



Vol. 7 Issue #3

March 2015

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K-16 STEM in the NEWS**Annual Engineer For A Day Program Brings Engineering To Life**

As part of "Engineer's Week", 25 students from area high schools participated in the highly successful and twelfth annual "Engineer for a Day" program held last month at the Toledo engineering firm SSOE. What is unique about this program is that the different fields of engineering are explored by students in a day filled with interactive and engaging hands-on activities, all with the focus of exposing students to what it's really like to work as an engineer.

SSOE engineers take the students through fun experiments and projects, all in an effort to expose the students to what it's like to work as a team, putting into "action" how engineering may be applied in day-to-day activities. The day began with a demonstration of electrical engineering titled, "Let's Build a Motor", led by electrical engineer, John Colley, PE. This was followed by a presentation on computer engineering and the application of 3D technology and animation software in the engineering profession, led by SSOE's Director of Design Technology and Computer & Information Systems, Bill Case, and BIM/CAD Technical Leader Mark LaBell.



Students learned about the different software programs SSOE uses to create presentations for clients as well the important role that computer engineers play in the organization. SSOE presenters went on to discuss their roles within the company and answered questions from students on pursuing a career in the engineering fields. The day concluded with a hands-on activity to introduce structural engineering and the role of a project

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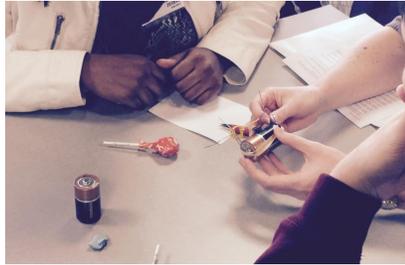
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manager. SSOE Structural Engineer, Kyle Bosworth led the activity titled, "Construct a Building Frame" which involved students working in teams to successfully construct a building frame out of household products. The students used their own creativity with various design options while managing a theoretical project budget and schedule.

During the program students also gained valuable knowledge about SSOE's student co-op / internship program. This popular program provides college students with resume building experience, a competitive wage, and college credits. On average SSOE employs 40 co-ops / interns at any given time.

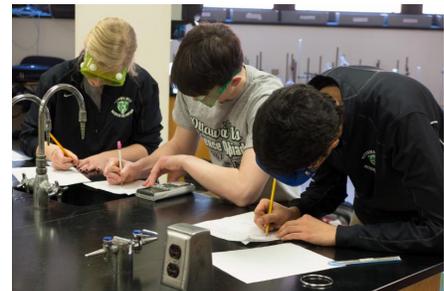


According to the SSOE website (www.ssoe.com), and the U.S. Bureau of Labor statistics, the field of engineering is expected to grow by 10 percent in the coming decade while a declining number of students are prepared for the rigorous coursework required to be successful. As the demand for engineers grows, SSOE is committed to preparing students for successful careers by generating interest and improving diversity in the STEM fields. In addition to their participation in the Engineer's Week program and co-op program, SSOE is a proud sponsor of the National Math and Science Initiative (NMSI), an organization with the mission of improving student performance in the critical STEM subjects.

Community STEM in the NEWS

Science Olympiad

BGSU hosted more than 400 middle school and high school students from 15 northwest Ohio counties on Feb. 28 in a Science Olympiad competition. Thirty teams competed in 38 categories ranging from "Air Trajectory and Bridge Building" to "GeoLogic Mapping" and "Wright Stuff." Events were held all day at various locations across campus, culminating in an awards ceremony. The local event is part of the national Science Olympiad, which began in an effort to encourage U.S. students in the sciences. Competitions are held in all 50 states and feature rigorous standards-based challenges in the STEM disciplines. Event categories are focused on three broad areas of science standards: Science Concepts and Knowledge, Science Processes and Inquiry Skills, and Science Application and Technology.



Schools which competed at BGSU were: Arlington, Gibsonburg, Montpelier, Northview, Oak Harbor, Ottawa

Hills, Ottawa-Glandorf, Paulding, Rossford, Springfield, St. John's Jesuit, St. Joseph, Sylvania Southview and Tinora. For the past 31 years, Science Olympiad has led a revolution in science education. According to the



Science Olympiad website, what began as a grassroots assembly of science teachers is now one of the premiere science competitions in the nation, providing rigorous, standards-based challenges to nearly 7,000 teams across the United States. Science Olympiad's ever-changing line-up of events in all STEM disciplines exposes students to practicing scientists and career choices, and energizes classroom teachers with a dynamic content experience.

