

Advancing science, technology, engineering, and mathematics education for people of all ages.



Vol. 10 Issue #1

January 2018

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Local teams place well at Falcon BEST Regional Competition

More than 600 middle school and high school students from around the northern region of the United States put their robotic skills to the test at the Northern Plains BEST Robotics Regional Championship from November 29 - December 1, 2017 in Fargo, ND. The competition was held at North Dakota State University, and thirty-two teams in total designed and built a robot to rescue a mannequin and remove hazardous chemicals from a simulated burning building.

Local teams from northwest Ohio who competed at the Falcon BEST competition at Bowling Green State University in October and qualified for the Regional Championships made the trip to Fargo and included Anthony Wayne High School, Cardinal Stritch Catholic High School, Maumee Valley Country Day School, Millstream Career Center, Port Clinton High School and St. Ursula Academy.



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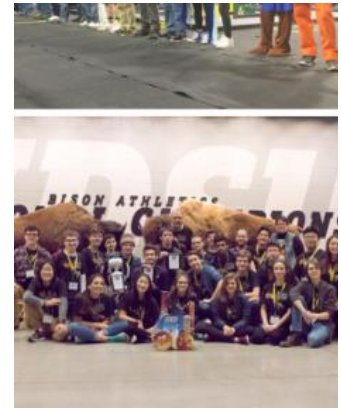
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Cardinal Stritch Catholic High School was awarded the "Team Exhibit Hardhat Award", which is awarded to the team with the most creative, best engineered and well-built team exhibit. They also placed 2nd in the Best Team Website Award.

The Maumee Valley Country Day School Robotics team had their best finish ever, finishing 10th out of the thirty-two teams and won several awards along the way, which included 3rd place for mascot, 3rd place for best YouTube video, and 1st place for Most Photogenic Robot.

Millstream Career Center from Findlay placed 4th in the Robotics Competition, 2nd for Most Photogenic Robot, and won the "Top Gun" award, which is awarded to the team that scores the most points in a single match during the competition.

Aside from the robot, each team was judged on the overall quality of their project, sales presentation, company exhibit, culture and business ethics. For more information on Falcon Best, please see: <https://www.bgsu.edu/technology-architecture-and-applied-engineering/college-overview/falcon-best-robotics-competition.html>



Community STEM in the NEWS

Finding a Path to Scientific Discovery

BGSU works with area schools to promote student research

By Bonnie Blankinship, BGSU

It's an unlikely setting in which to find a group of high school science teachers: gathered around tables in a concrete-floored, industrial style building, where a miniature Vietnamese pig snorts happily in her pen nearby, baby chicks and two pregnant Flemish giant rabbits share another pen and various types of mushrooms flourish in containers.

And that's just one small area of the rambling Frank Dick Natural Science and Technology Center (NSTC), a Toledo Public Schools vocational school adjacent to the Toledo Botanical Garden, located at 5561 Elmer Drive.



But the unusual space is a wonderland for students to learn about the natural world, and a perfect setting for teachers to learn about how to guide and inspire the students to conduct original research. The teachers, from NSTC and Springfield High School, are part of a project led by Bowling Green State University whose aim is to increase the number of underrepresented students participating in the Ohio Junior Science and Humanities Symposium (OJSHS) in March and engage students in scientific research and STEM studies, showing them they could have successful careers as STEM professionals.

The teachers and BGSU directors Dr. Emilio Duran, a professor in the BGSU School of Teaching and Learning, and Susan Stearns, assistant director for programming and development of the Northwest Ohio Center for Excellence in STEM Education (NWO), have been meeting regularly since the beginning of September, putting in long hours after the school day to make the project a success.

"It's really important, and one of the four elements of the program, to have the bulk of the teachers in the same building so they can plan and work together," Duran said of the frequent group meetings.

Toledo Natural Science Technology Center student Charlette Hornyak works on a project in the greenhouse. "It's a very big commitment," Springfield biology teacher Marty Perlaky said. "But the opportunity we can provide to our students is bigger than the commitment. It makes me a better teacher, but the real driving force behind why we get involved and why the BGSU professors write the grants is to make sure underprivileged and underserved kids get chances."



The NSTC is participating for the second year in the program, and its participating teachers from last year, Bryan Ellis, Laura Schetter and Stephen Oswanski, are mentoring their new Springfield High School faculty colleagues Perlaky, Austin Baker, Stephanie Mahoney, Coti Klim: McKenna Reitz, and Matt Lucas, along with first-time NSTC participant Natalie Cook.

BGSU will provide scientists and other mentors for the students. "We hope to have about 125 kids participating," Perlaky said of the Springfield contingent. NSTC anticipates another 100 of its students will

take part. The goal of the project is to have 200 or more students in all.

The University received \$200,000 in funding, administered through NWO, from the [Army Educational Outreach Program](#) (AEOP), in collaboration with Battelle, which aims to address the "clear and alarming erosion in the nation's STEM capabilities, evident in both the skills gap plaguing major industries and students' lagging achievement in mathematics and science compared to peers around the world."

BGSU is one of only two organizations nationwide to receive the grant funding for a second year.

