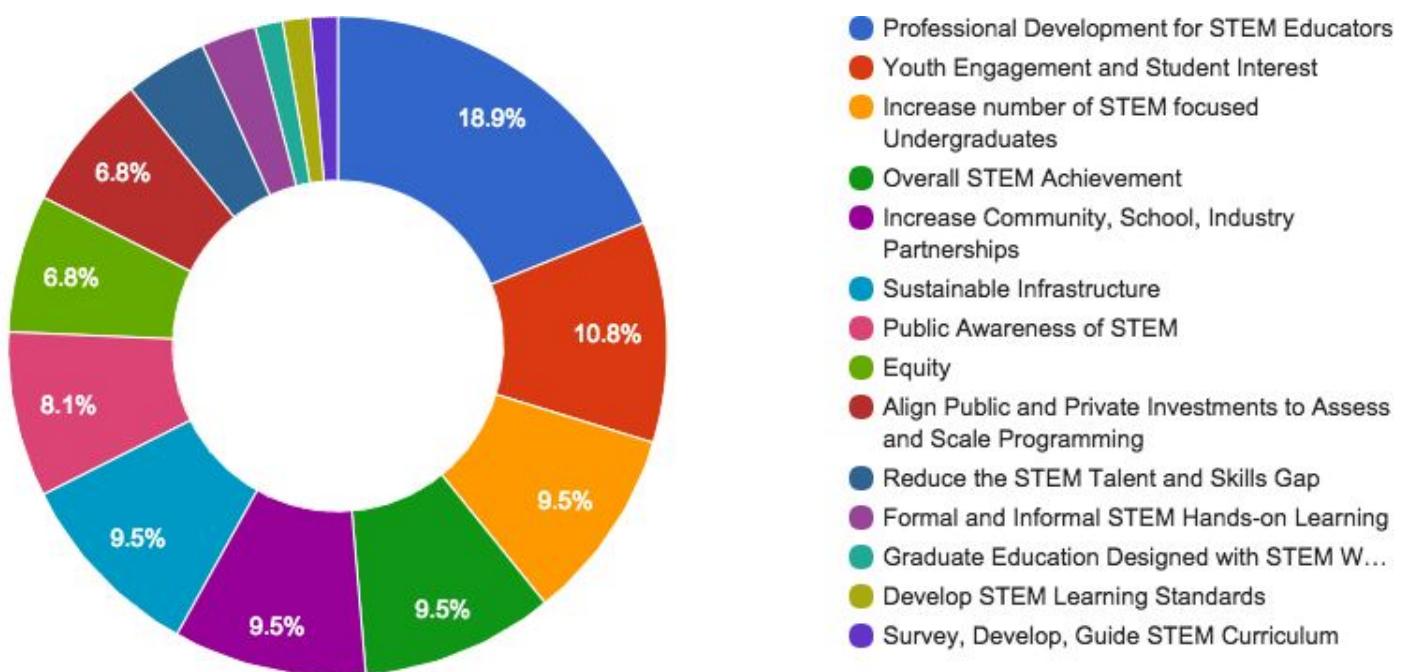


Table 1.0: Themes within Goals

Goal	Total	List of States
Professional Development for STEM Educators	14	Federal, Florida, Idaho, Iowa, Maryland, Massachusetts, Michigan, Minnesota, Nevada, New York, North Carolina, Oregon, Tennessee, Washington State
Youth Engagement and Student Interest	8	Colorado, Federal, Iowa, Massachusetts, Nevada, North Carolina, Tennessee, Washington State
Increase number of STEM focused Undergraduates	7	Federal, Iowa, Maine, Massachusetts, North Carolina, Washington DC, Washington State
Overall STEM Achievement	7	Florida, Iowa, Maine, Massachusetts, North Carolina, Oregon, Washington DC
Increase Community, School, Industry Partnerships	7	Iowa, Maryland, Michigan, Minnesota, Nevada, New York, North Carolina
Sustainable Infrastructure	7	Colorado, Florida, Maryland, Minnesota, Nevada, New York, Oregon

Public Awareness of STEM	6	Idaho, Iowa, Minnesota, Nevada, Tennessee, Washington State
Equity	5	Federal, Idaho, Maryland, Oregon, Washington State
Align Public and Private Investments to Assess and Scale Programming	5	Maine, Michigan, Minnesota, New York, North Carolina
Reduce the STEM Talent and Skills Gap	3	Colorado, Idaho, Tennessee
Formal and Informal STEM Hands-on Learning	2	Iowa, Maryland,
Graduate Education Designed with STEM Workforce in Mind	1	Federal
Develop STEM Learning Standards	1	New York
Survey, Develop, Guide STEM Curriculum	1	New York

Strategies

The structure of the majority of the Strategic Plans surveyed include strategies to help implement their goals.

Each table below is dedicated to a specific goal listed in Table 1.0 above and lists the state's strategy (if available) for implementation.

Table 2.1: Professional Development for STEM Educators

State	Strategy
Federal	<ul style="list-style-type: none"> • Identify/develop/test/support effective teacher preparation efforts that encourage teachers use of evidence-based STEM practices • Increase the number and quality of authentic STEM experiences for pre and in-service P-12 teachers participating in federally supported internship, fellowship, scholarship programs
Florida	<ul style="list-style-type: none"> • Identify or create scalable programs that show evidence of positively impacting educator learning, practice, and student achievement • Increase the number of high-quality STEM research experiences for educators • Engage educators in job-embedded professional learning communities • Require staff and STEM educators to participate in high-quality professional development • Secure funding for the dissemination of high-quality educator development programs • Streamline the process to remove ineffective educators • Continue to research effectiveness of performance pay for educators • Create incentives for the hiring and retention of experienced, effective mathematics and science teachers in low-performing schools that often serve a high proportion of minority and low-income students • Provide cultural competency training to PK-20 educators • Work with teacher preparation programs in Florida's colleges and universities to implement the supporting action items related to undergraduate programs
Idaho	n/a
Iowa	<ul style="list-style-type: none"> • Professional development over the skills, concepts and teaching strategies of the Iowa Core

	<p>should be delivered to community college and university-level teacher preparers, content instructors, field experience supervisors, classroom hosts, mentors and administrators</p> <ul style="list-style-type: none"> • Similar to model classrooms for K-12 professional development, exemplary pre-service methodology instruction and curriculum in STEM should be disseminated to all Iowa teacher preparatory institutions • Scale up existing programs that provide early field experiences to prospective mathematics, science and technology teachers • Strengthen and expand existing mathematics, science and technology teacher recruitment programs within and across teacher preparatory institutions including community colleges and high schools • Expand support for existing non-traditional licensure pathways for practicing or retired STEM professionals • Require that any professional development for mathematics and science teachers follow the Iowa Professional Development Model • Unite the assets of the universities, AEAs, community colleges, Iowa Department of Education and other qualified entities in coordinating professional development for STEM teachers • Deliver STEM K-12 and postsecondary training to improve the recruitment and retention of underrepresented minorities in teaching • Target STEM professionals/retirees from business and industry to consider a second career as a STEM educator
Maryland	<ul style="list-style-type: none"> • Increase capacity of all educators to implement high-quality integrated STEM instruction • Increase collaboration among all potential educational partners
Massachusetts	<ul style="list-style-type: none"> • Tailor and align professional development opportunities • Connect pre-service teachers to STEM • Design innovative professional development programs for educators to promote educator growth
Michigan	n/a
Minnesota	<ul style="list-style-type: none"> • Creating a calendar on the Minnesota STEM Network website that allows networked partners to upload professional development opportunities statewide • Working with Minnesota Department of Education to create a link on their website linking teachers with opportunities statewide • Working with Network partners to increase availability of professional development activities to outstate teachers using a variety of delivery methods • Providing support for statewide organizations to create and sustain STEM-specific professional development conferences and activities • Communicating to administrators the availability and importance of STEM professional development
Nevada	<ul style="list-style-type: none"> • Continue and finalize committee work on guidelines for exemplary teacher professional development and gain consensus from STEM Coalition members • Continue and finalize committee work on guidelines for exemplary, research-based classroom STEM practices in inquiry, problem-based learning, and real world applications • Develop a recognition system for exemplary practices and advertise these statewide
New York	<ul style="list-style-type: none"> • Establish networks of stakeholders in STEM education to provide professional development that enhances the development, dissemination, and implementation of curriculum, instructional and assessment materials, and other resources • Engage local, state, and national professional and science education associations to lead and sustain STEM-related professional development opportunities for face-to-face and online collaboration • Build the capacity of interested business and industry experts to effectively partner with local educational agencies by promoting pertinent professional learning opportunities and resources.

