

OHIO **STEM**
ADVOCACY KIT

FEBRUARY 2012

Dear **STEM** Advocate,

You know how important STEM education is to the future of Ohio. These materials have been developed to help you tell the story of STEM and OSLN in your city, county and region. Please use this information to reach parents, students, educators, higher education leaders, business leaders, community leaders, media partners and all other STEM stakeholders.

You are encouraged to personalize and duplicate the materials in this toolkit, as needed, to help you spread the word and equip other advocates to share their perspectives about STEM education.

If there are additional resources that would be helpful to your efforts, please contact Ann Mulvany, Communications Director, Battelle STEM Innovation Networks, at mulvanya-c@battelle.org or 614-424-5827.

Thank you for your commitment to ensuring that STEM education remains a priority in Ohio.

Best regards,

David Burns

Executive Director
Battelle STEM Innovation Networks

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OVERVIEW & TOP-LINE MESSAGING

Goal

To support the advocacy effort of promoting STEM education as critical to Ohio's future.

Objective

Create a climate of public opinion that strengthens levels of support among Ohioans for continued STEM education investments, which are necessary for our state's prosperous future.

Strategies & Key Messages

Promote STEM education as a key strategy for workforce development. STEM will increase the state's creative and innovative capacity and stimulate economic growth.

- STEM is a direct response to the realization that Ohio's future will be built on technological leadership, knowledge creation and innovation. STEM education produces exactly the kind of thinkers such a world demands. A globally competent workforce will attract investment and jobs, which in turn attracts world-class talent.

Clarify what STEM education is and what it isn't.

- Many Ohioans still think STEM education is entirely about science, technology, engineering and mathematics. We need to help people understand that STEM is more than an acronym - it's a philosophy for teaching and learning, a transformative public-private approach to education that uniquely engages formal and informal partners from K-12, higher education and business.
- We need to communicate that STEM education is a logical response to a changing world, a new way of teaching and learning for all students and an approach to developing the creative, critical-thinking and problem-solving skills that all students need to be successful in today's world.

Highlight the importance of committed, engaged community partners who are willing to leverage their own resources to support the development of STEM education.

- We must convey that dozens of national, state, regional and local partners have committed time and money to support STEM schools in Ohio. The magnitude of this support is a powerful testament to the value these partners place on having a STEM-literate workforce.

Emphasize that the STEM education footprint in Ohio is large and provides broad public benefit.

- One key to securing support for sustained state investment in STEM is our ability to help state legislators understand that the impact of STEM education will be substantial and far-reaching. We must communicate the structure of OSLN, especially the concept of Regional STEM Innovation Hubs, STEM Platform Schools and Regional STEM Training Centers, which broadly share curriculum, best practices, teacher professional development and more with other schools across the state. These roles and relationships demonstrate that Ohio's STEM infrastructure is strategically designed to touch the lives of all of Ohio's students.

Characterize difficult economic conditions as a rationale for protecting the state's investment in STEM education.

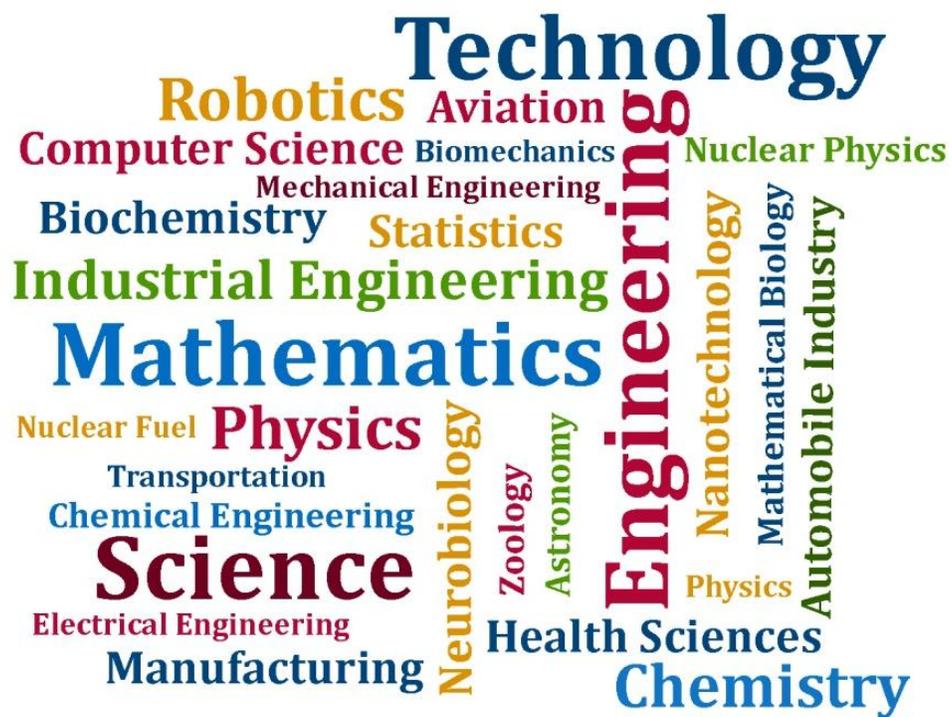
- In difficult economic times, strategic resource allocation is more important than ever. Because STEM education is a critical strategy for achieving economic success in Ohio, it is logical to continue to build on past STEM educational investments to ensure that Ohio reaps the full benefits of those investments.

