

Your Question: You asked how other states are funding STEM and Career and Technical Education (CTE) initiatives, including general fund, fee-based, bonding, etc.

You also expressed interest in state approaches such as the Utah STEM Action Center that consolidate oversight, funding, and evaluation for multiple STEM activities from the early grades through postsecondary, and Massachusetts' STEM Networks, which establish criteria that regional STEM networks must meet to be eligible for funding.

State STEM and CTE funding sources

Our Response: Generally speaking, states fund STEM and CTE initiatives through the general fund. No examples of fee-based programs were identified.

The section that follows provides a pair of examples of STEM programs supported by general funds, as well as legislation authorizing the following mechanisms to support STEM and CTE efforts:

- Public/private partnerships
- Bond proceeds
- Tax credits
- Trusts or foundations
- Lottery funds.

STEM line items in general fund

STEM line items typically support initiatives with a specific focus or identified approach. 2015 examples include:

Massachusetts: 2015 [H.B. 3650](#) provides a \$4,750,000 appropriation to support **STEM Starter Academy program** to be implemented through the department of higher education at one or more community colleges **to benefit student populations identified by the department as having expressed a high level of interest in STEM majors and STEM careers but underperforming on STEM academic assessments.** The bill directs the STEM Starter Academy program to incorporate best practice design elements from established STEM career pathways initiatives including, but not limited to, those recognized by the Massachusetts' Plan for Excellence in STEM Education. The bill also requires that the STEM Starter Academy incorporate employer and industry collaboration to address workforce needs in high-demand fields, industry contextualized STEM curriculum, embedded math and English language remediation and student supports and other STEM education research-based strategies that promote enrollment, enhance retention and increase post-secondary graduation rates and pathways to job placement or transfer to 4-year degree programs.

Michigan: 2015 H.B. 4115 provides up to \$340,000.00 for 2015–2016 for a **pre-college engineering K–12 educational program** focused on the development of a diverse future Michigan workforce, that serves multiple communities within southeast Michigan, that enrolls pupils from multiple districts, and that received funds appropriated for this purpose in the appropriations act that provided the Michigan strategic fund budget for 2014–2015. Eligible programs must be able to expose students to, and motivate and prepare students for STEM careers and postsecondary education, with special attention given to groups of students who are at-risk and underrepresented in technical professions and careers.

Public/private partnerships

Multiple states have either passed statutory provisions to create, or included recent line items in appropriations bills to support public/private partnerships supporting STEM and/or CTE education. Examples of these states include:

Ohio: 2015 [H.B. 64](#) creates and provides a \$750,000 appropriation in FY 2017 for grants for the **STEM Public-Private Partnership Pilot Program**. The program is to operate in FY 2017 to encourage public-private partnerships between high schools, colleges, and the community to provide high school students the opportunity to receive education and training in a targeted industry, as defined by [JobsOhio](#) while simultaneously earning high school and college credit for the course. The measure requires the Chancellor of Higher Education to administer the program and select five partnerships, one from each quadrant of the state and one from the central part of the state, each to receive a grant of \$150,000. Rules adopted by the Chancellor of Higher Education to administer the program must establish requirements for applying for program approval. The rules must also include all of the following operational requirements for the program:

- (1) Partnerships must consist of one community college or state community college, one or more private companies, and one or more high schools, either public or private.
- (2) For purposes of the program, the partnering community college or state community college must pursue one targeted industry during the pilot period. However, the college may partner with multiple private companies within that industry.
- (3) Students that take courses offered under the program must earn college credit for that class from the community or state community college.
- (4) Participating students, high schools, and must do so under the [College Credit Plus Program](#), the state's statutorily established dual enrollment program.
- (5) The curriculum offered by the program must be developed by and agreed upon by all members of the partnership.
- (6) The private company or companies that are part of the partnership must provide full- or part-time facilities to be used as classroom space.

In addition, Section 263.140 of H.B. 64 provides that up to \$600,000 in unexpended, unencumbered balances from appropriations for the Department of Education at the end of fiscal year 2015 is reappropriated for FY 2016 for the Department of Education **to provide STEM schools with matching funds for industry workforce development initiatives**.