	<ul style="list-style-type: none"> • Target funding opportunities that support partnerships between business and industry, institutes of higher education, professional and science education associations, local education agencies, and other stakeholders to sustain professional development for teachers and leaders in science • Promote institutes, courses, and/or workshops that enhance the teaching and learning of the individual disciplines associated with science, technology, engineering, and mathematics and the connections between these disciplines • Create access to new and/or existing, online, on-demand venues for specific and focused professional development • Design opportunities to coordinate professional development that articulates collaborations and partnerships across P-16 • Target annual professional development in science that builds specific subject knowledge and pedagogical-content knowledge toward fulfilling the 175 hours required for maintenance of certification • Provide funding opportunities for teachers and leaders to participate in sustained, online or on-site professional development institutes, professional learning communities, courses, and/or workshops during the school year • Incorporate career-ladder incentives for teachers and leaders to provide professional development sessions and engage in professional development opportunities that are related to STEM education • Identify or develop and implement a needs assessment to determine the focus of future professional development opportunities • Create professional development opportunities that bring teachers and leaders into contact with working scientists, mathematicians, and engineers through internships and mentorships with peer teachers, institutes of higher education, and/or business and industry partners • Build teacher resources by establishing community-based programs that provide relevant STEM applications in science curriculum and instructional programs • Create or access professional development opportunities that focus on the integration of science and engineering practices in STEM courses • Articulate collaborations and partnerships between STEM stakeholders that support curriculum programming and instructional practices that are better aligned to college and career expectations • Establish partnership programs between local education agencies and institutes of higher education to foster innovative comprehensive approaches that enhance pre-service and in-service teaching and learning of science and engineering practices
North Carolina	<ul style="list-style-type: none"> • Advance professional development for pre-service and in-service educators aligned with the integrated pedagogy and project-based learning methods of STEM teaching and learning • Identify high-quality tools and supports - such as rubrics or self-assessments - to enable schools, programs and businesses to advance consistent understanding and application of the adopted STEM attributes • Identify and convene leading programs, partners and schools to advance and highlight best practices to every county
Oregon	<ul style="list-style-type: none"> • Create opportunities for STEM educators to experience STEM in industry and research as part of their professional development • Build, strengthen and support statewide partnerships for STEM education through our STEM hubs • Provide incentives to teacher preparation programs to develop, evaluate, and disseminate effective STEM preservice teaching strategies including continued support during the first three years of teaching • Increase career transitions of STEM professionals into teaching for CTE, math, and science • Provide time and resources for educator-to-educator and educator-industry collaborations around implementation of promising STEM instructional practices and materials
Tennessee	<ul style="list-style-type: none"> • Increase effective STEM teachers and leaders

	<ul style="list-style-type: none"> • Replicate proven STEM teacher training programs • Use STEM schools as learning labs • Boost STEM teacher supply • Enhance STEM teacher capacity and reach • Increase quality STEM professional development • Support school leaders
Washington State	<ul style="list-style-type: none"> • Early learning through high school educators: evidence-based professional learning for teachers and leaders • Awareness and development of STEM programs and practices to increase offerings of STEM education • Development of quality in-and out-of-school STEM curricula • Policy action to improve teacher pay, professional training, incentives for teachers to teach at high-needs schools

Table 2.2: Youth Engagement and Student Interest

State	Strategy
Colorado	<ul style="list-style-type: none"> • Make STEM in the early grades a Colorado priority • Align STEM efforts to the development of competencies important in an innovation economy • Support STEM-ready educators and learning environments • Make access to STEM resources in rural Colorado a priority
Federal	<ul style="list-style-type: none"> • Federal investments in engagement that draw on the scientific, technological, and engineering assets of Federal Gov't to provide experiences • Federal engagement investments that support integration of STEM into existing school readiness and after-school programs with significant local, regional, and national outreach • Federal engagement investments contributing to improving understanding of how engagement in STEM activities relates to improved student learning/interest
Iowa	<ul style="list-style-type: none"> • Expand STEM education innovations statewide to priority regions of the state such as high population diversity centers and low socioeconomic and rural regions, using successful schools and programs as models • Build a statewide ultra-highspeed internet infrastructure for access at low or no cost to all Iowans. • Improve upon the inventories that have begun through existing initiatives to make accessible and frequently updated records of programs and resources • Build on and advertise existing communication networks for STEM education stakeholders across Iowa • Create a communication portal for Iowa's teachers to access STEM programs, activities, professional development and business partnerships with clubs, industries, colleges and universities • Establish a long-term, steady, reliable, consistent funding stream for building interest and performance in STEM education for Iowa learners Pre-K through 20, insulated from annual budget vagaries • Build on the marketing plans of existing initiatives to promote mathematics, science and technology professions, including teaching as valued and important.
Massachusetts	<ul style="list-style-type: none"> • Early exposure • Don't keep it a secret • Facilitate exploration • Facilitate access
Nevada	<ul style="list-style-type: none"> • Develop a virtual library "big picture" of available informal STEM resources on the nvstem.org

	<p>website for release in 2014</p> <ul style="list-style-type: none"> • Complete database of specific informal resources searchable by teachers, students, parents, and other community members • Develop and implement an In-service course for teachers: A one credit, online class on finding available statewide informal STEM education resources and generating ideas for their classroom use (In year 2, develop a second one-credit online class on developing one or more classroom activities using informal STEM education resources which are then shared with other educators.)
North Carolina	<ul style="list-style-type: none"> • Provide a one-stop action-oriented web-based resource for students, teachers, parents, and businesses to access and get involved in STEM learning • Adopt a set of attributes for STEM schools and programs, aligned with 21st Century Skills, to assist public and private organizations to align, coordinate and advance STEM skills for all students
Tennessee	<ul style="list-style-type: none"> • Establish regional STEM innovation hubs • Launch STEM Platform Schools • Ensure all students have access to rigorous STEM courses • Identify, develop, and share STEM curriculum tools
Washington State	<ul style="list-style-type: none"> • Early learning through high school students: high impact STEM school programs and practices, high-impact STEM programs and practices out-of-school, STEM awareness campaigns, policy action to remove barriers and incentivize the support for and adoption of policies