Leverage Ohio's national leadership in STEM initiatives.

- Ohio is rich in STEM resources, from heavy industry and agriculture to a robust automotive sector, deep healthcare experience, logistics genius and internationally recognized research organizations such as The Ohio State University and the Battelle Memorial Institute. We must communicate that Ohio is and has been "ahead of the curve" in STEM education, which well positions Ohio to create competitive advantage and drive economic growth in the state.

Put a human face on STEM education.

- STEM education is about investing in our children - our current and future workforce - the innovators, problem-solvers and thought leaders who are critical to the future success of our state and nation. We must tell the stories of those who benefit from and believe in STEM education - from students, parents and educators to business and community leaders and other "expert" professionals who can speak to the value of STEM education.



NATIONAL AND STATE STEM LANDSCAPE

STEM is everywhere around us and STEM professionals impact nearly every aspect of our lives. They invent our medicines and smart phones, engineer our planes and bridges and design the architecture of our buildings and the Internet - all developments that have forever changed our world.

STEM literacy is a foundational skill that is important for all careers, not just STEM-related fields. STEM prepares students to be critical and creative thinkers, innovators, problem solvers, collaborators, team players and strong communicators. To put it simply, STEM students are better prepared to tackle the challenges of a fiercely competitive and constantly changing 21st century economy.

STEM education is one of the most effective tools we have to prepare students for success in college and the workforce that awaits them. At its core, STEM is focused on building critical and creative thinking and analytical skills by addressing how students view and experience the world around them.

Strong STEM teaching and learning rest on:

- Inquiry-, technology- and project-based learning that is tied to the real world;
- Diverse, interdisciplinary curriculum where activities in one class complement those in other classes;
- Robust partnerships that reach beyond the walls of the classroom to include higher education, business and the community; and
- Strong school leaders who understand the STEM approach and harness its power to transform education in their schools.

Today's students - Ohio's future workforce - must be comfortable with ideas and abstractions and competent in analysis and synthesis. STEM literacy and proficiency provide the foundation for these skills and help students build the flexibility to adapt quickly to changes in the labor market caused by frequent global shifts.

HISTORY OF THE OHIO STEM LEARNING NETWORK

In 2007, Battelle partnered with The Ohio State University and KnowledgeWorks to open Ohio's first STEM School - Metro Early College High School in Columbus, a bold and imaginative design that set the standard for STEM programs, both in Ohio and across the country.

This prompted Governor Ted Strickland to sign H.B.119, which allocated an unprecedented \$13 million to establish STEM schools and programs in Ohio. Inspired by the governor's support, the Bill & Melinda Gates Foundation awarded a \$12 million grant to create a sophisticated, yet elegantly simple network of STEM hubs, platform schools and programs to infuse STEM literacy and disseminate knowledge throughout the state.

In January of 2008, the Ohio Business Roundtable, Battelle and the Bill & Melinda Gates Foundation joined with the governor and state legislators on Metro's campus to announce the creation of OSLN. In September, the Cleveland Metropolitan School District opened two STEM schools, MC2 STEM High School and Design Lab Early College High School.