Massachusetts: 2015 [H.B. 3650](#) continues the state's commitment to the Massachusetts Technology Collaborative. H.B. 3650 makes a \$1.7 million appropriation to the collaborative to **develop and implement a plan to promote and establish computer science education** in the public schools. The measure requires the Massachusetts Technology Collaborative **to seek out matching private funds equal to \$1 for every \$1 contributed** by the collaborative.

Specifically, H.B. 3650 establishes M.G.L.A. 40J § 6I, which requires the collaborative to serve as the state agent in support of the objectives of the Massachusetts Computing Attainment Network, or MassCAN. The measure directs MassCAN, subject to the availability of funds, to:

- Promote the development and implementation of educational programs, courses and modules for K-12 students and teachers
- Collaborate with the department of elementary and secondary education in developing new voluntary K-12 computer science standards
- Collaborate with the department of higher education to create computer science professional development hubs at universities in each of the regional science, technology, engineering and mathematics, or STEM, networks established by the department

- Develop a school district-based program to assist teachers and administrators with the implementation of new computer science courses
- Develop and maintain a website to share computer science resources and broadly communicate best practices and successes
- Connect computer science students with industry professionals to enhance students' understanding of the relevance of their educational experience to the workplace and STEM career opportunities
- Identify the particular needs of school districts with disproportionately high numbers of underrepresented minorities
- Leverage at least \$1 in matching funds from private sources of funding for every \$1 expended within the commonwealth.

MassCAN must take into consideration the recommendations of the STEM advisory council established in section 218 of chapter 6 when developing and implementing educational programs.

2015 H.B. 3650 also provides a \$1.5 million appropriation to the Massachusetts Technology Collaborative for talent pipeline initiative that includes **paid internships for students seeking careers in technology and innovation industries** to work with companies competing actively in those fields. As with the computer science initiative noted above, the bill requires the Massachusetts Technology Collaborative to seek **private funds to provide a dollar match for each dollar contributed by the Massachusetts Technology Collaborative** through the internship program. The bill calls for the program to undergo an evaluation and for annual reporting to legislative committees, including that the paid internship program report include the number of placements of students in paid internships during the academic year and an analysis of the impact of the program on the ability of its participants to enter the full-time job market in the technology and innovation industries after graduation.

In addition, 2015 H.B. 3650 provides \$2.7 million for a competitively bid, statewide performance-based, integrated **program to increase participation and performance in Advanced Placement (AP) courses**, particularly among underserved populations, to prepare students for college and career success **in STEM and English**. The program must provide a matching amount of at least \$1,000,000 in private funding for direct support of educators and other uses.

Program funds must support all of the following program elements for each participating school:

- Open access to courses
- Equipment and supplies for new and expanded AP courses
- Support for the costs of AP exams
- Support for student study sessions

H.B. 3650 permits these funds to support teacher professional development, including a College Board-endorsed AP summer institute for math, science and English AP teachers. The program must work in conjunction with an existing, separately funded, statewide pre-AP program.

Further, H.B. 3650 establishes an **Economic Empowerment Trust Fund, an expendable trust fund** not subject to appropriation or allotment, and a 20-member board of trustees to oversee the fund. The measure provides that dollars from the fund are to encourage and facilitate economic empowerment throughout the commonwealth. Funds may be expended to support economic empowerment programs, **including** but not limited to **establish college and career readiness programs, particularly in STEM areas**. The fund may accept private contributions, publicly or privately-funded grants and funds appropriated by the state or federal government.

Iowa: 2015 [H.F. 658](#) provides \$5.2 million to support the STEM collaborative initiative established in statute. Of the appropriation, at least \$500,000 must be used to **provide technology education opportunities** to high school, career academy, and community college students **through a public-private partnership**, as well as

opportunities for students and faculties at these institutions to secure broad-based information technology certification. The partnership must provide all of the following:

- A research-based curriculum
- Online access to the curriculum
- Instructional software for classroom and student use
- Certification of skills and competencies in a broad base of information technology-related skill areas
- Teacher professional development
- Deployment and program support, including but not limited to integration with current curriculum standards.