Science Olympiad is a national non-profit organization dedicated to improving the quality of K-12 science education, increasing male, female and minority interest in the sciences, creating a technologically-literate workforce, and providing recognition for outstanding achievement by both students and teachers.

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STEM Opportunities



SATURDAY, APRIL 11, 2015

10 a.m. to 1 p.m.

Stroh Center, Bowling Green State University

Featuring Laura Numeroff, author of "If You Give a Mouse a Cookie," "If You Give A Pig a Pancake" and "If You Give a Moose a Muffin" series.

FREE FAMILY EVENT

- Enjoy a snack and literacy-based activities for the entire family

- Each family receives a goodie bag with a free book
- New exciting booths and activities
- Prizes and crafts

Save time the day of the event by pre-registering. Pre-registration is not required and does not guarantee a bag or book, as they are provided on a first-come, first-served basis.

For more information and to register, please visit: <http://www.bgsu.edu/events/literacy-in-the-park.html>



Are you a high school teacher who wants your students to master state science benchmarks? Do you want to gain a deeper understanding of core concepts and how to teach them in a meaningful and interesting way? If so, the 2015 STAMPS Modeling Institute at BGSU is the place to be!

Modeling Instruction is a nationally tested inquiry teaching style. It was developed at Arizona State University over two decades ago to integrate insights from physics education research with classroom experience of exceptional inservice teachers. In a series of workshops, teachers improve their science content knowledge and are equipped with a robust teaching methodology for developing student abilities to make sense of physical experience, understand scientific claims, articulate coherent opinions of their own and defend them with cogent arguments, evaluate evidence in support of justified belief. Modeling Instruction is a curriculum design, rather than a fixed curriculum, so teachers can flexibly adapt it to different courses and student abilities.

The Modeling Institute will be peer-led. Science content will be reorganized around basic models to increase its structural coherence. Participants will be supplied with a complete set of course materials and work through activities alternately in the roles of student or teacher, as they practice techniques of guided inquiry and cooperative learning.

Two week summer institutes offered for Physics and Chemistry and Biology. **Application deadline is March 31, 2015.** For more information: <http://cosmos.bgsu.edu/stamps/>

SATELLITES Geospatial Technology Institute

Studying Water Quality in the Great Lakes Watershed

July 27-July 31

8:00 am-5:00pm

The University of Toledo

Theme: The Health of the Great Lakes

Participants: 15 Teachers in grades 5-12 and Science Educators from the Great Lakes States

Cost: Free to attendants who participate completely in the workshop, the Field campaign, and the testing required of their students. Others attending will receive an invoice for the \$650.00 of equipment that will be given to the participants.

Attendants Receive: Over \$650 of equipment for water quality testing as well as a Remote Sensing instrument, a GPS, and access to GIS software. In addition, participants will receive numerous classroom resources on the Great Lakes, water quality work, and lesson plans.

Housing and Travel: The grant for this program cannot provide reimbursement for travel or housing. However, if you are interested, we can arrange for housing on campus in an air-conditioned dorm for approximately \$25.00 per night from Sunday through Thursday evening.

Institute: Attendees will receive training in the use of geospatial technologies as well as learning the GLOBE program hydrology protocols of water transparency, water temperature, dissolved oxygen, pH, alkalinity, nitrates and fresh water macro invertebrates.

If Interested: Contact Mikell Lynne Hedley at Mikell.hedley@utoledo.edu

Climate Hope Series

MAR 19
APR 27
2015



CLIMATE HOPE!

577 Foundation, Perrysburg

6:30 - 8:00 pm

\$10 per session [CEUs available]

Presented by: Jodi Haney, BGSU & Xcite Learning with Sam Evans, Maumee High School

Climate Change: It is real, it is bad, and it is us! And now for some good news ... we **CAN** do something about it! Join us in conversation and action planning! **HOPE IS HANDS ON!**

SAVE THESE DATES & TOPICS: Climate Change as related to:

March 19: Northwest Ohio Sustainable Energy

April 27: HOPE 4 Local Food (registration opens soon!)



Space is limited so **REGISTER TODAY** at www.577foundation.org
(go to Get Involved/Take A Class/Climate Hope)

BATTELLE Education - Innovative Leaders Institute Applications

Applications for 2015 Innovative Leaders Institute will open March 18. The year-long, hands-on institute for

educators trains leaders on creating innovative schools that work.