The Roundtable and its partners also helped secure \$200 million to fund college scholarships for aspiring STEM majors, research grants for STEM college faculty, training and professional development for STEM classroom teachers, planning grants and support for new STEM schools and programs.

The following year, Governor Strickland allocated \$10 million for STEM initiatives, and a second round of H.B.119 funding provided support for a total of eight STEM schools and 26 K-8 STEM Programs of Excellence. The network grew to include five new STEM schools: the National Inventor's Hall of Fame School, Dayton Regional STEM School, Hughes STEM High School, Linden McKinley STEM Academy and New Miami STEM School.

In 2010, OSLN established five regional STEM innovation hubs - in Akron, Central Ohio, Northeast Ohio, Dayton and Southwest Ohio - to support the STEM platform schools in those regions. Two new schools were added to the network, the Reynoldsburg eSTEM Academy and Perkins Local Schools, bringing OSLN's total number of STEM schools to 10.

The success and rapid growth of OSLN led the Bill & Melinda Gates Foundation and Battelle to mobilize STEM networks in four additional states in 2011: California, New York, North Carolina and Texas.

OSLN also supported Tennessee in the development of its own STEM network, the Tennessee STEM Innovation Network, and helped them win one of the first Race to the Top grants from the U.S. Department of Education.

Ohio also won a Race to the Top grant to continue its educational reform activity and establish two more regional hubs in Northwest and Southeast Ohio.

By 2012, the majority of OSLN's STEM schools had been operational for a few years and some had graduated as many as three classes of students and shown significant results in student outcomes and learning. It is because of these outcomes that OSLN and its hubs are equipping and developing Regional STEM Training Centers across the state.

The goal of the training centers is to focus and spread STEM effective practices that have yielded the most sustainable results within the STEM platform schools. No two schools are the same and neither are any two training centers. Each training center is designed to highlight the strengths of the STEM platform schools in that region and provide a vehicle to spread these practices across the region and state.

STRUCTURE OF THE OHIO STEM LEARNING NETWORK

OSLN supports the growth and quality of STEM education in Ohio by:

- Connecting the best STEM schools, teachers and administrators to each other and to national resources;
- Assisting schools and communities that want to create new STEM schools and programs; and
- Driving STEM innovations through a network approach.