Table 2.3: Increase Number of STEM Focused Undergraduates

State	Strategy
Federal	<ul style="list-style-type: none"> • Identify and broaden implementation of evidence-based instructional practices, innovations to improve learning, and retention in STEM • Improve support of STEM education at 2-year colleges by creating bridges between 2-4 year institutions • Support/incentivize development of university-industry partnerships • Address high failure rates in introductory math courses at undergraduate level to open pathways to more advanced STEM courses
Iowa	<ul style="list-style-type: none"> • To create more STEM jobs, expand entrepreneurial incentive programs to grow current and start-up STEM companies in Iowa and monitor their needs for proactive climate management. • Equip parents and teachers with STEM-related Iowa-specific career information for creating awareness and interest among children and students • Periodically measure the attitudes and career interests of secondary and collegiate STEM learners • Expand opportunities for STEM teachers to learn more about the work world of Iowa so that they incorporate relevant lessons and news of careers to their students • Develop “Transition Guides” for use by counselors and instructors of STEM subjects at the transition points in a student’s course of study (i.e., middle school to high school, senior year of high school to freshman year of college or transfer student at the two-year point of post-secondary education) • College and university STEM professionals should regularly review curriculum and programs to ensure alignment with workforce and societal needs • Expand programs (such as mentoring, learning communities, early academic interventions, scholarships, role model programs, etc.) with demonstrated success recruiting and retaining students in STEM. Special emphasis should be placed on programs addressing students under-represented in STEM (e.g. women, ethnic/ racial minorities, students with disabilities, etc.).

	<ul style="list-style-type: none"> • Build and maintain an Iowa career- focused website that connects mentors to classrooms and STEM job seekers to employers • STEM enrollments and degrees at all Iowa community colleges, private colleges and public universities should be collected and reported annually
Maine	<ul style="list-style-type: none"> • Improve student awareness of and participation in STEM-related pathways • Increase after-school programming that supports STEM learning • Increase internship opportunities that provide awareness of STEM opportunities
Massachusetts	<ul style="list-style-type: none"> • Align secondary to postsecondary pathways • Promote best practices that target student engagement and relevancy of content
North Carolina	n/a
Washington DC	<ul style="list-style-type: none"> • Establish and support STEM Career Tech Education (CTE) programs of study aligned with the District's most promising occupations • Establish and implement rigorous standards of program quality for STEM CTE pathways • Engage the business and community to strengthen STEM CTE program curricula and partnerships to support classroom instruction • Re-engage the District's disconnected youth through STEM-CTE programs that can prepare them for successful careers • Expand access to and streamline STEM resources
Washington State	<ul style="list-style-type: none"> • Post-secondary, workforce training, and employers: mathematics and science content and pedagogy in post-secondary schools of education, awareness of STEM careers and majors to increase demand in post-secondary workforce training programs (among learners), remediation programs, awareness and coordination of STEM and partnerships between employers, post-secondary institutions, and workforce training programs, policy action to leverage high-impact strategies

Table 2.4: Overall STEM Achievement

State	Strategy
Florida	<ul style="list-style-type: none"> • Sequence curriculum to promote maximum learning • Improve assessments to encourage proficiency in applying STEM skills and content knowledge • Provide teachers with effective STEM curricula and resources • Integrate technology and engineering content standards into state standards at all grade levels • Create technology and engineering course requirements for middle grades • Increase number of career academies in Florida that are STEM focused • Disseminate information and resources to parents about how to support their children's STEM education and choice of STEM careers • Increase awareness of and access to financial aid for postsecondary degrees and certification, particularly in STEM majors • Utilize workforce development systems and industry representatives to familiarize students with careers
Iowa	<ul style="list-style-type: none"> • Professional development in STEM education should be offered to administrators, school board members and community leaders so that they can be more supportive of the content and process skills and teaching strategies detailed in the Iowa Core • Professional development focused on creating a classroom environment and pedagogy that support success in STEM courses by under- represented populations is needed. • Model STEM classrooms should be used for demonstrating effective teaching practices to teachers and leaders

	<ul style="list-style-type: none"> • Iowa's AEAs each should be comparably equipped to deliver exemplary material, curriculum and professional development for STEM teaching and learning • Pre-K, elementary and secondary teacher preparation and the school curriculum should feature active STEM inquiry and problem solving • State K-20 education leaders—including the Iowa Department of Education, the associations of school administrators and school board members, the state's education unions, the Board of Regents and other influential groups—should advocate for STEM emphasis in school and for time necessary within the school schedule for teachers to plan STEM lessons • Distance education models should be scaled up to help remedy the inconsistent course availability problem for Iowa's hundreds of districts • The integration of engineering concepts in P-12 STEM education requires the modification of STEM teacher preparation and practitioner professional development. A comprehensive plan for P-12 engineering education should be commissioned • Colleges and universities should be sufficiently resourced to attract and retain excellent STEM students and faculty
Maine	<ul style="list-style-type: none"> • Increase in-service teacher content knowledge, pedagogical knowledge, and pedagogical content knowledge in science, technology, engineering and mathematics • Increase teacher leadership in science, technology, engineering and mathematics • Increase pre-service teacher programming and recruitment • Continue to adopt rigorous core standards • Encourage innovative instructional practices to increase student achievement
Massachusetts	<ul style="list-style-type: none"> • Couple STEM with content related to citizenship and MA's innovation to economy • Use research-based instructional methods, practices, and curricula • Align learning with career based skills
North Carolina	<ul style="list-style-type: none"> • Adopt a set of attributes for STEM schools and programs, aligned with 21st Century Skills, to assist public and private organizations to align, coordinate and advance STEM skills for all students • Identify a set of measurable indicators along the education-to-workforce continuum to guide the current and future implementation of the STEM Strategic Plan • Implement a designation for STEM Schools and Programs, aligned with the STEM Attributes, to drive the goals and measures outlined within this STEM Strategic Plan
Oregon	<ul style="list-style-type: none"> • Promote the development of new teaching approaches that challenges students to be creative, resourceful, persistent, and collaborative in developing knowledge and skills to solve real-world problem • Increase the interactions of students with STEM professionals who can help students develop aspirations and personal identities as life-long learners and inspired innovators utilizing STEM skills • Develop new opportunities for students to enhance their critical thinking and problem-solving skills in afterschool or summer programs that are focused on solving complex challenges • Increase the availability of early college credits in STEM courses by strengthening local partnerships and articulation agreements between high schools, community colleges and 4-year institutions • Increase the development and acceptance of industry-recognized credentials based on demonstrated skills, including traditional and nontraditional certifications (e.g., micro-credentials, digital portfolios, etc.) • Provide program "start-up" or retooling funds to incentivize post-secondary programs aligned to high-wage, high-demand industry needs • Increase student interest, understanding, and success in mathematics through solving real-world problems • Improve the quality and relevance of post-secondary mathematics placement processes and

	<p align="center">align course offerings to relevant degree/certificate program needs</p> <ul style="list-style-type: none"> • Transform P-20 STEM teaching and learning by supporting the spread of effective approaches and connecting research to practice
Washington DC	<ul style="list-style-type: none"> • Identify and evaluate existing STEM teacher certification pathways • Establish community-based partnerships to support STEM learning • Facilitate STEM career exploration from PK through postsecondary study • Provide access to high-quality STEM curricula aligned to college- and career ready standards accessible via Out of School Time STEM learning experiences • Support implementation of evidence-based practices STEM teacher effectiveness • Increase proficiency in math and science • Expand access to high-quality STEM professional development • Cultivate a thriving professional learning community • Ensure full and ready access to college and career standards and assessment across PK-12