There is no cost for participants to attend the Innovative Leaders Institute thanks to generous funding from the [Ohio Department of Education](#).

[Click here](#) to receive the online application.

The BiG Fab Lab Is Officially Open For Business!

Be sure to check the website for upcoming classes and events at: <http://bigfablab.com>

The following tools are available, with more being added daily:

- 120W Laser Engraver
- CNC Router
- 3D Printer
- Design computers
- Basic hand tools
- Basic wood shop equipment
- Pottery wheels & electric kilns



Also available are rental spaces (short or long term), storage spaces for tools and projects, studio spaces (offices of various sizes, with locking doors), and large events room (includes kitchenette).

BiG Fab Lab is located in the Woodland Mall in Bowling Green, Ohio.

Tour Times are Monday - Friday: 2:00PM and 8:00PM, and Saturday: 2:00PM and 4:00PM.

Frank Thomas from Adaptive Corp. will demo the latest handheld 3D scanning technology from CREAFORM on **3/19/15 from 11:30AM to 1:30PM**. Registration fee is \$5.



NATIONAL COUNCIL OF
TEACHERS OF MATHEMATICS

The National Council of Teachers of Mathematics is accepting applications for its School In-Service Training

grants, which support the professional development and pedagogical content knowledge of math teachers in grades 9-12, as well as their knowledge of students as learners of mathematics.

For 2015 - 16, grants of up to \$4,000 will be awarded to elementary schools. Costs covered by the grants may include honoraria and expenses for consultants, materials, substitute time, and conference or workshop registrations. No funds may be used for staff travel or equipment. While the program does not fund the purchase of technology, proposals that include professional development involving the use of technology to enhance student learning are encouraged.

Only schools with a current (on or before April 24, 2015) individual NCTM membership are eligible to apply. For complete program guidelines and application instructions, see the NCTM website at: <http://www.nctm.org>

Cat's Science Club Workshop

Fat Cat and Crazy Cat, with their combined teaching experience of 35 years, will be holding a workshop in Wauseon, Ohio. The workshop will provide ways to engage students in hands-on learning with exciting activities that will captivate students' interest while investigating and discovering about electricity.

Learn how to teach students to build their own batteries and make their own generator and mini wind turbine!

Participants will connect Common Core to their curriculum, discover new ways to peak students' curiosity, and build models to demonstrate basic principles of electricity. <http://www.catsscienceclub.com/workshop.html>



Google Is Back With Its Fifth Annual Science Fair

The event is run in partnership with Lego Education, National Geographic, Scientific American and Virgin Galactic. It invites any students between the ages of 13 and 18 from anywhere in the world to enter submissions online to compete for prizes in a number of categories, ranging from scholarships and grants to once-in-a-lifetime trips of remote destinations, or a first-hand look at Virgin Galactic's new spacecraft.



The Science Fair has produced some incredibly impressive winners in years past, including a flashlight that requires only the ambient heat from a user's palm gripping the handle to power its beam, as well as wearable tech that can provide real-time effective healthcare response to serious problems associated with an aging population and the onset of Alzheimer's.

This year there are new categories, too, meaning more potential for world-changing award winners.

<https://www.googlesciencefair.com/en/>

Ohio Department of Education

The Ohio Department of Education is offering free Advanced Placement workshops this summer. The workshops will provide both current, experienced AP teachers and those seeking to teach AP with in-depth content and resources to enhance their teaching of AP courses at all teaching levels.

Teachers must register through STARS. To register, first access or create a SAFE account and click on the STARS system. Search for the key word "AP" to find the sessions more easily. First-time attendees will need to create an account and profile in order to search and register for these workshops. For more assistance or questions, please contact Yolande Berger, Advanced Placement Network Coordinator, at **(614) 466-2105**.

<http://education.ohio.gov/Topics/Ohio-s-New-Learning-Standards/Advanced-Placement-Program>



RAISE THE BAR PARENTS. There's a new website for parents who want to know more about Common Core and specifically how their child is doing. The site has grade-level videos of what to expect, as well as fun math and reading adventures that test a child's grade-level mastery of Common Core standards. Parents receive a detailed report as well as links to follow-up resources to help their child continue to grow. All the resources on the site are free. <http://raisethebarparents.org>

The Ohio Technology Summit

Sponsored by The Ohio Technology and Engineering Educators Association and TRECA

April 16-17, 2015

TRECA Building
100 Esecutive Dr., Marion, OH



Join us in Marion for our annual spring conference being held at the TRECA building. We have a great lineup of presentations which are listed on the following page. The conference is a great opportunity to talk with other technology and engineering teachers, learn new ideas to use in your classes, and to see a variety of school and vendor displays.