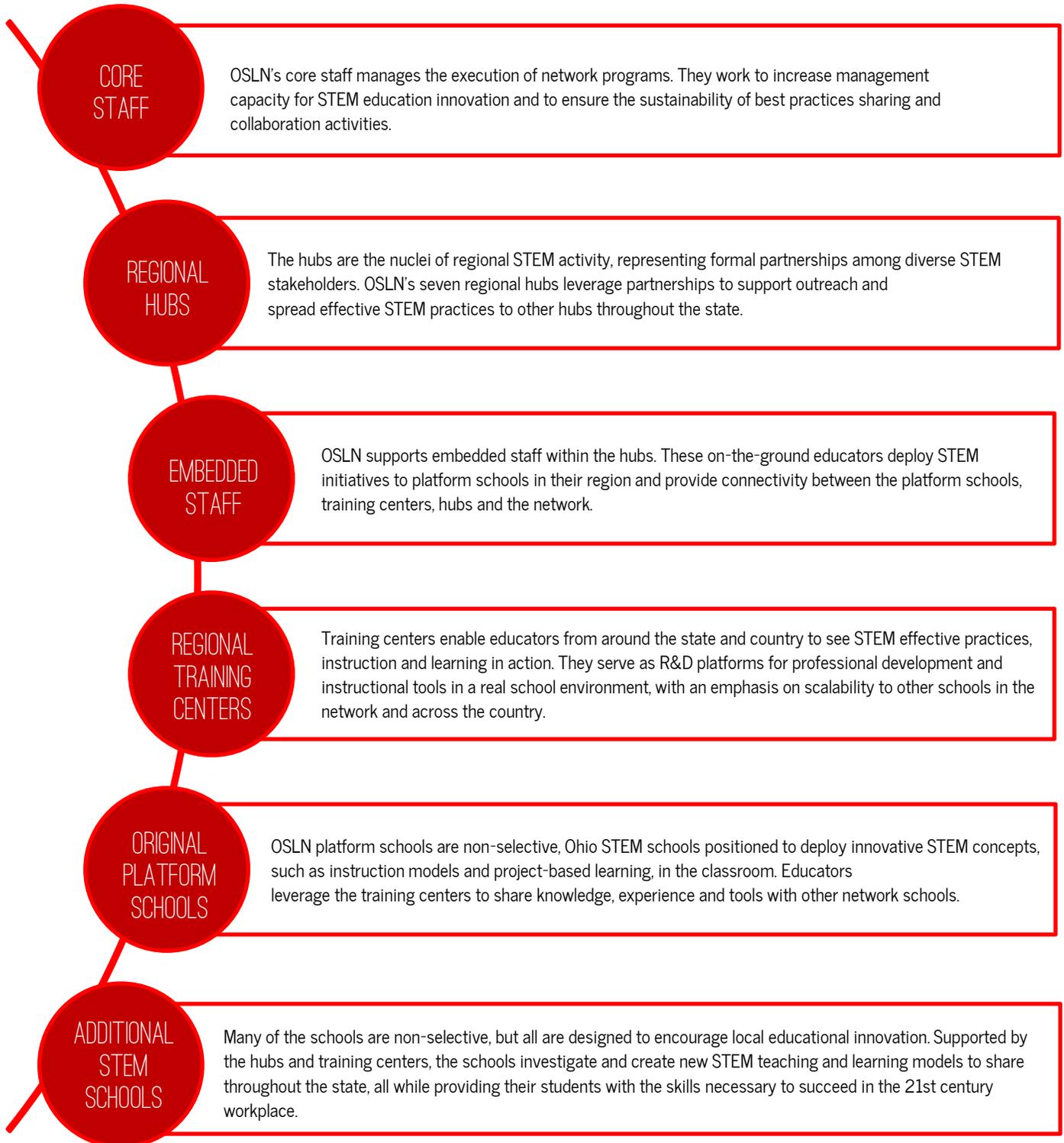
Ohio is rich in STEM resources, including heavy industry and agriculture, a robust automotive sector, deep healthcare experience, logistics genius, entrepreneurship, higher education and internationally recognized research institutions. The goal of OSLN is to leverage these resources - the knowledge, skill, and acumen of Ohio's K-12, higher education, business and community partners - to amplify opportunities for all students.

Ohio needs qualified workers to fill exciting STEM jobs, but STEM education is about more than just workforce development. It is also about inspiring the next generation of leaders to help solidify Ohio's future as a leader in the global STEM marketplace. When fully realized, OSLN will have an impact on students across the entire state. Whether urban or rural, experienced or inexperienced, every child deserves to have access to a quality STEM education.

At the heart of OSLN is a community of committed educators and partners who believe in the concept of STEM for all and work to make it a reality.

There are six main components that combine to form the Ohio STEM Learning Network:

