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K-16 STEM in the NEWS**Falcon BEST Robotics Holds Thrilling Competition**

The very first Falcon BEST (Boosting Engineering, Science, and Technology) Robotics competition took place October 26, 2013 at Anderson Arena on the campus of Bowling Green State University with a thrilling day-long event. Presented by BGSU's College of Technology, Architecture and Applied Engineering and the Northwest Ohio Center for Excellence in STEM Education (NWO), this event was the final "game day" installation of a six-week process by over 300 students from 14-area middle and high schools. Falcon BEST is a hub in the national BEST organization.



Teams competed in a robotics competition and had the opportunity to compete for the the BEST Award. For the robotics competition, each participating school is provided an identical kit of equipment and parts, a set of game rules, and was given six-weeks to design, build, and test a Remote Controlled robot to "outperform" other robots. Engineers, University faculty members, and other technical professionals from local industries served as team mentors, and advised and guided students throughout the design and construction of their robot.

The BEST Award was presented to the team that best embodied the concept of "Boosting Engineering, Science, and Technology." The 5 elements of the BEST Award included:

- Leadership development,
- Presentational skills,
- Technical skills,

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- Organizational skills,
- Problem solving abilities, and
- Other areas of personal and career development.

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This amazing competition, which the students fully embraced, teaches students how to think through a problem, analyze and solve it together, while building many skills, which include:

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- Leadership development,
- Presentational skills,
- Technical skills,
- Organizational skills,
- Problem solving abilities, and
- Other areas of personal and career development.

[The Toledo Zoo is now offering snoozes for schools!](#)

[NWO STEM Education Inquiry Series](#)

NWO Hands-On STEM Activity



The series of events began with a Kick-Off on September 14th, at BGSU's Perry Field House, where the game challenge and playing field were unveiled, and thus the six-week long "design-and-build" phase began. This was followed by "Mall Day", where the teams practice-drove their robots on a playing field set up at Woodland Mall in Bowling Green, OH.

[Using Fall Leaves](#)

[\(read more\)](#)

Alfie Kohn Challenges NWO Symposium Participants

What would a classroom be like for students without doing homework, taking standardized tests...or even earning letter grades?

These are the questions Alfie Kohn, accomplished author and outspoken education critic, challenged his audience with at the NWO Symposium on STEM Teaching and Learning, held at BGSU on November 2. Audience members (in this case, hundreds of area educators and administrators) were asked to think about exactly how, and exactly what, students are learning in school. Alfie argued that true educational reform needs to start with the teacher, and throughout his talk, he pressed educators to question the ways that teaching and learning happen in the classroom.



Mr. Kohn did not shy away from controversial topics: homework, standardized testing, reward systems, and merit-based pay for teachers were all discussed with the same striking enthusiasm. He also questioned popular educational efforts, like the use of educational technology, that he believes sometimes undermine meaningful learning in the classroom. *"Most use of technology in education consists of giving a digital sheen to nineteenth-century pedagogy: various toys, like interactive white boards, do nothing to challenge a teacher-*

centered classroom" Alfie forcefully stated.

Within his keynote address, Alfie provided a much-needed critical perspective on instructional practices that many in the field of education have simply learned to live with. He challenged educators to question the commonly touted ideas of "data driven instruction" and "hands-on learning," pointing to the often superficial ways in which the ideas are implemented. Throughout the presentation, Alfie invited educators to reflect on how they can make their STEM classrooms a student-centered and active learning environment:

"The traditional "bunch o' facts" model of education applied to STEM subjects consists of filling students with information about decimals and variables, cells and minerals. The process typically relies on lectures, worksheets, grades, tests, and homework. But our challenge is to help students think like scientists and mathematicians so they can actively make sense of ideas -- and, ideally, to take pleasure in doing so."



Jake Burgoon, NWO Evaluator, was truly inspired by Alfie's talk, and said, "His passion for education was contagious! The best part was that it made you want to make a difference! I could see teachers nodding their heads and smiling as he spoke. I like to think those teachers are going back into their schools with a renewed motivation to make a change."

Alfie is a prolific author and speaker, who writes and speaks widely on human behavior, education, and parenting in the U.S. and around the world. The author of twelve books and scores of articles, he lectures widely at education conferences and universities as well as to parent groups and corporations.

His criticisms of student competition and rewards have been widely discussed and debated, and he has been described in Time magazine as "perhaps the country's most outspoken critic of education's fixation on grades and test scores." These criticisms have helped to shape the thinking of educators, as well as parents and managers, across the country and abroad.

For more information on the NWO Symposium, please visit: www.nwocenter.org/nwoSymposium

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We've changed our Facebook locations.... check us out!



www.facebook.com/NWOSTEM

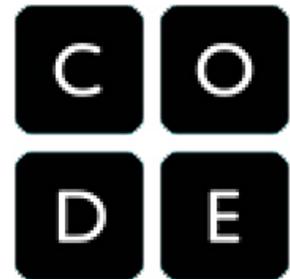
STEM Opportunities

Computer Science Education Week

December 9 - 15, 2013 - The Hour of Code is Coming!