On a recent evening, the teachers shared dinner while Dr. Jodi Haney explained the expectations of the Ohio Junior Science and Humanities Symposium, how to frame research questions and objectives and complete each required section of the posters the students will make about their projects. Posters from the previous year's NSTC students' projects made good examples, and the center teachers also provided insight.

Haney, a BGSU professor emeritus of environmental science and teaching and learning, is a noted expert in hands-on, experiential learning in the STEM disciplines.

"By using this poster template and breaking it down into easily understandable parts, we can reduce the stress and fear the students might feel," Haney told the teachers. "We want to make them feel good about doing science by taking away the judging aspect and letting them feel the joy of discovery. It's a growth mindset."

"The true heroes in this are the teachers," said Duran, the principal investigator for the AEOP grant. "They work before, during and after school and on weekends on this. They strive to make the research relevant to the students and show its worth so they can feel pride. Also, generally teachers are not trained to be researchers, so we are giving them the support and skills they need to lead the students."

In addition, all participating teachers will be certified in Global Learning Observations to Benefit the Environment (GLOBE), an international science education program that promotes worldwide participation in data collection, data sharing and the scientific process - helping to foster not only the next generation of STEM professionals but also citizen scientists.

Duran, whose background is in biology as well as education, has also been director of the Ohio Junior Science and Humanities Symposium for 15 years and has been involved in numerous experiential learning initiatives in the sciences.

"But this is such a special project," he said. "Some of the students who participated last year said it was the most meaningful thing they'd ever done in their lives. It really built their self-esteem and their confidence. It was transformational.

"It's very powerful because the students have the choice of what they want to research, so these are authentic, student-driven projects. The grant also provides \$200 per person for supplies and equipment, so they can actually do the work."

Students so far have expressed interest in everything from astronomy to DNA to psychology to drones (one of which the NSTC has, for agricultural research). In addition to the resources of the Natural Science and Technology Center, Springfield has an area of wetlands behind its football fields that can serve as an excellent learning environment, Stearns said.

"Right now, we're getting the students thinking about what they might like to do," Perlaky said. "You never know where someone might go with it. The topics are all very self-directed and motivated, so they really have a stake in it. These are not science fair projects where the results are already known. These students are trying to find out things nobody knows, and we'll find the right mentor to work with them."

All these factors are extra important in schools where some students face tremendous economic and social challenges and disadvantages, Duran said.

NSTC urban agriculture teacher Bryan Ellis is a passionate advocate for the students and for giving them - many of whom have never been exposed - a better understanding of the natural world.

He is teaching them not only conventional methods of farming, raising tilapia, cultivating mushrooms, forestry,

aquaculture, botany and more, "but also the newer and more sustainable practices," he said. "We're looking for the next great way of growing things. We have an inquiry-based science program."

While they learn skills that prepare them for jobs, his students are also conducting experiments on such questions as whether invasive plants might actually sequester carbon in a way that's beneficial to native plants and which light spectrum most benefits the growth of hops.

Duran described NSTC's Ellis, Schetter and Oswanski as "independent thinkers," and all are energetic, enthusiast proponents of the goals of the AEOP program.

"We were thrilled when we learned we had received a second round of funding so we could bring in even more students," Stearns said. "We witnessed last year how enthusiastic the students were and how they embraced the program. The teachers' relationship with them is really wonderful. They've even done activities like having evening campfires - these are special things you don't see very often."

Top Photo - Springfield teachers McKenna Reitz and Marty Perlaky (left and right) and NSTC teacher Natalie Cook (center) conduct fieldwork for their Global Learning Observations to Benefit the Environment certification.

Bottom Photo - Toledo Natural Science Technology Center student Charlette Hornyak works on a project in the greenhouse.

This article is shared with permission from BGSU

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STEM Opportunities

Siemens STEM Day

Possibility Grant Sweepstakes/Make STEM Dreams Come True

The Siemens STEM Day Possibility Grant Sweepstakes is **NOW OPEN!** Enter daily for the chance to "fab" your lab with the latest and greatest gadgets like top-tier technology and state-of-the-art supplies for STEM education. The possibilities are endless, so be sure to enter every day!



Sweepstakes closes on April 1, 2018

Siemens STEM Day offers a diverse portfolio of STEM engagement opportunities for K-12 educators and students

Visit the website at: <https://www.siemensstemday.com> to see over 145 FREE interactive activities that will spark students' interest in STEM.

Join in on the conversation online: #IDreamOfSTEM #STEMday

Xcite Learning hosting a Two-day Workshop on Mindset

Xcite Learning will be hosting a two-day workshop at The 577 Foundation in Perrysburg in February. The workshop is specifically designed for grades K-12 educators of ALL disciplines.