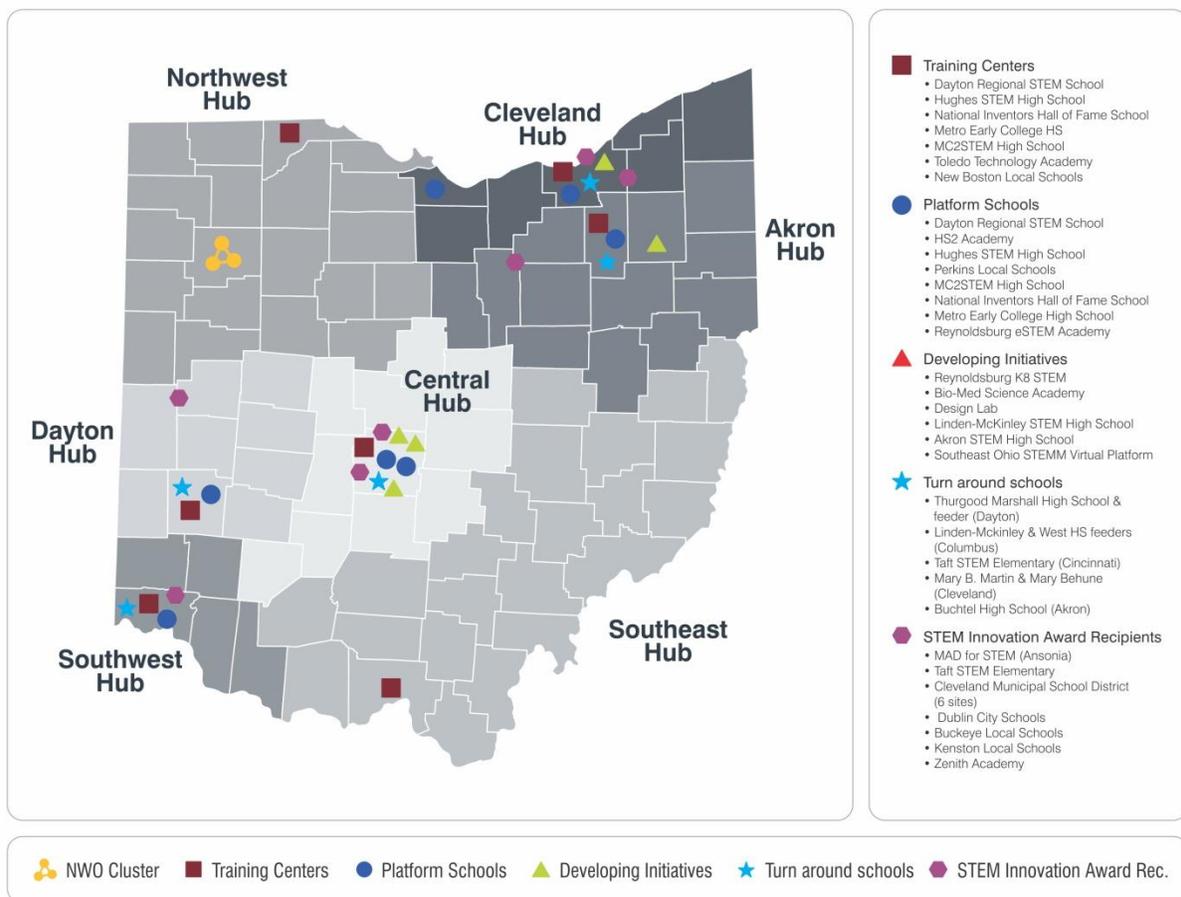
- Core staff
- Regional STEM hubs
- Embedded staff
- Regional STEM training centers
- Original STEM platform schools
- Additional STEM schools



WHAT DOES THE STEM NETWORK LOOK LIKE TODAY?

The past year has marked a period of transformation for OSLN as it transitions from a network that not only assists in starting up STEM schools and programs, but one that leverages existing STEM schools and programs to spread effective practices and tools.

Today, OSLN consists of numerous STEM Platform Schools and seven Regional STEM Training Centers, which are spread throughout the seven Regional STEM Hubs.