Code.org is a non-profit dedicated to growing computer science education. Their vision is that every student in every school should have the opportunity to learn computer programming, or how to "code"

. Code.org believes computer science should be part of the core curriculum in education, alongside other science, technology, engineering, and mathematics courses, such as biology, physics, chemistry and algebra. For more information, visit <http://code.org> and view an inspirational video by Mark Zuckerberg, Bill Gates, Will.i.am, Chris Bosh, Jack Dorsey & other heroes!



BGSU Science and Math Education in ACTION

Teachers/Administrators: Please pass this information on to students who may be considering careers in teaching science and/or mathematics.

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Four-year scholarships are available at BGSU for incoming freshmen considering careers in teaching science and/or mathematics. The Ohio Board of Regents has awarded Choose Ohio First grant funds in order to promote STEM education. This unique program called **Science and Math Education in ACTION** offers recipients nearly \$20,000 over four years!



High school seniors considering teaching either secondary science or math OR middle childhood science and math may be eligible for this scholarship program.

The deadline to apply for Fall 2014 is January 27, 2014.

The ACTION program also offers unique opportunities for students such as a month-long Summer Bridge program to prepare incoming freshmen for college, personal interactions with faculty, involvement with science or math research projects, and real-world, hands-on experiences in science and math.

For more details, criteria and an application, go to <http://www.bgsu.edu/action>. For additional questions, please call 419-372-6562 or e-mail action@bgsu.edu.

Verizon Foundation Launches Innovative App Challenge

The Verizon Foundation, in partnership with the Technology Student Association, has opened the 2013-2014 Innovative App Challenge, giving middle and high school students across the country a chance to develop a concept for a mobile app and bring it to market. The mobile app design competition aims to engage students in STEM subjects and empower them to create STEM-related app concepts that solve real-world problems in their community or school. Students have a chance to win Samsung Galaxy Note 10.1 tablets courtesy of Samsung Telecommunications America, cash grants of up to \$20,000 for their school, and the opportunity to team up with app development experts from the Massachusetts Institute of Technology Media Lab to build and bring their apps to life. Verizon will help winning teams bring their app to the Google Play store, available for download.

VERIZON INNOVATIVE APP CHALLENGE



Submissions will be accepted now through Dec. 3. Teams can submit their app ideas, access tips and instructional videos on app design, and learn more about the Verizon Innovative App Challenge at: www.verizonfoundation.org/appchallenge.



Kids' Tech University goal is to create the future workforce in science, technology, engineering, and mathematics by sparking kids' interest in these fields.

The 2014 Interactive Sessions at BGSU have been announced:

- **January 25, 2014:** "What is this green slime in Lake Erie, why is it there, and what can be done to get rid of it?" - Answered by Dr. Douglas Kane
- **February 22, 2014:** "The Genetic Code: Is it the piano that's important, or the music played on it?" - Answered by Dr. Victor Raboy
- **March 22, 2014:** "How can human health benefit from naturally occurring microbial fights?" - Answered by Dr. Hans Wildschutte
- **April 12, 2014:** "Why do animals fight? Aggression and contests of strength in the freshwater crayfish" - Answered by Paul Moore

For more information, please visit: <http://kidstechuniversity-bgsu.vbi.vt.edu>

National Council of Teachers of Mathematics

Program of Mathematics Study & Active Professionalism
Grants for Grades PreK-6 Teachers



The purpose of this grant is to provide financial support for teachers seeking to improve their understanding and appreciation of mathematics, by completing course work in school mathematics content and pedagogy while working toward an advanced degree, taking an active professional approach toward teaching mathematics.

For more information: <http://www.nctm.org/resources>

Hands-on Polymer (Plastics) and the Environment

Saturday, December 14, 2013 8:30 a.m. - 4:00 p.m.

Engaging presenters from Ohio EPA and the Environmental Education Council of Ohio will provide the

knowledge and the tools necessary to connect the creation, manufacturing, and use of polymer plastics to the environmental issues of recycling and resource deletion. This workshop will allow participants to make bouncing balls, polymer bracelets, shrinking plastic, instant snow, and work with other polymers. Teachers will receive copies of lesson plans, a bag of sample materials including resins, sink/float demonstrations, preforms, and other related materials to take back to the classroom. Topics will include an introduction to polymers, characteristics of polymers, packaging, recycling numbers, science safety, and hands-on activities. \$5 workshop fee.

For more information contact:

- **Jill Snyder** at Columbus Highbanks Metro Park, (614) 846-9962 or snyder@metroparks.net
- **Linda Pettit** at Franklin Soil and Water Conservation District, (614) 486-9613, ext. 115 or lindapettit@franklinswcd.org
- **Dona Rhea** at Delaware SWCD, (740) 368-1921 or dona-rhea@delawareswcd.org

International Technology and Engineering Educators Association

Free Engineering by Design Curriculum!