New Jersey: 2014 [A.B. 3339](#) explicitly authorizes high school CTE courses approved by the Department of Education to be taught at a location other than the school district, and exempts such courses from certain state regulations regarding educational facility standards, approval as a temporary facility, and the district's long range facilities plan. However, the location at which the CTE program is taught must meet the requirements of the uniform construction code and all applicable health and safety standards.

Washington: [Statute](#) directs the superintendent of public instruction to provide support for statewide coordination for math, science, and technology, including employing a statewide director for math, science, and technology. The duties of the director as established in statute include developing and maintaining public-private partnerships to generate business and industry assistance to accomplish the following:

- Increasing student engagement and **career** awareness, including increasing student participation in school clubs, state-level fairs, national competitions, and encouraging partnerships between students and university faculty or industry to facilitate such student participation
- Creation and promotion of student scholarships, internships, and apprenticeships
- Provision of relevant teacher experience and training, including on-the-job professional development opportunities
- Upgrading K-12 school equipment and facilities to support high quality math, science, and technology programs.

Bond proceeds

Massachusetts: [Statute](#) establishes a separate fund to be known as the **Massachusetts Science, Technology, Engineering, and Mathematics Grant Fund** (known as the **Pipeline Fund**). [Created in 2003](#), the purpose of the Pipeline Fund is to increase the number of students who participate in programs that support careers in fields related to STEM. The commissioner of higher education, in consultation with the commissioner of education and the president of the University of Massachusetts, must provide grants and other disbursements to support activities intended to increase the number of STEM teachers and to improve the STEM educational offerings available in public and private schools. Funds may support:

- The development and use of innovative curricula, courses and programs in STEM for new teachers and in-service teachers that provide appropriate STEM content, and instruction in innovative ways to teach STEM including the use of hands on, experimental learning and e-learning, that are consistent with the Massachusetts standards and curriculum frameworks
- The development of a STEM network to create, implement, share and make broadly and publicly available the best practices and innovative programs relative to STEM instruction and expanding and maintaining student interest in STEM studies and careers
- Effective ways to teach STEM
- Give priority to grants that provide effective course and curricula for in-service teachers in low income schools or school districts

- Summer programs for high school students, with appropriate stipends, that would allow interested and motivated students to intern in private or nonprofit corporations or in public programs that are in a position to further their interest, knowledge and experience in these fields; provided, that priority for the summer programs must be given to students in groups that are presently underrepresented in these fields including, but not limited to, persons of color, women, and those whose native language is not English.

Statute explicitly authorizes **bond proceeds** to be credited to the Pipeline Fund, along with funds from other sources (i.e., appropriations or other monies authorized by the legislature and specifically designated to be credited to that fund, and any additional funds designated by the corporation for deposit into the Pipeline Fund, including any pension funds, federal grants or loans, or private donations.)

Tax credits

Missouri: [Statute](#) defines an “innovation education campus” or “innovation campus” as an educational partnership that includes at least one of each of the following:

- A Missouri high school or school district
- A Missouri four-year public or private postsecondary institution
- A Missouri-based business
- A Missouri two-year public higher education institution or state technical college.

Under the 2014 Innovation Campus Tax Credit Act, a taxpayer (including a person, firm, partner in a firm, corporation, or a shareholder in an S corporation doing business in the State of Missouri and subject to the state income tax, a corporation subject to the annual corporation franchise tax, as well as other enumerated companies, institutions and charitable organizations) is allowed a credit against taxes otherwise due, in an amount equal to 50% of the amount of an eligible donation. An eligible donation may include cash, publicly traded stocks and bonds, and real estate. Eligible donations are to be used solely for projects that advance learning in STEM fields.

To claim a credit, an innovation campus may submit an application for the tax credit to the Missouri Department of Economic Development. To be eligible for program funds, innovation campuses must meet criteria established in [statute](#), including that:

- The innovation education campus provides applied and project-based learning experiences for students and leverages curriculum developed in consultation with partner Missouri business and industry representatives
- Students graduate from the innovation education campus with direct access to internship, apprentice, part-time or full-time career opportunities with partnering Missouri-based businesses
- The innovation education campus engages and partners with industry stakeholders in ongoing program development and program outcomes review.