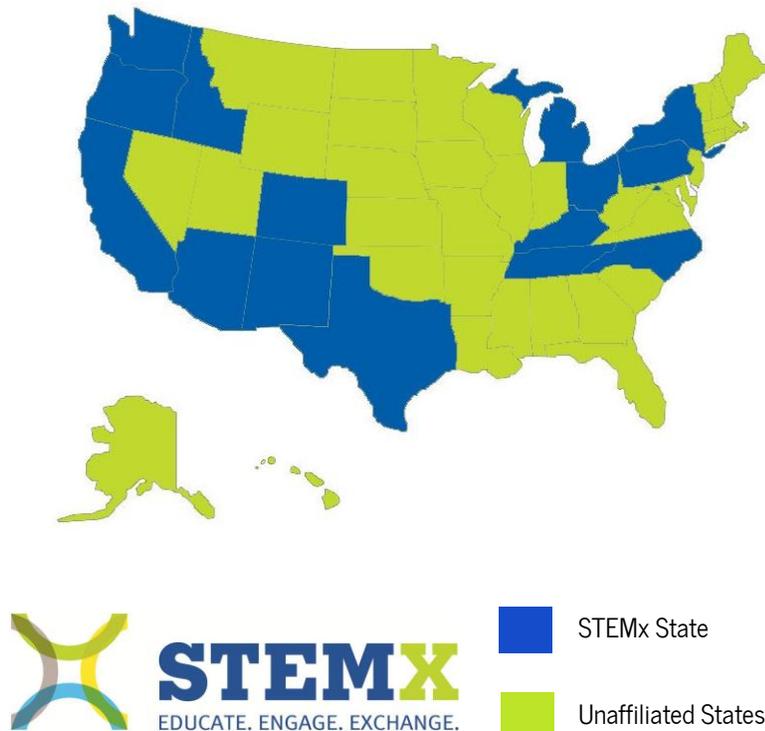


ABOUT STEMX

STEMx is a grassroots movement that provides an accessible platform to share, analyze and disseminate quality STEM tools to transform education, expand the number of STEM teachers, increase student achievement in STEM and grow tomorrow's innovators. It is a national STEM network that encourages communication, collaboration and community among STEM professionals and practitioners.

In addition to being a STEMx member state, Ohio is represented on the STEMx Network Council by the Ohio STEM Learning Network.

Through STEMx and OSLN, Ohio can benefit from the STEM learning happening in state STEM networks across the country. Ohio's locally developed best practices can also have an impact on students from coast to coast. STEMx gives Ohio a national platform to effect change and share its accomplishments in STEM.



TALKING POINTS FOR STEM ADVOCATES

Students and Parents

Talk about how STEM education has helped you (or your child) perform better in school, and/or how STEM is helping to prepare you (or your child) for a successful future. Consider emphasizing points such as these:

- STEM education is more motivating and challenging than traditional school experiences - it makes school more interesting and relevant to the real world.
- STEM education allows students to take more control over their learning - to personalize education with learning experiences tied to students' personal interests and abilities.
- STEM education prepares students for success in college, careers and citizenship by providing early college experiences and opportunities for internships and mentoring with local employers.
- STEM education develops the skills students need to compete in the global economy - such as creativity, critical thinking, research, teamwork and communication.
- STEM education is a doorway to opportunity in exciting, challenging and financially rewarding careers.

TALKING POINTS FOR STEM ADVOCATES

Educators

Talk about how STEM education is more than just an acronym - how it's a new approach to teaching and learning designed to prepare students for success in a globally competitive, technology-driven world that values and rewards innovative thinking and creative problem solving. Consider emphasizing points such as these:

- STEM education is the logical next step for Ohio's continuing efforts to provide quality educational experiences to all students because it emphasizes a rigorous curriculum, project- and performance-based learning and linkages to real-world problems and applications. It also moves beyond an emphasis on simple test performance to focus instead on developing higher-level thinking skills like problem-solving.
- STEM education is designed to develop "the whole child" by integrating different subject areas in cross-disciplinary learning experiences and fostering both creativity and critical thinking.
- STEM education reflects an understanding that not all students learn in the same way and thus places a strong emphasis on providing highly personalized educational experience to suit a variety of student learning styles, needs and interests.
- STEM for All. STEM education is for all students - not just above-average students or students planning to pursue a STEM degree - because it develops skills that are relevant to all fields of study and all careers.
- STEM education provides terrific opportunities for students to see direct connections between what they learn in school and what will be required of them in college, in the workplace and in the world as responsible citizens.

TALKING POINTS FOR STEM ADVOCATES

Employers and Community Leaders

Talk about how STEM education is key to competing and prospering in today's global economy - and about how talent development is critical to attracting investment and jobs. Consider emphasizing points such as these:

- STEM education is key to developing the highly skilled and motivated workforce that Ohio businesses need to succeed in a fiercely competitive global economy.
- STEM education is designed to produce the kind of creative, critical thinkers who can work effectively in teams, critically evaluate complex problems and design creative, innovative solutions to problems.
- STEM education will help ensure Ohio has a deep talent pool that will attract continued business investment, economic growth and high-wage jobs.
- STEM education provides an opportunity for businesses to help close the gap between educational preparation and workplace requirements - by engaging businesses as active partners in designing curriculum, providing job-site experiences, mentoring and developing workers prepared for the realities of the workplace.
- STEM education should continue to be an investment priority for Ohio. In tough economic times, successful organizations continue to invest in areas of strategic priority - and STEM is key to Ohio's competitiveness in global markets.

