



STEM Centers SC

Solutions in Science, Technology, Engineering & Mathematics Education

TOTAL INSTRUCTIONAL FOCUS: NETWORK OF INSTRUCTIONAL SUPPORT

A network of instructional support in STEM education is a system facilitated by knowledgeable leaders, who lead the school community in acquiring and maintaining resources and maximizing learning time for all STEM instruction whether tested or not.

Instructional Leaders

Instructional leaders in STEM schools engage in their own professional learning to stay abreast of current research on STEM education. This gives them greater proficiency in creating the school conditions that support STEM learning. The National Research Council's report, *Successful K-12 STEM Education: Identifying Effective Approaches in Science, Technology, Engineering, and Mathematics*, suggests that school leadership is the driver for change. The report states, "Principals must be strategic, focused on instruction, and inclusive of others in the leadership work." Coordinating a network of instructional support that includes all stakeholders is among the multiple facets of leadership in a STEM school.

Assessing Needs - Providing Access

Guided by the school's vision and goals for STEM education the school sets priorities for fulfilling its STEM resource needs. The collective responsibilities of the network include recruitment of teachers qualified to teach a STEM curriculum, along with the acquisition and maintenance of resources vital to support STEM instruction. These include time, materials, facilities, technology, professional learning, and human resources.

A school needs assessment should be conducted to ascertain STEM teaching and learning needs. The analysis should address questions such as:

- How might we equip our classrooms, labs, media centers and common spaces for 21st century individual and collaborative learning?
- In what ways does our technology plan reflect the needs of learners in a digital age?
- What essential materials and supplies might we provide to support teaching and learning the STEM curriculum?
- How might we meet unique learning needs of individuals in the STEM school community, including students, staff and parents?
- What resources will enable our school to better serve the surrounding community, including businesses, institutions of higher learning and community organizations?
- In what ways can we leverage community resources to meet the school's needs?

The answers to these questions and others will guide school actions and should be clarified through a collaborative decision-making process that engages the full school community. The effective STEM school community is diligent in its efforts to gain and facilitate the purposeful use of essential resources that support the success of all students in achieving STEM goals.

Maximize Learning Time

A typical school day is 6 – 7 hours in length; therefore, the resource of time must be strategically managed. STEM schools value all content areas, those tested by the state and those not, and use creative strategies to maximize instructional time in all classes. The National Center on Time and Learning (NCTL) puts forth, “Every child in America deserves an education that prepares them for success in college and careers and a rich, fulfilling life. Unfortunately, our antiquated school calendar is too limiting to provide millions of children with the breadth and depth of educational experiences they will need to thrive.” NCTL proposes strategies that expand the traditional school day to provide for greater depth of learning in core classes and enrichment in the arts and sports.

There are some promising strategies that maximize instructional time without adding to the school day. “Flipping” the classroom is an example. In this practice, students begin their learning at home where they view videos made by their teachers and take notes on knowledge level concepts. During class, with their teacher’s guidance, students utilize those concepts, in collaboration with peers, to solve problems and design innovations. The STEM school community thinks and acts outside of the box to ensure the effective and efficient use of time as an instructional resource.

Thriving STEM schools are guided by a collaboratively developed strategic plan. Insightful leaders work with all stakeholders to form a network that fully supports every aspect of STEM instruction.

Bibliography

National Research Council of the National Academies. Successful K-12 STEM Education: Identifying Effective Approaches in Science, Technology, Engineering, and Mathematics .2011. National Academies Press Washington DC. www.nap.edu Accessed August, 2012

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Guiding Questions

Use the reflection questions below to guide discussions. We recommend documenting evidence to support each question. Doing so will assist you in setting action plans, goals, and progress monitoring.

Instructional Leaders

- What are some ways leaders at your school create conditions that support STEM learning?
- What are some ways the school principal is inclusive of others in her/his leadership work?
- How do administrators recruit teachers qualified to teach STEM curriculum?
- What processes and procedures are in place to acquire and maintain assets vital to STEM instruction?
- How do leaders at your school engage in their own professional learning to stay abreast of current research on STEM education?

Assessing Needs; Providing Access

- What collaborative decision-making process does your school use? How does this collaborative decision-making process engage the full school community?
- What are some ways you ensure community understanding of the school's vision and goals for STEM education?
- How are you ensuring that your school community has the essential materials and supplies to support teaching and learning the STEM curriculum?
- How are classrooms, labs, media centers, and common spaces equipped for collaborative learning? For individual learning?
- How does your technology plan reflect the needs of learners?
- What materials and supplies are essential to support teaching and learning STEM curriculum?
- How are unique learning needs of students, staff, parents and other individuals in the STEM school community met?
- What resources will enable our school to better serve businesses, institutions of higher learning, and community organizations?
- How might we better leverage community resources to meet the school's needs?

Maximize Learning Time

- What strategies are employed to maximize instructional time in *all* classes?
- In what ways do school leaders work collaboratively with the school community to put forth ideas that lead to equitable learning time?
- In what ways are teachers encouraged to practice innovative approaches that maximize instructional time?