Table 2.5: Increase Community, School, and Industry Partnerships

State	Strategy
Iowa	<ul style="list-style-type: none"> • School leaders, from state level to individual schools, should create incentives for teachers to build partnerships—e.g., create space in the workday for teachers who want to reach out to the private sector • School leaders should devote professional development time to activities in partnerships. Reporting on such activities should be implemented • Expand existing programs that catalyze school- business partnerships by coaching teachers and school leaders on ways and means for creating partnerships with local businesses while interfacing with regional business organizations such as Chambers of Commerce to help business connect to schools • School days and calendars should be modified to embrace rather than discourage STEM programming with business—for example, class period lengths that permit outings, flexible scheduling that allows for assemblies around business matters, time built in for job- shadowing, opportunities for business leaders to teach classes, the integration of subjects such as chemistry and economics to model real-world experience, etc • State policies that interfere with school- business partnerships at all levels should be modified—e.g., how courses count, the value of internships on credentials, the value of business contributions to education • Business trade groups and economic development agencies need to aid the scale up of successful partnerships through campaigns targeting business owners and the guidance of the development of STEM education strategic plans on the part of businesses • Expand existing databases of school-business partnerships within Iowa (and beyond). • Canvass the business sector of Iowa annually for tallied investments in STEM education partnerships and include such information in an annual report
Maryland	<ul style="list-style-type: none"> • Encourage the recognition that STEM education is part of everyone's life and that STEM proficiency is important and attainable • Develop a consistent and clear message to support a culture of inclusiveness in which all are STEM proficient • STEM education messages will be part of both traditional and new media to ensure that all stakeholders have equitable access and opportunities • Raise the understanding that STEM skills are a gateway to entering the workforce and that STEM can foster and promote unified communities through common goals and problem solving
Michigan	n/a

Minnesota	<ul style="list-style-type: none"> • Engaging in conversations with Minnesota Council on Foundations (MCF) in partnership with one or two of its members to explore opportunities to create and sustain a STEM Funders Coalition in Minnesota • Working with MCF's current member networks (e.g., the Education Funders Network and the Workforce Development Funders Network) to gain visibility for the Minnesota STEM Network and regional STEM initiatives • Create an advisory board of corporate CEOs and community foundations leaders across the state for the Network. • Work with funders to develop and continually update a common set of goals and evaluation metrics for STEM learning
Nevada	<ul style="list-style-type: none"> • Continue to recruit new STEM Coalition members through personal contacts; newsletter; and presentations to community groups, districts, schools, and informal STEM education organizations • Collaborate with STEM leaders to increase support for statewide alignment of curriculum and resources to implement the curriculum
New York	<ul style="list-style-type: none"> • Support collaborations with regional STEM hubs that provide access to various higher education faculty and business and industry experts and their facilities to raise awareness of real-world applications and opportunities in STEM college and career pathways • Engage key STEM stakeholders to serve as catalysts in the advancement and implementation process pertaining to NYS science education to build and sustain a STEM talent pipeline • Utilize informal (i.e., museums, nature centers, community organizations, etc.) and formal (i.e., P-12 schools, institutes of higher education, business and industry, research centers) STEM education stakeholders and their resources to promote and support new and existing innovative science education initiatives (i.e., fellowships, internships, mentorships, research opportunities) • Identify models of effective collaborations between departments of science, technology, engineering, and mathematics and teacher education programs of institutes of higher education • Provide incentives for institutes of higher education to facilitate collaborations between departments of science, technology, engineering, and mathematics and teacher education programs of institutes of higher education • Develop and implement career ladder incentives for teachers and administrators that build the leadership capacity and talent pool of STEM departments of school districts and in institutes of higher education • Solicit input from STEM education stakeholders, ensuring the involvement of experts from P-12 education, institutes of higher education, and business and industry in the advisement and recommendations for regulations addressing qualifications to teach science P-12 • Convene science education stakeholders to re-examine the alignment of teacher certification P-12 to the structure of the new P- 12 NYS science learning standards, the Framework for K-12 Science Education, and the NGSS • Re-examine pre-service program requirements to include multiple paths to acquire endorsements of specialization in science education P-12 • Re-examine the current in-service professional development requirement (175 hours over 5 years) to recommend a minimum allocation of time toward teacher participation in science pedagogical content knowledge-based PD and the distribution of these hours over time • Review commissioner's regulations pertaining to science program and diploma requirements P-12 and consider amendments to reflect the knowledge and skills as consumers of scientific and technological information related to their everyday lives and enabling them to enter the colleges and/or careers of their choice • Ensure internal collaboration and consultation between various program offices within the NYSED to propose the requisite changes in regulations • Explore funding opportunities offered by both public and private sectors to establish STEM stakeholder partnerships that are focused on enhancing programs in STEM education by embracing models that are similar to those used in the National Board Certification process

	<ul style="list-style-type: none"> • Re-evaluate the coordination, allocation, and distribution of state and federal funding streams to better support science education • Identify available grants to sustain the implementation of the new P- 12 NYS science learning standards through partnerships within the State's established infrastructure, such as BOCES, museums, STEM Hubs, etc • Develop a statewide plan for improving communication with science stakeholders and the community at large about the benefits of STEM education • Develop a plan to build awareness regarding the importance of science education for citizenry and readiness for college and/or careers • Build support and enhance knowledge of the public and private sectors to promote effective implementation of science curriculum programming, instructional practices, and standards-based assessments that are aligned to the new P-12 NYS science learning standards
North Carolina	<ul style="list-style-type: none"> • Coordinate a public awareness campaign to 100 counties utilizing public/private partnerships, to inspire and engage North Carolina citizens in this economic challenge • Identify and convene leading programs, partners and schools to advance and highlight best practices to every county • Provide a one-stop action-oriented web-based resource for students, teachers, parents, and businesses to access and get involved in STEM learning

Table 2.6: Sustainable Infrastructure

State	Strategy
Colorado	<ul style="list-style-type: none"> • Build a coalition of support • Define STEM • Identify and map existing and effective STEM efforts • Measure progress • Embed a system of continuous improvement
Florida	<ul style="list-style-type: none"> • Develop and maintain collaborative relationships with regional STEM councils • Communicate with regional councils to identify short and long-term local industry workforce training/certification needs • Oversee, track, and report progress on implementing the Florida STEM strategic plan • Identify and disseminate best practices and resources from successful STEM initiatives • Identify funding sources to support STEM initiatives statewide • Create sub-panel to review approaches for STEM integration into the Next Generation Sunshine State Standards/ Common Core State Standards
Maryland	<ul style="list-style-type: none"> • STEM stakeholders are empowered to make informed decisions about resource selection and development and apply consistent criteria to evaluate STEM resources • STEM stakeholders have increased access to high-quality STEM resources. Resources are leveraged to promote and accelerate the growth of STEM education across the state
Minnesota	<ul style="list-style-type: none"> • Creating a RFP process to engage interested organizations in planning or further developing a hub in their region • Creating a website to house relevant, unbiased STEM research tailored to specific audiences, including legislators, educators, business leaders, parents, students, and the broader community. • Continuing to inform leaders across sectors using a variety of delivery methods, including but not limited to annual meetings, regional summits, social media, and professional development activities • Continually updating the Network website and research library • Creating an “ask the expert” or “speakers bureau” link on the Network website for policymakers and other external audiences

