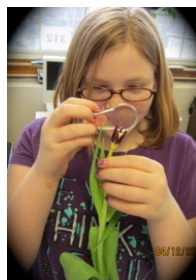




Knowledge in Use - with **STEM**



Photos by Mary Dunn

State and nationwide there is a call for stronger learning opportunities in science, technology, engineering and math (STEM). The Maine Department of Education's web site states:

Greater access to quality STEM teaching and learning can positively impact student career options and personal and civic decision-making, and give students a vital role in strengthening Maine's economy...

In the next decade, one in seven new Maine jobs will be in STEM related areas, with wages 58% higher than wages in other occupations. Nationwide, it is expected that the demand for employees to fill STEM-related jobs will grow by 22 percent in the next four years.

Even at present, jobs that require STEM skills are going unfilled. Yet segments of our Maine and United States population have gone untapped for STEM related careers. For instance, fewer than 10 percent of U.S. engineers are female, even though women constitute almost half the nation's labor force (Tucker, 2013).

Continued on page 2

SAVE THE DATE!

HEIDI HAYES JACOBS

*Curriculum 21: Essential
Education for a Changing World*

Dr. Heidi Hayes Jacobs, will engage you in transforming your school and classroom into a contemporary learning environment based on her best-selling book: **Curriculum 21: Essential Education for a Changing World** (ASCD) and her soon to be released: **Leading the New Literacies: Digital, Media, and Global** (Solution-Tree).

Where: Ramada Conference Center
Lewiston, Maine

When: October 28, 2013

Time: 9:00-3:00

STEM, continued

Next Generation Science Standards. Maine is a Lead State Partner with *Next Generation Science Standards*, which were finalized this spring. The standards were developed by a coalition of 26 states and national organizations, including the National Science Teachers Association (NSTA).

Next Generation standards include performance expectations in which students show their learning with demonstrations and products. For example, students are required to plan and conduct investigations, make observations, analyze data, and devise models. The standards require deep knowledge of core concepts and cover fewer topics. The science and engineering practices in the new science standards dovetail with the practices and skills forwarded in the Common Core math and literacy standards.

Students learn Next Generation Science Standards within units of study that connect to science topics, for example, light, oceanography, energy, water quality, ecosystems, weather and climate and study them using *Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts*, such as patterns; energy and matter; and cause and effect that have applications across all domains of science (Next Generation Science Standards, 2013).

NSTA and Achieve are working with states to develop rubrics to assess units. Standardized assessments of students' achievement of the new science standards are yet to be developed.

Stephen L. Pruitt, a senior vice president of *Achieve*, the organization that managed the development of math, literacy and Next Generation Science standards advises districts to implement the new science standards gradually, moving at a deliberate pace and building the right infrastructure for success (Robelen, 2013, May 14). **Continued on page 3**

Teachers throughout Maine and beyond have already been bringing elements of *Next Generation* guidelines to their students' learning, for example:

- Helen Hurgin, Windham Middle School math and science teacher's students researched ways to reduce energy consumption and came up with plans for their school.
- Mary Finne more and John Sterling, for many years, have provided Skowhegan Area High School science students with a unit in which students are presented with scenarios from which they trace pollutants and other causes of illnesses and determine preventative measures.
- Rachel Frost, Messalonskee High School chemistry teacher's students use chemical reactions to create marketable products.
- Kendra Lakeman's and Jennifer Veilleux's, Augusta School Department, second grade students investigated the effects of sugar consumption on students' learning and shared their findings with the school community.
- Jessica Ward, Madison Memorial High School, biology teacher's students conducted research to learn how mercury content in Maine fish could be reduced without negative consequences to industries.
- Somerset Career and Technical Center's Information Systems Technology faculty provide units in which students program robots to perform activities.
- A teacher revamped a lesson on friction, and had students make evidence-based arguments about whether it was their friend or foe.
- A teacher's biology students analyzed the DNA of foods, including hot dogs and chicken nuggets.
- Students planted seeds, charted their growth and what factors supported and hindered it. They then gave their school principal ideas to help her home garden improve.

STEM Day at Albert S. Hall School, Waterville

On April 12, Hall School fourth and fifth grade students were treated to an entire day of hands-on STEM activities. Teachers Holly Trottier and Laurette Darling coordinated activities with the goal of aligning them to Next Generation Science Standards.

Students worked in small groups on activities such as:

- How could magnets be used to attract objects that aren't magnetic?
- What make an electrical current weaker?
- How does sound travel?
- What are properties that make slate a good roofing material?
- How can I design a paper airplane to land exactly where I want to go?
- Will small grain or large grain sand drain more quickly?
- What combination of alka seltzer and water and temperature of water will create the highest lift for a model rocket?
- How do flowers reproduce?

Presenters included engineers, Hall School teachers, Hall School math education technician, Hall School computer education technician, scientists, science museum educator, civil air patrol associate, Colby science professor, NASA teacher ambassador, University of Maine at Orono physics professor. Thomas College students, Colby College students, school principal and teachers assisted.

STEM, continued

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- Lee Anna Stirling



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Maine ASCD News

You are invited to submit a brief article (approximately 200-250 words) describing a strategy or program in your classroom, school or district. Provide your name, job title, school, district, your e-mail address and other contact information.

Themes for future issues are: *Health and Physical Education, Common Core State Standards, Evaluation of Teachers.*

E-mail articles to Lee Anna Stirling at leemandu@earthlink.net with **Maine ASCD News** in the subject line.

Your feedback and suggestions for *newsletter topics* also are welcome.

Editor/Design: Lee Anna Stirling

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