February 22 & 23, 2018 (only 9 spots left)

Mindset 101 - Mindset is a theory developed by Carol Dweck, Ph.D. regarding the psychology of success. Dweck makes the case that people with a GROWTH [vs. FIXED] mindset are much more apt to fulfill their potential, persevere when faced with adversity, and take on more challenging tasks. Join us in examining the theory and using it as a practical framework to develop teaching materials, routines, and practices that support the psychology of success for immediate implementation for your classroom, team, school, and/or home. All participants will receive a copy of a growth mindset playbook (filled with practical mindset strategies and practices along with other ready to use materials). Bring a team and develop an interdisciplinary growth mindset action plan for your group [team discounts available]. [Sign Up HERE!](#)

For this workshop and others please visit: <http://www.xcitelearning.com/join-us-.html>

Young Scientist Challenge

Calling all curious minds and problem solvers! The Young Scientist Challenge is now open for entries. Students in grades 5-8 are invited to submit a 1-2 minute video describing a unique solution to an everyday problem for the chance to win \$25,000 and an exclusive 3M Mentorship. Ten finalists will be chosen for their passion for science, spirit of innovation and ingenuity, and effective communication skills.



For more information: <https://goo.gl/wtSnC5>

INFOhio Professional Learning Your Way



Please see INFOhio's interactive Professional Learning Choice Board, a new page on INFOhio's site, that allows users to quickly determine the right resource for their needs. Also available as a flyer for printing and sharing.

<https://goo.gl/B1wEsF>

STEMx Webinar

STEMx "On Stage and Supporting Dual-Language Learners", a webinar for participants to hear from expert presenters about tackling two of STEM's hardest challenges: Meaningful integration with the creative arts and language and literacy-rich STEM experiences for young dual-language learners.



January 17, 2018: 4-5 p.m. (EST)

<http://www.stemx.us/news/2017/12/webinar-stem-on-stage-and-supporting-dual-language-learners/>

Science Education Council of Ohio

Dream Bigger! Symposium

A celebration of science and STEM in Ohio with many STEM presentations and exhibits in a new venue.

For more information and to register: <https://scienceeducationofohio1.wildapricot.org/page-18198>

Chemical Education Foundation/You Be the Chemist

Monthly webinars will be focused on requested topics and will provide strategies for teaching science competently.

"But I Don't Teach Chemistry!" Webinar

Tuesday, February 13, 7-8 p.m. ET

Join the Chemical Educational Foundation and the American Association of Chemistry Teachers for a hands-on webinar to explore chemistry connections through the You Be The Chemist® programs. Three expert elementary and middle school educators will guide participants through interdisciplinary, hands-on activities that demonstrate how chemistry is the foundation for life, earth, and space science; history; physics; and music. Find out how to use chemistry content to enhance learning - even if not a chemistry teacher!

For more information visit: <https://teachchemistry.org/professional-development/webinars/but-i-don-t-teach-chemistry>

Discover Engineers Week

Engineers Week is February 18 - 24, 2018

A "How To For Educators" Webinar will be offered on **January 29, at 7:00 pm.**

Teachers who are looking to bring engineering into their classrooms or afterschool programs will benefit and hear from experienced educators how to:

- Invite an engineer to the classroom
- Find nearby engineering events or opportunities
- Organize an engineering fair
- Locate high quality activities

To register, please see: <https://register.gotowebinar.com/register/7434796859481655554>

Hour of Code

On its **4th anniversary**, the **Hour of Code** passed 500 million served - an incredible accomplishment for all the educators, nonprofits, corporations and governments that support this global campaign.

Among tech companies, Microsoft helped create a new edition of the ever-popular Minecraft Hour of Code tutorial, Google changed their logo into a coding tutorial, Apple hosted an Hour of Code in every store and Tim Cook participated at a Shanghai school for the deaf. In addition, Amazon Web Services provided the technology platform to host the Hour of Code, and Accenture ran a video about the Hour of Code in Times Square.



To plan an Hour of Code, and read more about the worldwide impact, please see: <https://medium.com/@codeorg/the-hour-of-code-around-the-world-2b939e6c9540>

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NWO STEM Activity

Bath Fizzies

This month's activity is brought to you by Xcite Learning: www.xcitelearning.com

What You Need:

DRY INGREDIENTS



- Baking Soda - 1 cup
- Citric Acid - 1/2 cup
- Corn Starch - 1/2 cup
- Salts - 1/2 cup (we used honey & milk epsom salts)



WET INGREDIENTS

- Water or Witch Hazel in a spray bottle: just a spritz (enough to just dampen the dough)
- Essential Oils (we used a citrus oil)
- Oil - 1 to 2 tablespoons (we used Baby Oil)
- Food Coloring

What To Do:

1. Start by mixing together all of your dry ingredients into one bowl. It's a good idea to get everything mixed as evenly as you can, so take your time here!
2. Add in a small amount (dropper full) of the wet ingredients at a time and stir QUICKLY and vigorously. You will see a slight reaction, but the stirring will help stop it. ONLY use as much of the liquid as needed to create a moldable dough (error on the side of more dry than wet).
3. Using your spray bottle, spritz your dough with just a little bit of water or witch hazel. You don't want too much or your mixture will start to react. Stir. You want the dough to be moldable, but not mushy. Error on the side of more dry than wet.

What to do continued on pdf file

Download a pdf of the complete hands-on activity by [clicking here!](#)

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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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