Nevada	<ul style="list-style-type: none"> • Create a STEM Experts Advisory Committee and recruit STEM professionals to serve as education mentors, speakers, content advisors • Set up and market a website matchmaking system for teachers and community volunteers, STEM experts, outreach programs, etc • Contact database of STEM coordinators and leaders willing to serve as resources to colleagues • Expand website resources such as grant opportunities, links to other NV websites, national STEM websites, curriculum, grant writing webinars for teachers, guidelines and examples of exemplary STEM professional development and classroom practice • Communications plan that provides opportunities for educators to share programs and collaborate on projects and funding opportunities • Teacher, parent and student resources for career information, community events, informal STEM programs and competitions • Parents will be directed to homework help resources. We will ask districts and schools to provide a link to the Coalition website to funnel parents to the resources they need –thereby allowing them to become curious and become familiar with STEM
New York	<ul style="list-style-type: none"> • Seek funding opportunities to acquire equipment, materials, and supplies to support the development, implementation, and sustainability of P-12 science curriculum and instructional programming at the local and regional levels • Identify new or use existing funding streams to support facilities planning to provide physical space that is conducive to teaching and learning in state-of-the-art classrooms and laboratories • Develop collaborations and partnerships to promote and support comprehensive systems for the development, implementation, and sustainability of science materials and resources • Seek funding opportunities for instructional technologies that support core science and engineering content, conceptual understandings, and practices • Develop partnerships between STEM stakeholders and school districts that collaborate to provide education outreach for science materials and other logistical support • Provide mentorships and research opportunities for teachers and students through incentives to build partnerships between business and industry, higher education institutions, and/or other STEM stakeholders (i.e., museums, nature centers, community organizations, etc.) • Provide incentives for outreach opportunities and technical support for laboratory experiences and rentals of high-tech research equipment • Capitalize on the regional and local capacity to offer distance learning and online courses through partnerships and grants • Investigate opportunities to expand access to science content through online resources
Oregon	<ul style="list-style-type: none"> • Build public awareness and demand for improved STEM outcomes and programs. • Develop a sustainable funding and policy environment for STEM and CTE. • Create and support an implementation network of Regional STEM Hubs to increase adoption and spread of effective practices, leverage resources, and provide critical feedback to inform policies and investments. • Produce promotional materials that connect STEM learning opportunities to high demand industry sectors, and which convey the exciting career and research opportunities that exist amongst Oregon businesses, organizations, and institutions. • Publicly showcase individuals, classrooms, and organizations that are effective in achieving positive STEM outcomes. • Create and implement a community engagement campaign to increase STEM interest and access amongst traditionally underrepresented populations.

Table 2.7: Public Awareness of STEM

State	Strategy
Idaho	n/a
Iowa	<ul style="list-style-type: none">• Build on messaging campaigns of existing initiatives that alert students, parents, the public, policy makers, employers and all citizens that STEM is an essential tool for our state• Build on existing STEM networks and organizations representing education, government and industry to create a singular voice on policy and practice• Economic developers and government leaders of Iowa should aggressively advocate for P-20 STEM education in recognition of the foundation it provides to workforce and productivity challenges• Create and scale up successful STEM programming that links business and school• Increase involvement of students underrepresented in STEM (i.e. women, ethnic/racial minority students, students with disabilities, etc.) in STEM enrichment programs• Build a registry of experts/skills for matching needs with assets in STEM across Iowa
Minnesota	<ul style="list-style-type: none">• Convene STEM education practitioners in formal education, informal education, government and industry to create a common definition of and consistent message about STEM• Provide tools for communications aimed at parents to:<ul style="list-style-type: none">Define STEM in common terms and increase understanding of the importance of STEM literacy to a child's future personal earnings and career; Showcase the increasing sophistication and intrigue of STEM-related careers and industries; Highlight the new, high-tech industries and their need for workers with STEM skills.• Define and communicate the return on STEM investment accrued to Minnesota by emphasizing the future economic effects if we do not increase STEM literacy across the state• Showcase students and workers across demographic groups to promote ethnic, demographic, and geographic diversity in STEM fields and careers• Implement a demonstration project in partnership with one or more organizations, such as a school district
Nevada	<ul style="list-style-type: none">• Create a statewide media-based TV/radio campaign aimed at teachers, parents, students, and the public
Tennessee	<ul style="list-style-type: none">• Build communication tools, develop messages and identify delivery channels• Conduct media outreach• Identify and showcase STEM public events• Increase STEM stakeholder engagement
Washington State	<ul style="list-style-type: none">• Aligned systems: Governor's STEM Education Innovation Alliance, Governor, legislature, and state agencies, Washington STEM, STEM networks, public and private partners

Table 2.8: Equity

State	Strategy
Federal	<ul style="list-style-type: none">• Be more responsive to rapidly changing demographics/issues by broadening participation of underrepresented groups in STEM• Focus investments on developing/testing strategies to improve STEM prep for higher education for students from underrepresented groups in STEM• Invest in efforts to create effective campus climates to improve success for students in underrepresented groups through mentorship, tech assistance, other innovations
Idaho	n/a

Maryland	<ul style="list-style-type: none"> Inclusive STEM learning environments meet the evolving needs of students, affirming the uniqueness of each as an individual and are created when academic achievement in STEM is attainable by each student regardless of demographic attributes Equitable access in STEM education provides for individual students, including those traditionally underserved, to develop STEM skills and knowledge A diverse Maryland workforce is filled with qualified graduates who are STEM proficient and can support STEM education for traditionally underserved students
Oregon	<ul style="list-style-type: none"> Improve student advising by strengthening career counseling services and tools, increasing access of students to alumni, professional, and near-peer networks, and increasing student access to up-to-date market data about high-wage, high-demand jobs Increase STEM internships, work-based and service learning opportunities, and undergraduate research opportunities in high-demand fields Increase the number and quality of P-20 support services and pre-college transition/bridge programs for students who are traditionally underserved and underrepresented in STEM Increase the number of STEM role models and access to professional networks for students who are underrepresented in STEM Increase needs-based financial support and access to flexible, micro-loan/funds for first-generation and underrepresented students pursuing high-wage, high-demand credentials
Washington State	<ul style="list-style-type: none"> Improve equity and diversity by improving outcomes for underserved populations and underrepresented populations in the state across all goals/objectives

Table 2.9: Align Public and Private Investments to Assess and Scale Programming

State	Strategy
Maine	<ul style="list-style-type: none"> Increase Maine Department of Education STEM integration and grant awards Develop common STEM goals Identify and scale up promising and proven STEM programs Collaborate with key stakeholders to assess STEM teaching and learning and the State's capacity to improve them
Michigan	n/a
Minnesota	<ul style="list-style-type: none"> Working with stakeholders and funders to develop and continually update a common set of STEM learning goals and evaluation metrics Creating a website to house and showcase a library of practices that demonstrate effective accomplishment of the evaluation metrics Continuing to inform leaders across sectors using a variety of delivery methods, including but not limited to social media, annual meetings, regional summits and professional development activities Continually updating and highlighting both proven and innovative programming
New York	<ul style="list-style-type: none"> Convene science education stakeholders to review and evaluate New York State's current assessment system for the sciences P-12 Collaborate between states to discuss and/or develop science assessments that have common blueprints Propose a P-12 science assessment system that reflects the core science content, conceptual understandings, and practices that are included in the new P-12 NYS science learning standards Develop and recommend an implementation timeline that is based on the Board of Regents' decision regarding the new P-12 NYS science learning standards and assessment system Collaborate with science education stakeholders statewide, regionally, and locally to provide

