



Lillian M. Lowery, Ed.D.
State Superintendent of Schools

200 West Baltimore Street • Baltimore, MD 21201 • 410-767-0100 • 410-333-6442 TTY/TDD • MarylandPublicSchool.org

TO: Members of the State Board of Education
FROM: Lillian M. Lowery, Ed.D. *Lillian M. Lowery*
DATE: October 28, 2014
SUBJECT: Science, Technology, Engineering, and Mathematics (STEM) Strategic Plan Update

PURPOSE:

A brief update will be provided to the State Board that will share the STEM education strategic plan and its website.

BACKGROUND:

In 2009, a STEM report was submitted to Governor Martin O'Malley by the Governor's STEM Task Force. This report made seven recommendations aimed at establishing Maryland as a global leader in the development of its workforce of the future and its STEM-based research and economic development infrastructure. In 2014, the Maryland State Department of Education will build on the work of the 2009 report. State leaders recognize that a student's STEM educational experience is not contained within the walls of a classroom, but is more inclusive in approach to early childhood, after and out of school programs, higher education, etc. Our goal is to build a plan that will provide all students with a seamless STEM educational experience. This experience should provide high school graduates with rigorous content and the 21st century skills needed to be college and career ready.

EXECUTIVE SUMMARY:

It is important for the Board to be updated on the leadership and resources MSDE is providing in STEM education through strategic planning, work occurring in districts, and online resources. The website containing all of this information will be shared with the State Board at the meeting. This work will help further the mission of STEM educators and provide our students with skills and knowledge they need to be productive members of the workforce.

ACTION:

No action required, for discussion only.



Five focus areas of the Maryland STEM education strategic plan

Focus Area	Goal Statement
Professional learning	Equip educators with skills and tools for learning that create and/or enhance their capacity to offer high quality STEM instruction for all students.
STEM resources	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.
Equity	Promote equity in STEM education by providing access to effective evidence-based strategies.
Student STEM learning experiences	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.
Communication	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.

Descriptions of Five Focus Areas

Professional learning: Providing educators with understanding and tools for learning can enhance their capacity to offer high quality STEM instruction for all students. Interfacing with educators and stakeholders around the state has uncovered gaps in understanding about STEM education, specifically, what it is, why it is important, and how it can be implemented as a regular part of daily instruction. These gaps in knowledge and/or skills can be addressed through professional learning targeted towards building teachers' STEM content and pedagogical knowledge, increase abilities to create integrated STEM activities, and find ways to collaborate with each other.

STEM resources: Preparing today's students for tomorrow's workforce is a complex task and can be enhanced by providing access to high-quality resources. Maryland is rich in STEM resources, but there lacks common criteria to determine the quality of resources, shared metrics to determine the effectiveness of resources, and equal access to ensure all stakeholders are exposed to the best materials and brightest minds across the state. Steps have already been taken to address shortcomings regarding STEM resources. The Maryland State Department of Education established an Office of STEM Initiatives through Race to the Top funding which helps to develop high-quality STEM resources and train teachers and administrators on the effective implementation of these resources.

Equity: Equity in STEM education is not same as equality in STEM education. Equitable access is not the same as equal access. In order to achieve STEM academic equity in Maryland, educators and learners must recognize and believe that STEM academic achievement is attainable by each learner regardless of race, gender or other demographic attributes; and that an equitable increase in evidence-based strategies and opportunities for all learners to develop STEM proficiencies, skills, and knowledge must occur.

Student STEM learning experiences: To fully provide STEM education, Maryland's students need the opportunity to integrate discovery and innovation into their learning. Real world experiences strengthen students' skills and provide a bridge between academic experiences and career applications. According to the Governor's STEM Task Force Report, one of the primary goals identified is to "provide STEM internships, co-ops, or lab experiences for all interested high school and college students to jump-start their successful transition to the workplace." Even for students not headed into STEM careers, authentic STEM learning experiences can help students connect STEM learning to their everyday lives and futures.

Communications: What is needed in Maryland is a mechanism that enhances communications across all stakeholders. The Maryland State Department of Education (MSDE) is rising to the challenge of improving statewide STEM education communication because of the relevance of STEM to all individuals. To meet the recommendations of the Governor's STEM Task Force, it is essential to encourage and develop a cultural shift in the perception of STEM so that everyone is STEM proficient and to ensure that the various STEM stakeholders have the understanding that STEM skills are a gateway for entering the workforce and developing financial and future success. In addition, because STEM education has the potential to foster and promote unified communities through common goals and problem solving abilities, this too should be successfully communicated throughout the state.

Five focus areas of the Maryland STEM education strategic plan

Focus Area	Goal Statement
Professional learning	Equip educators with skills and tools for learning that create and/or enhance their capacity to offer high quality STEM instruction for all students.
STEM resources	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.
Equity	Promote equity in STEM education by providing access to effective evidence-based strategies.
Student STEM learning experiences	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.
Communication	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.

Descriptions of Five Focus Areas

Professional learning: Providing educators with understanding and tools for learning can enhance their capacity to offer high quality STEM instruction for all students. Interfacing with educators and stakeholders around the state has uncovered gaps in understanding about STEM education, specifically, what it is, why it is important, and how it can be implemented as a regular part of daily instruction. These gaps in knowledge and/or skills can be addressed through professional learning targeted towards building teachers’ STEM content and pedagogical knowledge, increase abilities to create integrated STEM activities, and find ways to collaborate with each other.

STEM resources: Preparing today’s students for tomorrow’s workforce is a complex task and can be enhanced by providing access to high-quality resources. Maryland is rich in STEM resources, but there lacks common criteria to determine the quality of resources, shared metrics to determine the effectiveness of resources, and equal access to ensure all stakeholders are exposed to the best materials and brightest minds across the state. Steps have already been taken to address shortcomings regarding STEM resources. The Maryland State Department of Education established an Office of STEM Initiatives through Race to the Top funding which helps to develop high-quality STEM resources and train teachers and administrators on the effective implementation of these resources.

Equity: Equity in STEM education is not same as equality in STEM education. Equitable access is not the same as equal access. In order to achieve STEM academic equity in Maryland, educators and learners must recognize and believe that STEM academic achievement is attainable by each learner regardless of race, gender or other demographic attributes; and that an equitable increase in evidence-based strategies and opportunities for all learners to develop STEM proficiencies, skills, and knowledge must occur.

Student STEM learning experiences: To fully provide STEM education, Maryland's students need the opportunity to integrate discovery and innovation into their learning. Real world experiences strengthen students' skills and provide a bridge between academic experiences and career applications. According to the Governor's STEM Task Force Report, one of the primary goals identified is to "provide STEM internships, co-ops, or lab experiences for all interested high school and college students to jump-start their successful transition to the workplace." Even for students not headed into STEM careers, authentic STEM learning experiences can help students connect STEM learning to their everyday lives and futures.

Communications: What is needed in Maryland is a mechanism that enhances communications across all stakeholders. The Maryland State Department of Education (MSDE) is rising to the challenge of improving statewide STEM education communication because of the relevance of STEM to all individuals. To meet the recommendations of the Governor's STEM Task Force, it is essential to encourage and develop a cultural shift in the perception of STEM so that everyone is STEM proficient and to ensure that the various STEM stakeholders have the understanding that STEM skills are a gateway for entering the workforce and developing financial and future success. In addition, because STEM education has the potential to foster and promote unified communities through common goals and problem solving abilities, this too should be successfully communicated throughout the state.