Featured sessions include:

- Let's Get Personal: Personalized Learning in an Elementary Classroom
- Not your typical classroom: NGLE + PBL = 21st century learning.
- Introduction to Google Classroom
- The STEM class you wish you had!
- "When will I ever USE this?": Connecting Content Standards to Real World Situations through Project-Based Learning
- Project Management in Education: Train Your Students Like a CEO Would Train Their Employees
- Guitars: Bringing Fun and STEM Education Into the Classroom
- New Engineering Design Challenges for Middle School
- You've Gotta Connect: Getting Students Engaged Early and Often
- FREE Google Apps and Extensions to Make Your Teaching Life Easier!
- Differentiating with Google Play for Education
- Class Dojo Classroom Management
- Google Apps Scripting For the Rest of Us
- STEAMing Up the Music Room: Take STEM and Add Some Arts To It!
- Career Pathways - The Answer to "Why?"
- Comparative Study of PLTW and EbD: A Pilot of Ohio Schools
- Armfield Desktop Learning Modules and STEM Curriculum
- PBL- Making Learning Real and Relevant
- Using Simple Machines To Learn STEM Concepts
- 3D Printing in the Classroom

To register for one or both days of the Ohio Technology Conference, go to

<https://events.r20.constantcontact.com/register/eventReg?oeidk=a07e9zeljz95c6d7a1f&oseq=&c=&ch=>

OTEEA Elementary STEM Fair

The Ohio Technology and Engineering Educators Association will host an Elementary STEM Fair on **Friday, April 17** at the TRECA Digital Academy, 100 Executive Drive in Marion, OH 43302. The half-day (**1 - 4 PM**) event will allow:

- participants to share lessons and ideas.
- sample elementary STEM resources from institutions and vendors.
- discuss issues concerning integrating STEM into the standards-based elementary classroom.



This is also an opportunity for educators, educational institutions and organizations, and commercial vendors to present lessons and resources related to elementary STEM. The cost to attend the event is only \$40 and presenters will attend for free. Those attending the Ohio Technology Conference can attend the elementary STEM Fair at no extra cost. To learn more about the resources that will be at the Fair or to download a registration form, go to <https://www.dropbox.com/s/w7doa6a3biq69h3/Elem%20STEM%20Fair%20flyer.docx?dl=0>

If you have questions concerning the elementary STEM Learning Fair, please contact Bob Claymier at bob@stemiselementary.com

NSTA Virtual Conference On STEM This April 25th

STEM programs provide the gateway for students to pursue successful careers in many expanding and dynamic STEM fields. If your school is looking to start or expand a STEM curriculum, then mark your calendar now for another quality all-day NSTA virtual conference exclusively on STEM scheduled for **Saturday, April 25**. From the comfort of your home learn from content and pedagogical experts and share ideas with colleagues during the live chat discussions. Choose from strands for teachers and administrators that offer fresh ideas and tried and true methods that work or mix and match the sessions that will suit your needs. <http://learningcenter.nsta.org/>

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NWO Hands-On STEM Activity

This lesson is shared with permission from American Chemical Society's middleschoolchemistry.com

Changing State: Melting

Teachers

March has finally arrived, which means Spring is here! All the ice and snow from our record-breaking cold winter of 2015 will be melting away. Use this lesson to teach your students about the scientific aspects of melting frozen matter.



Key Concepts

- Melting is a process that causes a substance to change from a solid to a liquid.
- Melting occurs when the molecules of a solid speed up enough that the motion overcomes the attractions so that the molecules can move past each other as a liquid.

Summary

Students will see a small piece of ice melt on an aluminum surface. Students will explain the energy transfer and molecular motion which cause the change in state from a solid to a liquid. Students will see and discuss an animation of ice melting and compare the state changes of water to the state changes of

other substances. They will also investigate sublimation of dry ice through a teacher demonstration, or video if dry ice is not readily available.

Visit the website to get the full lesson at: <http://www.middleschoolchemistry.com/lessonplans/chapter2/lesson5>

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Share Your Story!

Thank you for your support of NWO, our programs, our activities, and our partners. Please send us updates, press releases, and news of STEM happenings at your school, district, or organization. Please submit to nwo@bgsu.edu. We are always looking for great STEM education stories to feature in upcoming newsletters.

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