	<p>professional development for teachers and leaders that is focused on understanding and analyzing student achievement data for improving science teaching and learning</p> <ul style="list-style-type: none"> • Provide professional development opportunities for teachers and leaders to better understand the intent and design of an assessment system that is aligned to the new P-12 NYS science learning standards • Provide professional development on the use of student achievement data to foster the development of formative assessments at the local and regional levels • Continue to develop and administer valid and reliable State science assessments to drive professional development to improve teaching and student achievement
North Carolina	<ul style="list-style-type: none"> • Invest public and private funds over the next 10 years to scale effective STEM programs, policies and practices throughout every economic development region of North Carolina • Identify and fund a public/private partner for the coordination, evaluation and monitoring of STEM Education programs and initiatives • Incentivize collaborations based on evidence-based policies, programs and practice that greatly increases the number of students gaining STEM skills and continuing in STEM fields of work • Establish a formal STEM Council to facilitate and coordinate the implementation of North Carolina's comprehensive STEM Strategic Plan

Table 2.10: Reduce the STEM Talent and Skills Gap

State	Strategy
Colorado	<ul style="list-style-type: none"> • Focus on dramatically reducing the number of students needing to take remedial math courses • Increase the number and diversity of students entering postsecondary STEM pathways • Align workforce training resources with in-demand STEM skills • Excite and support females to enter STEM fields
Idaho	n/a
Tennessee	<ul style="list-style-type: none"> • Increase accelerated STEM learning opportunities • Increase partnerships between business and education • Increase STEM postsecondary degree production

Table 2.11: Formal and Informal STEM Hands-on Learning

Iowa	<ul style="list-style-type: none"> • A statutory reform should identify a STEM advocacy group for the State of Iowa. This group, whether an augmented existent body or a new creation, would be a cross- section of STEM education, business and policy leaders • The group will be a state-level voice for STEM education in Iowa when it comes to legislative advocacy and public relations. This group should be the point of contact for interface with other state and national STEM education initiatives • The group should aggregate STEM-related data into annual or specialized reports, take responsibility for benchmarking the STEM Education Strategic Plan and measure whether goals have been met • An official widely sanctioned and formalized communication network should be established by which the group interacts with statewide interests
Maryland	<ul style="list-style-type: none"> • Students will connect STEM learning to their everyday lives and futures

Table 2.12: Final Goals and Aligning Strategies

Goal	State	Strategy
Graduate Education Designed with STEM Workforce in Mind	Federal	<ul style="list-style-type: none">• Recognize/provide financial support to high potential students for contributions in science/engineering• Provide opportunities for fellows' preparation in areas critical to the nation and critical to preparing the workforce needed to advance the missions of Federal agencies - including scholarship-for-service, etc.• Continue to enhance mechanisms that evaluate the impact of fellowships to inform future Federal investments
Develop Science Learning Standards	New York	<ul style="list-style-type: none">• Develop a 5-year, statewide strategic plan for science for adoption by the Board of Regents• Develop and post a public survey to gather stakeholder feedback on comparing current NYS science learning standards and nationally developed Next Generation Science Standards (NGSS) to research-based standards evaluation criteria• Engage science education stakeholders to analyze feedback from the public survey• Convene committees of stakeholders to review feedback from the public survey, other pertinent data, and current research in science and science education, as well as other international, national, and state standards documents• Develop cross-content area benchmarks for use both within and across P-12 grade levels to support horizontal and vertical articulation between the science disciplines and other content areas• Identify convergences with engineering, technology, the New York State P-12 Common Core Learning Standards for Mathematics, and the New York State P-12 Common Core Learning Standards for English Language Arts and Literacy• Develop a reasonable timeline for the adoption of and transition to implementation of the new P-12 NYS science learning standards• Secure funding to support and sustain the implementation process at the State, regional, and local levels• Ensure that the six critical components – Standards, Curriculum, Professional Development to Enhance Instruction, Assessment, Materials and Resource Support, and Administrative and Community Support – of the 5-year strategic plan are addressed concurrently during the implementation process

Survey, Develop, and Guide Curriculum	New York	<ul style="list-style-type: none"> • Explore, identify, and provide access to pertinent research • Develop articulated P-12 guidance to support curriculum development and implementation aligned to the new P-12 NYS science learning standards • Provide funding opportunities for equitable development and/or adoption of exemplary science curriculum programming • Provide funding opportunities for equitable implementation and evaluation of exemplary science curriculum programming at the regional and local levels • Align and incorporate relevant connections to engineering, technology, the New York State P-12 Common Core Learning Standards for Mathematics, and the New York State P-12 Common Core Learning Standards for English Language Arts and Literacy • Review and update curriculum guidance and resources to be reflective of changes in instructional technology, content, and best educational practices, emphasizing active engagement in STEM • Support the implementation of exemplary, data-informed science curriculum programming and instructional materials, using cross-curricular connections from engineering, technology, the New York State P-12 Common Core Learning Standards for Mathematics, and the New York State P-12 Common Core Learning Standards for English Language Arts and Literacy that strengthen, support, and reinforce the development of scientific literacy • Leverage funding opportunities for partnerships and collaborations of science education stakeholders for the development, dissemination, and implementation of local and regional curriculum programming. • Engage education stakeholders with expertise in various disciplines to support local and regional development, dissemination, and implementation of curriculum based on the new P-12 NYS science learning standards • Create opportunities that bring students into contact with working scientists, mathematicians, and engineers through innovative curriculum design, internships, and mentorships with institutes of higher education and/or business and industry partners • Leverage existing and seek new funding sources to support the use of technology to develop, disseminate, and implement science curriculum and instructional resources through various delivery platforms • Utilize multiple platforms to access exemplary curriculum and instructional resources • Build student resources by establishing
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		community-based programs that provide relevant STEM applications in science curriculum and instructional programs
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Sustainability

Massachusetts' @Scale Initiative provides an innovative approach to sustainability in STEM education. Building upon the STEM education strategic plan, it ties economic and workforce development to educational enhancement in STEM fields. The Massachusetts STEM Advisory Council collaborated with the government, academic, and the private sector to "scale up" existing models and best practices to reach more students and adults studying and pursuing STEM education and careers. Using a private-public partnership, this initiative requires each state-funded project to secure at least \$3 in outside support or private funding for every \$1 in funding it receives from the state. By promoting local partnership through funding, it begins to pave the road to sustainability.

Iowa offers a unique action item to help in the transition for students between elementary, middle, high school undergraduate, and graduate studies. They plan to develop "Transition Guides" for use by counselors and instructors of STEM subjects at the transition points in a student's course of study to help guide students towards careers in STEM.

For the other states examined, the plans shared very similar priorities:

1. Seven states⁴ recommend the development of a STEM council or leadership organization to facilitate and implement the STEM Strategic Plan
2. Six states⁵ recommend the development of a STEM learning toolkit - an online resource for students, institutions, teachers, industry, and academia to access for STEM resources.
3. Five states⁶ recommend identifying effective and innovative programs for developing STEM education and the developing a database that catalogs and recommends effective STEM teacher development plans and pedagogy.
4. Four states⁷ recommend building evidence based approaches by conducting STEM research and evaluation to build evidence on program effectiveness.

Equity

Though five states listed equity as a primary goal for their state, eleven states had little to no mention of equity as a priority goal in their STEM Education Strategic Plan. All of the eleven states that failed to include equity as a goal *did not* neglect to mention the importance of

⁴ Florida, Iowa, Minnesota, Nevada, North Carolina, Oregon, Tennessee

⁵ Colorado, Iowa, Maryland, Minnesota, Nevada, Washington DC

⁶ Idaho, Maine, Minnesota, Nevada, North Carolina

⁷ Federal, Iowa, Maine, New York

inclusivity of people of color and women in STEM, but there were several states that *did* neglect to produce strategies to make that inclusivity happen. According to the Federal STEM Education Strategic Plan, “Underrepresented minority groups make up about 28% of the US population and are expected to boost to make up 54% of the population by 2050. Women comprise 48% of the US workforce and make up only 24% of STEM professionals” (National Science and Technology Council, 2013).