Alabama: [Statute](#) authorizes a taxpayer to filing a state income tax return to claim a tax credit for a contribution made to the Department of Postsecondary Education for qualifying educational expenses directly associated with the Career-Technical Dual Enrollment Program. The credit may be claimed in an amount equal to 50% of the total contribution(s) made to the Department of Postsecondary Education during the taxable year for which the credit is claimed, but not to exceed an amount greater than 50% of the taxpayer's total Alabama income tax liability, or more than \$500,000 for any given tax year. Total tax credits issued may not exceed \$5 million annually.

While tax credits were available to taxpayers filing returns after January 1, 2015, February 2016 communications with state agency staff suggest that there has been little marketing of the program, and very little response to date. A representative from one community college suggested that, to her knowledge, while her institution received substantial general state fiscal support for CTE dual enrollment, her institution had received no funding from the tax credit.

Various states: A number of states provide a tax credit to businesses filing a corporate tax return that provide paid work-based learning opportunities, including mentorships, internships and apprenticeships, to high school and postsecondary students, including in specified STEM and CTE fields. Additional information on these programs is available upon request.

Trusts or foundations

Utah: One of the provisions of the enabling [statute](#) for the Utah STEM Action Center (more details about the STEM Action Center below) authorizes the STEM Action Center Board to establish a foundation to assist in the development and implementation of the programs authorized under this part to promote STEM education, as well as implementation of other STEM education objectives. The foundation may solicit and receive contributions from a private organization for STEM education objectives, but may not exercise executive or administrative authority over the programs or other activities defined in statute for the STEM Action Center, except to the extent specifically authorized by the board.

Rhode Island: A 2014 [provision](#) creates a permanent, not-for-profit corporation to be known as the Rhode Island CTE trust on career and technical education. The CTE trust must coordinate with, but remain independent from, both the Rhode Island Department of Education and the board of education. [Statute](#) directs the CTE trust to:

- Raise funds for the use of the organization to provide grants and loans to the state board and for other purposes as determined by the private board
- Create partnerships with various employers to provide for internships, apprenticeship programs, voluntary work relationships, and other such partnerships that provide for student learning
- Provide advisory assistance to the board of trustees in the development of programs, curriculum, areas of focus, and concentration
- Provide any other assistance to the state board, board of education, or to the general assembly.

Lottery funds

Montana: 2015 [legislation](#) creates the Montana STEM scholarship program, to provide a scholarship of up to two years to eligible students who have declared a STEM or health care major while seeking the student's first certificate or 2-year or 4-year degree at a postsecondary institution. The 2015 legislation also creates a Montana STEM scholarship program account within the state special revenue fund to fund the Montana STEM scholarship program. There must be paid into the account the lottery net revenue calculated pursuant to [statute](#).

State-level consolidation of STEM efforts (including consolidation of funding)

Utah STEM Action Center

While STEM efforts in many states are housed within various K-12 or higher education agencies, the Utah STEM Action Center provides one model for coordinating STEM activities (and consolidating funding for those activities) from the early grades through postsecondary. The STEM Action Center, housed in the governor's Office of Economic Development, is charged with numerous duties, including:

- Those assigned the director in paragraph (2) of U.C.A. § [63N-12-204](#)
- Collaboration with the State Board of Education to develop STEM education endorsements and financial incentives for an educator to earn an elementary or secondary STEM education endorsement, and for a school district or charter school to have STEM endorsed educators on staff
- Selection of providers to offer a STEM education high quality professional development app
- Development of an applied science initiative for students in grades 7-8

- Awarding of grants to districts and charter schools to fund STEM related certification for high school students.

Statute also creates a STEM Action Center Board. [U.C.A. § 63N-12-204](#) directs the board to strategically engage industry and business entities to cooperate with the board to provide private funding and support for the STEM Action Center, and to support high quality professional development and provide other assistance for educators and students. [U.C.A. § 63N-12-205](#) likewise requires the board, as funding allows, to engage private entities to provide financial support or employee time for STEM activities in schools in addition to what is currently provided by private entities.