STEM FAQ

What is STEM Education?

STEM stands for science, technology, engineering and mathematics, but it is far more than just an acronym. While originally designed to encourage more students to pursue careers in these specific areas, STEM education has evolved into a unique approach to teaching and learning that fosters creativity and innovative thinking in all students. STEM education is a direct response to the realization that other states and nations are gaining competitive advantage by asserting their scientific and technological leadership, and that Ohio's future will be built on its own capacity for innovation, invention and creative problem solving. STEM education produces exactly the kind of thinkers, innovators and problem solvers such a world demands.

How is STEM education different from a traditional approach to education?

STEM schools are centers of creativity and innovation that provide challenging, student-centered, inquiry-based educational experiences that are cross-disciplinary in nature and relevant to the real world. Unlike traditional school experiences in which different subject areas are treated as separate "silos," STEM education emphasizes the technological design process and integrates subjects in ways that emphasize connections across disciplines. In a STEM classroom, students develop analytical and creative skills through investigation and problem solving. STEM moves beyond an emphasis on simple test performance and focuses instead on developing higher-level thinking skills.

STEM education also typically features strong levels of collaboration among education, business and community partners to help develop relevant curriculum and provide internships, mentorships and cooperative education opportunities to help students connect classroom learning to the real world.

Is it true that STEM education is only for a small, select number of students interested in careers in math and science fields?

Not at all. While increasing the number of young people who choose careers in STEM fields is certainly one objective driving STEM education, it is only part of the story. STEM education develops skills that have a much broader application. STEM education emphasizes collaboration, communication, research, problem solving, critical thinking and creativity - skills that all students must have to be successful in today's world, no matter their specific interests or career goals. STEM education also places a strong emphasis on personalizing

educational experiences to best suit students' individual learning styles and interests, which means STEM education has something to offer to every student. This is why OSLN emphasizes the importance of "STEM for All."

How will students who do not attend designated STEM schools benefit from the state's investment in STEM education?

As Ohio's STEM schools and their supporting hubs continue to grow, the benefits of STEM education will reach more and more students - whether they attend a STEM school or a traditional school. Through their open platform design, STEM schools are created to have a large footprint through the broad sharing of curriculum and teacher professional development. This sharing concept is magnified when schools and partners connect to the Ohio STEM Learning Network and begin sharing state-wide.

How does STEM education benefit Ohio?

STEM education is really about developing globally competent talent. As such, STEM education is a key strategy for Ohio's economic success - for stimulating economic development in our state and creating economic opportunity for our citizens. A STEM-literate workforce will attract investment and jobs, and good jobs and economic opportunity will attract and retain world-class talent. More specifically, the development of Ohio's growing network of STEM schools is driven by, and linked to, regional economic strengths and workforce needs. Business, informal education and community partners play a vital role in helping to ensure that STEM learning experiences develop the highly skilled workers that local and regional employers need to compete globally.

To what degree have partners, including the private sector, provided financial support for STEM education?

Many private-sector companies in Ohio have made significant investments in STEM education - demonstrating the value they place on ensuring a STEM-literate workforce will be available to help them compete globally.

STEM EDUCATION IS ...

- A teaching philosophy that fosters creativity and innovation in Ohio's students. STEM schools are centers of creativity and innovation that provide challenging, student-centered and inquiry-based educational experiences. Unlike traditional curriculum, STEM education teaches students to integrate skills from different subject areas to help them develop innovative solutions to real-world problems.
- Designed to prepare students for success in college, careers and to be responsible citizens. STEM education develops Ohio's students' creative, analytical, teamwork, communication and problem-solving skills - all essential to success in today's world.
- A direct response to the realization that Ohio's future will be built on technological leadership, knowledge creation and innovation. Ohio, along with the rest of the nation, has fallen behind in the global market as other states and nations have gained competitive advantage by asserting their scientific and technological leadership. STEM elevates Ohio's position in the global economy and gives our students the skills they need to successfully compete with talent from around the world.
- Key to Ohio's economic future. STEM education unleashes students' creativity and gives them the skills needed to conceive and develop the revolutionary products and processes that will shape Ohio's economic future. A STEM-literate workforce will attract investment and jobs to Ohio, while good jobs and economic opportunity will attract world-class talent.