The Massachusetts Governor’s STEM Advisory Council mentions an interest-preparation gap affecting underrepresented communities in STEM in their STEM Education Strategic Plan:

One challenge is our STEM interest-preparation gap. Many students who are well-prepared are not interested in entering STEM careers, and many who are interested often are not sufficiently prepared, which has resulted in a STEM interest-preparation gap. The analysis of many years of student survey data collected from the College Board’s Scholastic Aptitude Test (SAT) and student achievement data from Massachusetts Comprehensive Assessment System (MCAS) indicate that Massachusetts schools that report the highest levels of student interest in STEM majors are many of the same (low-income) schools that report the lowest levels of student academic performance (10th grade mathematics). This high-interest low-achievement gap results in a frustrating barrier for many students, often those from communities underrepresented in STEM fields.

The three most popular strategies to promote equity in education are:

1. Six states⁸ recommend programs to recruit minorities and female students to informal and out-of-school learning environments.
2. Five states⁹ recommend professional cultural competency training to help educators become cognizant of unintended biases in classrooms that can have a negative impact on students of color.
3. Four states¹⁰ recommend early exposure to STEM in order to ignite interest and retention in STEM fields

Out-of-School Time Learning

The informal, afterschool and summer spaces offer an opportunity to supplement formal learning during the school day by providing students with hands-on activities to help inspire and engage. These spaces also provide an opportunity to create school and industry partnerships which, in turn, builds public and community awareness of STEM fields. Maryland’s STEM Education Strategic Plan mentions that “The STEM pipeline includes a number of ‘leakages;’ by providing

⁸ Iowa, Minnesota, New York, North Carolina, Oregon, Washington DC, Washington State

⁹ Florida, Iowa, Maine, Maryland, Minnesota

¹⁰ Maryland, Massachusetts, Minnesota, Washington State

students with authentic STEM learning experiences, MSDE hopes to reduce the number of students who ‘drop out of the pipeline’” (Maryland Board of Education, 2014).

The three most popular strategies of implementing Out-of-School and Informal learning into STEM are as follows:

1. Nine states¹¹ recommend increasing and sustaining youth and public engagement. OST and STEM rich institutions create what Maryland’s STEM Education plan calls a “learning ecology” that also offers the opportunity to engage parents, families, and communities.
2. Six states¹² recommend joint or similar professional development in both in- and out-of-school in order to enhance the efforts and ensure each educator is reinforcing the same content, skills, and practices even if the delivery method looks different.
3. Five states¹³ recommend creating and providing access to high-quality, tested STEM curricula for Out-of-School Time learning experiences.

Integrated STEM Curricula and Professional Development

All 17 states examined in this report acknowledge the importance of investing in STEM integrated curricula that is hands-on, minds-on, and arts/social studies inclusive.

The three most popular strategies for implementing Professional Development for educators in STEM are as follows:

1. Six states¹⁴ recommend creating and fostering professional learning communities.
2. Five states¹⁵ recommend In- and Out-of-School educators professionally STEM trained in small cohorts statewide; the cohort would then bring their skills to their region and train the educators.
3. Five states¹⁶ recommend expanding professional development in pedagogy, instructional practice, informal education, pre-service education, and continuing education.

Conclusion

This report opened with a quote from President Obama, in which he highlighted the urgency of improving, expanding, and diversifying STEM education in America. The 17 Statewide STEM Education Strategic Plans discussed here echo President Obama’s sentiments, and they represent 16 states (plus the Federal Government) that have prioritized quality STEM education for their

¹¹ Federal, Florida, Idaho, Iowa, Maryland, Minnesota, Nevada, New York, Oregon

¹² Florida, Iowa, Massachusetts, Minnesota, Nevada, Washington State

¹³ Maine, Nevada, Oregon, Tennessee, Washington DC

¹⁴ Iowa, Maryland, Minnesota, New York, Oregon, Washington DC

¹⁵ Iowa, Maryland, Massachusetts, Minnesota, Tennessee

¹⁶ Federal, Idaho, Minnesota, Nevada, New York

children. These plans are diverse and comprehensive, and they address a range of goals spanning from professional development for educators, to youth engagement and STEM achievement, to sustainability and equity, and to formal and informal learning opportunities. Together, these strategic plans represent 17 big steps towards a generation of education that engages, excites, and motivates students in science, technology, engineering, and mathematics.

But the work is not done. These 17 STEM Education Strategic Plans (which include plans from Washington D.C. and the Federal Government), leave 35 states without such plans. There is therefore the potential for 35 more big steps that work to improve the availability, quality, and diversity of STEM education. This report is intended as a tool to aid in that process. Originally created as a tool for the Oregon STEM Education Strategic Planning Committee, the comprehensive comparisons, outlines, and discussions provided here should prove useful to states looking to improve STEM education for their own students.

Appendix

Table 1.1: STEM Strategic Goals by State

Colorado	<ul style="list-style-type: none"> • Develop a state strategy to sustain and advance STEM education • Support all students P-12 in achieving STEM literacy • Build a local STEM-ready talent pipeline
Federal	<ul style="list-style-type: none"> • Improve STEM Instruction: prepare 100,000 new K-12 STEM teachers by 2020, improve existing STEM teacher workforce • Increase and sustain youth and public engagement in STEM: support a 50% increase in the number of U.S. youth who have STEM background before completing high school • Enhance STEM experience of Undergraduates: Graduate 1 million additional students with degrees in STEM fields over the next 10 years. • Better serve historically underrepresented in STEM fields: Increase the number of underrepresented minorities that graduate college with STEM degrees in the next 10 years and improve women's participation in STEM • Design graduate education for tomorrow's STEM workforce: provide graduate-trained STEM professionals with basic and applied research expertise, options to acquire skills in areas of national importance and mission agency's needs, and ancillary skills needed for success in a broad range of careers.
Florida	<ul style="list-style-type: none"> • The students - increase the percentage of students successful at each level (pk-12, postsecondary, etc) to ensure their diverse population is capable, knowledgeable, and proficient in STEM • The educators - Increase the quality and quantity of STEM educators • Sustainable infrastructure: Create a statewide sustainable STEM leadership organization to align existing/emerging STEM initiatives and represent Florida as one voice in meeting STEM demands
Idaho	<ul style="list-style-type: none"> • All students will have equitable access to P-20 STEM education opportunities, curriculum, programs, and policies that will improve P-20 student content knowledge, academic

