

V.A.

CONNECTICUT STATE BOARD OF EDUCATION

Hartford

TO BE PROPOSED:

October 3, 2018

RESOLVED, That the State Board of Education adopts the Position Statement on Comprehensive STEM Education for All Students K-12.

Approved by a vote of _____, this third day of October, Two Thousand Eighteen.

Signed: _____

Dr. Dianna R. Wentzell, Secretary
State Board of Education

CONNECTICUT STATE BOARD OF EDUCATION
Hartford

TO: State Board of Education

FROM: Dr. Dianna R. Wentzell, Commissioner of Education

DATE: October 3, 2018

SUBJECT: Adoption of the Position Statement on Comprehensive STEM Education for All Students K-12

Executive Summary

Introduction

The Connecticut State Board of Education (Board) believes the promise of an excellent public education is to equip every child with the knowledge and skills needed to succeed in college, careers and civic life. Therefore, schools must provide challenging and rigorous programs of study that integrate the knowledge and skills necessary to enable all students regardless of age, gender, socio-economic status, race/ethnicity, native language, abilities or disabilities to become productive members of society.

The Board believes that a comprehensive science, technology, engineering and mathematics (STEM) education is key to preparing students to be innovators, problem solvers, and critical thinkers. The Board supports the expansion of access to high-quality STEM programming for all students and believes every student deserves a comprehensive STEM education that is rich in discipline-specific content and develops interdisciplinary literacy.

History/Background

The Connecticut State Department of Education (CSDE) worked closely with the Mathematics, Science, and Technology Leadership Council to create a STEM position statement. This council was composed of representatives from the following organizations:

- Connecticut Center for Advanced Technology (CCAT)
- Associated Teachers of Mathematics in Connecticut (ATOMIC)
- Connecticut Association of Biology Teachers (CT-ABT)
- Connecticut Association for Mathematically Precocious Youth (CAMPY)
- Connecticut Association of Physics Teachers (CAPT)
- Connecticut Chemistry Teachers (C2T)
- Connecticut Community Colleges (CCC)
- Connecticut Computer Science Teachers Association (CCSTA)
- Connecticut Council of Leaders of Mathematics (CCLM)
- Connecticut Educators Computer Association (CECA)
- Connecticut Geographic Alliance (CGA)
- Connecticut Outdoor & Environmental Education Association (COEEA)
- Connecticut Science Supervisors Association (CSSA)

- Connecticut Science Teachers Association (CSTA)
- Connecticut State Department of Education (CSDE)
- Connecticut Technology Education Association (CTEA)
- Southeastern New England Marine Educators (SENEME)
- Mathematics Association of Two Year Colleges in Connecticut (MATYCONN)
- Project to Increase Mastery of Mathematics and Science (PIMMS)

The position statement is aligned to the Next Generation Science Standards (NGSS) and the Board's *Ensuring Equity and Excellence for All Connecticut Students: The Connecticut State Board of Education's Five-year Comprehensive Plan, 2016-21*. In January 2017, stakeholder feedback was elicited from members of the Connecticut Science Teachers Association, Connecticut Science Supervisors Association, Associated Teachers of Mathematics in Connecticut, and Connecticut Council of Leaders of Math. Their feedback was incorporated and the revised position statement was reviewed by another group of expert Connecticut reviewers representing higher education, science supervisors, and science teachers.

On December 11, 2017, the draft *Position Statement on Comprehensive STEM Education for All Students K-12* was introduced to the State Board of Education Academic Standards and Assessment Committee for review and consideration. The Committee's feedback from this meeting was incorporated and reviewed at the February 26, 2018, meeting. On February 26, 2018, the Committee approved moving the *Position Statement on Comprehensive STEM Education for All Students K-12* forward to the full Board for review and consideration of adoption.

Recommendation

The CSDE presents the *Position Statement on Comprehensive STEM Education for All Students K-12* for review and consideration of adoption.

Next-Steps

The CSDE will continue to work with multiple partners to ensure that when the *Position Statement on Comprehensive STEM Education for All Students K-12* is adopted, there are accessible resources and professional learning for all districts regarding increasing the quality of and expanding the access to STEM education at the elementary, middle and high school levels.