STEM EDUCATION IS NOT ...

- Only for an elite group of students. When fully realized, STEM will serve all students across Ohio and the nation.
- Only for those interested in science, engineering, technology or math. STEM education goes beyond training scientists, engineers and technologists. It helps all students develop and apply essential skills through a rigorous and diverse curriculum, a college- and work-ready culture, personalized learning opportunities and a top-flight teaching force. These skills will serve students in all areas of their future education and careers.
- Beneficial only to those enrolled in STEM schools. All students benefit from a strong STEM infrastructure. STEM schools share curricular and teacher professional development tools and best practices state-wide, impacting surrounding traditional schools. Furthermore, regional STEM training centers will develop STEM curriculum and instructional tools, train STEM teachers, share STEM best practices and provide STEM distance-learning experiences for students across the state.
- One-size-fits-all. STEM is highly personalized education that meets students where they are and caters to students' individual learning styles and interests through individual student and faculty interaction. STEM students have the opportunity to build upon their strengths and learn in ways that are most meaningful and beneficial to them. Students are active in internships and are often earning college credit while still in high school.

SAMPLE LETTERS

A few samples letters are included below for your reference. As you write letters to key audience members to advocate on behalf of STEM education, keep these tips in mind.

- Be brief and specific with your requests. Legislators and business leaders especially like to hear concrete examples of how they can support STEM and how STEM can impact their constituents and companies.
- Letters should be written in your own words, but may be informed by the talking points in this document. Use statistics, but also explain how STEM education touches your life (or your child's life), personally.
- Sign your letters and include your contact information in case your recipient wants to learn more.

Consider reaching out to the following audiences:

- Business leaders
- Legislators
- Newspapers
- Community partners (e.g. Rotary, Girl Scouts, science museums.)

SAMPLE LETTER TO BUSINESS AUDIENCE

[DATE]

[FIRST NAME, LAST NAME]

[ADDRESS]

Dear [Mr./Ms. LAST NAME]:

As our economy becomes increasingly globalized and competitive, please consider the role that STEM education can play in creating a deep talent pool here in our home state.

As you may know, STEM stands for science, technology, engineering and mathematics. But STEM is more than an acronym - it's a philosophy for teaching and learning, a transformative public-private approach to education that uniquely engages formal and informal partners from K-12, higher education and business. STEM is project-based, collaborative and focused on solving real-world problems.

Ohio's future will be built on technological leadership, knowledge creation and innovation. In my experience, STEM education produces exactly the kind of thinkers such a world demands.

Please consider [INSERT YOUR REQUEST, BORROW FROM EMPLOYER TALKING POINTS].

Sincerely,

[YOUR NAME]

[ADDRESS]

[CONTACT INFORMATION]

SAMPLE LETTER TO LEGISLATIVE AUDIENCE

[DATE]

The Honorable [FIRST NAME, LAST NAME]

[ADDRESS]

Dear [Representative/Senator] [LAST NAME]:

As you and your fellow [representatives/senators] discuss how to improve our great state, please consider the role that STEM education can play in securing a sound financial future for all Ohioans.

As you may know, STEM stands for science, technology, engineering and mathematics. But STEM is more than an acronym - it's a philosophy for teaching and learning, a transformative public-private approach to education that uniquely engages formal and informal partners from K-12, higher education and business. STEM is a way of teaching and learning that is project-based, collaborative and focused on solving real-world problems. Ohio's future will be built on technological leadership, knowledge creation and innovation. STEM education produces exactly the kind of thinkers such a world demands.

I know firsthand the potential impact of STEM education in our state. [INSERT A FEW SENTENCES ABOUT YOUR PERSONAL STORY/PERSPECTIVE]

As you evaluate your budget choices, please consider [INSERT YOUR REQUEST].

Sincerely,

[YOUR NAME]

[ADDRESS]

[CONTACT INFORMATION]

For more information about the

OHIO STEM
ADVOCACY KIT

Contact us at OSLN@battelle.org