Statute also directs the board to apply for, receive, and disburse funds, contributions, or grants from any source for the purposes set forth in statute.

Idaho 2015 [H.B. 302](#) codifies the STEM Action Center and STEM Action Center board. The legislation closely mirrors the enabling legislation for the Utah STEM Action Center.

Establishing quality assurance criteria for awarding of state funds to regional efforts

In contrast to Utah’s state-level coordination of STEM activities are state approaches that require regional CTE or STEM initiatives to meet certain criteria and conduct specific activities to be eligible for program funds. The section that follows provides details on such approaches in California and Massachusetts.

California Career Pathways Trust

Established in the [2013 appropriations bill](#) and [codified](#) in 2014, the California Career Pathways Trust has received a \$250 million appropriation each year 2013 through 2015. The California Career Pathways Trust establishes a competitive grant process whereby a recipient (a school district, county office of education, direct-funded charter school, regional occupational center or program operated by a joint powers authority, or community college district.

Recipients must do all of the following:

- Prioritize work-based learning opportunities for pupils and students in partnership with regional business and industry, state and local governmental entities, and nonprofit and community-based organizations.
- Define the labor market of the regional economy in a manner that identifies high-skill, high-wage, high-growth jobs in the current regional economy or in emerging economic sectors.
- Establish or strengthen existing regional collaborative relationships and partnerships among business entities, schools serving K-12 students, and postsecondary educational agencies, organizations that provide apprenticeship opportunities, and nonprofit or government entities.
- Develop and integrate standards-based academics with a career-relevant, sequenced curriculum following industry-themed pathways that are aligned to high-skill, high-wage, high-growth jobs in the current regional economy, or in emerging regional economic sectors.
- Provide articulated pathways from high school to postsecondary education and training that are aligned with the workforce development needs of regional economies.
- Ensure that career pathway programs are designed and implemented in a manner that leads students to a postsecondary degree or certification in a high-skill, high-wage, and high-growth or emerging field.
- Leverage and build on any of the following:
 - Existing structures, requirements, and resources of the Carl D. Perkins Career and Technical Education Improvement Act of 2006, California Partnership Academies, and Regional Occupational Centers and Programs.
 - The California Community Colleges Economic and Workforce Development Program.
 - Matching resources and in-kind contributions from public, private, and philanthropic sources.

West's Ann. Cal. Educ. Code § 53013 establishes various requirements for recipients, including annual collection and submission of data on program outcomes, including all of the following:

- Pupil and student academic performance indicators
- The number and rate of school or program graduates
- Attainment of certificates, transfer readiness, and postsecondary enrollment
- Transitions to appropriate employment, apprenticeships, or job training.

More details on the program may be found on the California Department of Education [website](#).

Massachusetts Regional STEM Networks

In July 2015, Massachusetts published “[Recommended Functions and Related Performance Criteria for STEM Networks](#)”, to establish common eligibility criteria and performance benchmarks for the [nine Regional STEM Networks](#) operating in the state. While the nine Regional STEM Networks were launched in 2004, the “Recommended Functions” document observes that “some Networks primarily focused on the management of a particular project, or small set of projects, that they were funded to implement.” The July 2015 document identifies three criteria for a STEM Network to be eligible for funding, including related to a strong lead partner, creation of an Advisory Board/Steering Committee comprised of specific K-12, higher education and business stakeholders, and examples of engagement with STEM partners and employers to identify and address regional STEM education and workforce needs.

The “Recommended Functions” document also identifies performance criteria Regional Networks must address, related to:

- Informing regional stakeholders about the region’s STEM initiatives and needs related to the three themes of the [state STEM plan](#) (knowledge of interests/needs, awareness of STEM initiatives, and communications/public outreach)
- Active coordination with regional STEM partners to inform regional STEM initiatives and enhance access and engagement of an array of stakeholders in the three themes of the state STEM plan
- Monitor changes in, and status of, regional STEM metrics related to the five quantitative goals of the state STEM plan to evaluate impact of STEM initiatives and collaborations.