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Approved by: Melissa K. Wlodarczyk Hickey, Ed.D.
Reading/Literacy Director

CONNECTICUT STATE BOARD OF EDUCATION
Hartford
Position Statement on
Comprehensive STEM Education for All Students K–12

The Connecticut State Board of Education (Board) believes the promise of an excellent public education is to equip every child with the knowledge and skills needed to succeed in college, careers and civic life. Therefore, schools must provide challenging and rigorous programs of study that integrate the knowledge and skills necessary to enable students to become productive members of society. These expectations hold for all students regardless of age, gender, socio-economic status, race/ethnicity, native language, abilities or disabilities.

The Board believes that a comprehensive science, technology, engineering and mathematics (STEM) education is key to preparing students to be innovators, problem solvers, and critical thinkers. The Board believes every student deserves a comprehensive STEM education that integrates the knowledge, skills, and practices of the individual STEM disciplines. High-quality STEM instruction should be inquiry-based and provide students with the ability to analyze and propose solutions to complex problems. A comprehensive STEM education prepares students not only to be literate in the specific disciplines but also to make connections between the disciplines. Making connections between the disciplines is key for students to determine the appropriate application of discipline-specific skills and concepts when facing the challenges of a continually evolving society.

STEM education requires adequate time, resources and instruction that includes engaging opportunities. STEM instruction must provide students time to investigate, question and solve complex problems. The Board believes that Connecticut schools must increase efforts to provide a comprehensive STEM education to all students.

Finally, the State Board believes that comprehensive K–12 STEM education is only realized through the incorporation of meaningful partnerships among STEM business and industry representatives, post-secondary educational programs, community colleges and universities, community organizations, families and school districts. Each of these stakeholders is necessary in order for students to understand the connections between their classroom work and skills required to be college and career ready.

Components of High-Quality STEM Education: Guidelines for Policymakers 2018

The Connecticut State Board of Education provides the following guidelines to support collaboration among the state's various stakeholders to build a high-quality, comprehensive, coordinated and culturally responsive STEM Education program for all Connecticut students, K–12. High-quality STEM Education instruction should be content rich, inquiry based, use standards across disciplines and provide for students to analyze and propose solutions for complex problems.

Department of Education's Responsibilities:

- Lead a statewide effort to increase the quality of and expand access to STEM education at the elementary, middle and high school levels.
- Encourage appropriate professional development opportunities for all Connecticut STEM educators.
- Require all STEM teachers hold the appropriate certificate for their assignment.
- Collaborate with higher education institutions, business, and industry to strengthen STEM skills in Connecticut students.

School Districts' Responsibilities:

- Provide safe, effective, STEM learning environments at all grade levels.
- Provide opportunity for teachers across disciplines to collaborate, plan, develop, and implement high-quality STEM lessons and activities.
- Provide meaningful professional development, resources, instructional materials and technologies to support STEM education.
- Ensure all STEM teachers hold the appropriate certificate for their assignment.
- Develop students' abilities to question, explore, observe, synthesize and draw conclusions based on their understanding of STEM related problems.
- Provide opportunities for students to explore STEM related careers.
- Encourage family and community participation in STEM events during and beyond the school day that promote the importance of STEM.

Families' and Community Members' Responsibilities:

- Support students' interests in STEM by encouraging them to speak about what they are learning at school and how this relates to daily life.
- Use community resources to support students' understanding of STEM.
- Work with teachers to support students' STEM engagement.

Higher Education Institutions' Responsibilities:

- Provide pre-service and in-service teachers with experiences that use relevant research in STEM education to support effective student learning.

- Provide pre-service and in-service teachers with opportunities to engage in meaningful STEM learning activities relevant to the full diversity of students and educational settings across Connecticut.
- Provide a collaborative process to align STEM educational programs and develop strategic partnerships between K–16.
- Partner with local districts to strengthen STEM skills for all Connecticut students using an active feedback mechanism to level expectations across K–16.
- Create new programs for pre-service teachers with a focus on STEM Education.

Business and Industry Stakeholders’ Responsibilities:

- Engage students, schools and families in community-based STEM activities to support and enhance STEM education opportunities.
- Develop ongoing, systematic partnerships with schools to support and enhance STEM education.
- Provide mentoring and internships for teachers and students.
- Actively sponsor, support, and participate in extracurricular STEM activities.

Other Educational Institutions’ Responsibilities (e.g., museums, teaching centers, etc.):

- Develop ongoing, collaborative partnerships with schools, teachers, students and families to support and enhance STEM Education.
- Provide STEM enrichment experiences for students, families, and educators before and after school, on weekends, during school holidays, and over the summer.