	<p>performance, and interest in STEM, contributing to the success of students and employees entering STEM fields.</p> <ul style="list-style-type: none"> • P-20 educators will be diverse and of high quality and be prepared and able to incorporate and integrate STEM education in their curriculum and instruction. • Create awareness and support for STEM education across the state. • Develop a diverse STEM talent base that is prepared to meet the demands of a globally competitive economy and is informed by and aligned with statewide economic and workforce development initiatives.
Iowa	<ul style="list-style-type: none"> • Increased interest and performance of Iowa learners in STEM fields • Increased emphasis on STEM fields in Iowa from Pre-K through 20 • More high quality STEM teachers prepared by Iowa's institutions of higher education • An Iowa citizenry that recognizes the importance of STEM in leading productive lives and creating/sustaining a vibrant economy • A national leader in STEM workforce preparation and retention in STEM careers • Wide-scale partnership of Iowa's education systems and private enterprise • Coordinated, complementary and uniform STEM education opportunities across Iowa
Maine	<ul style="list-style-type: none"> • Overall student achievement in science, mathematics, engineering and technology demonstrates a gain of 15 percentage points within four years as measured by the combined percentage of students who "meet" and "exceed" expectations on State assessments of science and mathematics • The number of students interested in pursuing STEM-related careers increases by 15 percentage points (from 33% to 48%) within four years, as reported on the PSAT and SAT student surveys; and the number of Maine students who graduate from two-year and four-year engineering and STEM-related programs statewide increases by 10% • The STEM initiatives of the Department of Education and the STEM Collaborative, which includes governmental, non-profit and business partners, are coordinated and three million dollars in federal grants is secured by the Department of Education to support STEM learning and growth in the State
Maryland	<ul style="list-style-type: none"> • Equip educators with skills and tools for learning that create and/or enhance their capacity to offer high quality STEM instruction for all students • Provide access to high-quality STEM resources that support teaching and learning of content and STEM proficiencies to prepare students for post-secondary study and careers • Promote equity in STEM education by providing access to effective evidence-based strategies • Provide every student with the opportunity to participate in authentic STEM hands-on learning experiences during in-school instruction and out-of-school time learning • Provide STEM stakeholders with a clear message and an accompanying communication plan to promote, expand, and disseminate information about the inclusiveness, importance, and innovation of STEM education
Massachusetts	<ul style="list-style-type: none"> • Student Interest • Student Achievement • Skilled Educators • Post-secondary STEM preparation • Employment Opportunities
Michigan	<ul style="list-style-type: none"> • Promote, inspire, and empower STEM education instruction

	<ul style="list-style-type: none"> • Engage employers in STEM education and career development • Ensure the viability of STEM education and the Partnership, and maximize the impact of partners such as the Michigan Mathematics and Science Centers Network • Actively connect STEM initiatives and programs
Minnesota	<ul style="list-style-type: none"> • Public Awareness: Engage Network Members in building excitement for STEM disciplines and public awareness of the importance of a strong STEM work force to Minnesota's future: "Make STEM Cool" • Regional Hubs: Foster and support the development of regional hubs to encourage cross-sector collaboration, implement regional STEM education goals, and regionally promote STEM learning opportunities • Funders Coalition: Organize a coalition of philanthropic funders to support STEM education, provide them with objective information about high value STEM programming, and help develop standards for funding STEM initiatives • Professional Development: Increase awareness of professional development opportunities in formal and informal STEM educator communities, and foster cross-institutional collaboration to make these opportunities more widely available • Trusted Information Resource: Collect and disseminate research on STEM learning and statewide progress to policymakers, regional hubs, and other stakeholders • High Quality Practice Dissemination: Support the dissemination of high quality STEM education practices across sectors and regional hubs
Nevada	<ul style="list-style-type: none"> • Approve an organizational structure that fully integrates G2 inc. and the Nevada STEM Coalition in order to build statewide partnerships, strength in numbers for advocacy for STEM education, and increased funding through collaborations to meet our mission and goals. The board will develop a long-term strategic plan and seek seed funding for the initiative • Increase student access to and involvement in informal education opportunities supporting the classroom by raising awareness among teachers, the community, and business community about the opportunities • Create and manage phase one of a communications system (including a website) that (1) provides STEM resources for teachers, students, business, and community; (2) supports meetings and collaborations to scale up and align exemplary curriculum; (3) shares and recognizes exemplary, research-based professional development and classroom practices; (4) recruits STEM experts and volunteers and connects them to teachers and students; (5) raises friends and funds, (6) raises awareness and support from the community and state government; and (6) increases student access to STEM career information and engagement with business. • Develop and implement a messaging/marketing campaign to increase support for STEM education, research-based teaching practices, and changes to education that are long overdue. • Identify and disseminate research-based models for teacher professional development (workforce retraining) and classroom/nonformal STEM teaching practices, and establish a recognition system for exemplary professional development, teachers, programs, and schools that are reaching all populations. • Increase our membership and collaboration with stakeholders to promote statewide alignment of exemplary curriculum development for STEM and to promote increased state and community support.
New York	<ul style="list-style-type: none"> • Standards: Adopt new P-12 NYS science learning standards and 5-year strategic plan.

	<ul style="list-style-type: none"> • Curriculum: Provide opportunities that are reflective of research and best practices for P-12 students to engage with scientific phenomena through implementation of innovative science curriculum programming that fosters learning, deep understanding, and application of core science content, conceptual understandings, and practices • Professional Development to Enhance Instruction: Initiate, build, and sustain collaborations and partnerships to provide specific and focused professional development to support the teaching and learning of core science content, conceptual understandings, and practices P-12 • Assessment: Support the development of assessments at the state, regional, and local levels that measure student achievement of all new P-12 NYS science learning standards, and use the data resulting from these assessments to enhance teaching and learning • Materials and Resource Support: Support regular and substantive teaching and learning of core science content, conceptual understandings, and practices through scientific inquiry and authentic engagement with natural phenomena by providing models of effective systems management and dissemination of science materials • Administration and Community Support: Build the capacity to enhance science education and ensure career readiness by involving STEM stakeholder partnerships and alliances between school districts, institutions of higher education, science education professional organizations, business and industry, informal education organizations, government agencies, and the larger learning communities: local, regional, state, national, and international arenas
North Carolina	<ul style="list-style-type: none"> • Increasing our student, teacher, and institutional STEM achievement • Increase student interest in STEM Fields/continuing education • Increase STEM achievement in k-12 students • Increase graduation rate of students in STEM programs • Decrease postsecondary remediation rates • Increase the number of teachers prepared and delivering integrated STEM education • Increase community understanding, awareness, and support for the economic challenges • Increase the connections, partnerships, and growth of high-quality programs, schools, and tools. • Increase returns on public and private investments in STEM education • Align and coordinate the investments of public and private sector partners to scale high-quality programs efficiently
Oregon	<ul style="list-style-type: none"> • Inspire and empower our students to develop the knowledge, skills, and mindsets necessary to thrive in a rapidly-changing, technologically rich, global society. • Ensure equitable opportunities and access for each and every student to become a part of an inclusive innovation economy. • Continuously improve the effectiveness, access to resources, and the number of formal and informal STEM educators. • Create sustainable and supportive conditions to achieve STEM outcomes aligned to Oregon's economic, education, and community goals.
Tennessee	<ul style="list-style-type: none"> • Increase student interest, participation, and achievement in STEM • Expand student access to effective STEM teachers and leaders • Reduce the state's STEM talent and skills gap • Build community awareness and support for STEM
Washington DC	<ul style="list-style-type: none"> • To prepare all students in DC to graduate high school with a college and career ready mastery of math, science, engineering and technology

	<ul style="list-style-type: none"> • To increase the number of DC students who major in STEM fields in college and enter STEM careers
Washington State	<ul style="list-style-type: none"> • Prepare, support, and retain excellent early learning through high school STEM teachers • Inspire early learning through high school Washington youth through real-world STEM learning opportunities • Raise public awareness and support for STEM • Prepare Washington's future workforce by graduating additional students with certificates and degrees in high-demand STEM fields and retraining adult workers with high-demand skills • Improve equity and diversity by improving outcomes for underserved and underrepresented populations in the state across previous 4 objectives

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