Ohio is a member of a 19-state consortium formed by the **STEM Center for Teaching and Learning**. As a member of this consortium, Ohio schools are able to access freely the **Engineering by Design** curriculum materials.



Engineering by Design is a standards-based K-12 STEM curriculum developed by the STEM Center for Teaching and Learning, under the guidance of the International Technology and Engineering Educators Association (ITEEA). More information is available at:

<http://www.iteea.org/EbD/CATTS/catts.htm>

Ohio Department of Education

Proposals for New STEM Schools, Due: March 14, 2014

The goal of STEM schools is to foster intellectual, entrepreneurial and technical talent. This is vital to Ohio's future economic growth and prosperity, which depends on an aligned education system to support the state's economic development efforts and that helps all Ohio students become innovators and inventors, self-reliant and logical thinkers and technologically proficient problem solvers.

Proposals for STEM schools should incorporate the following:

- Create a public school (in any of the grades 6 through 12) to help generate a talent base that will establish Ohio as a magnet and global leader in attracting, educating, and producing the next

generation of scientists, engineers, and other professionals needed to create tomorrow's innovations for the betterment of all citizens;

- Foster increases in the number of Ohio citizens studying and working in STEM fields;
- Foster increases in all students developing stronger skills in problem solving, innovation, and teamwork.

Please visit: <http://education.ohio.gov/Topics/Academic-Content-Standards/Technology/STEM-%E2%80%93-Science-Technology-Engineering-and-Mathemat>

World of 7 Billion Student Video Contest

Deadline: Friday, February 21st, 2014

World of 7 Billion announces their annual student video contest. This year's contest challenges high school students to create a short video (60 seconds or less) that illustrates the connection between population growth and one of the following global topics: climate change, global poverty, or water sustainability.



Videos will be judged by topic, with **four cash-prize winners (ranging from a grand prize of \$1,000 to an honorable mention of \$250) per topic**. The contest is open to high school students worldwide. Participating teachers have an added benefit! If 10 or more students participate, receive a complimentary set of Population Education curriculum and resources. This is a great opportunity to get students thinking about global issues and the interdependence of people and the planet!

Complete Contest information is available at: www.Worldof7Billion.org along with contest rules, judging rubrics, and background readings on each topic, as well as last year's winning videos.



Teachers: Announcing an exciting learning opportunity for students grade 5-8

"You be the Chemist" is a **FUN & INNOVATIVE** academic competition engaging students in learning about important chemistry concepts, discoveries, and chemical safety.

CHALLENGE COMPETITIONS take place across the country and encourage collaboration among community organizations, schools, and the chemical industry.

The **TOP STUDENT** in the State Challenge **QUALIFIES** for an all expenses paid trip to the National Competition in Philadelphia, PA in June!

Participating is easy - please email Bob Mendenhall (Toledo Public Schools) at rmendenh@tps.org or call **(419) 671-8320** more information. In the email include the following information: **(RETURN BY DECEMBER 3, 2013)**

Teacher Name:

Principal Name:

School Address (include County):

Number of Students Participating:

Please visit <http://www.chemed.org/ybtc/> for more information.

Frostology: The Science of the Season November 16 - January 5

Explore the slippery science of snow, make engineers out of elves, and create masterpieces from paper. Don't miss a collection of Toledo artist, Mary Gaynier's, festive and beautifully cut snowflakes. Explore a 36 sq ft LEGO® village and a 4 ft tall Christmas tree made by LEGO artist Dan Parker. Learn about superabsorbent polymers, angles, symmetry, and chromatography as you experience Frostology: The Science of the Season. Learn more at: <http://imaginationstationtoledo.org/content/2012/09/holiday-hours-and-activities/>



GOOGLE in Education Ohio Summit

Mark your calendars for May 12 - 13, 2014!

ITIP Ohio (Instructional Technology Integration Partnership) is pleased to announce the dates for next year's Google in



Education, Ohio Summit. **This year the conference will be held at the Kalahari Resort & Convention Center in Sandusky, Ohio.**

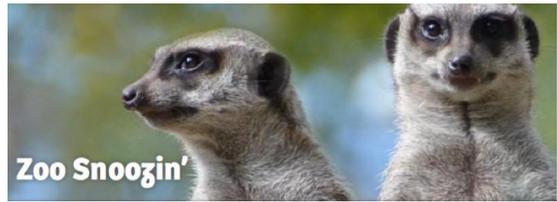
Watch for registration and the opportunity to submit a session proposal to be available soon.

<http://www.itipohio.org/OhioGoogleAppsConference.aspx>



The Toledo Zoo is now offering snoozes for schools!

Snoozes are a unique opportunity that allow students hands-on learning through games, live animal demos, team-building activities, and a special night hike through the zoo. This overnight program is not only fun but also covers many science standards about adaptations, food chains, and ecosystems. These snoozes will be offered throughout the school year on Tuesday, Wednesday, and Thursday nights.



For more information visit www.toledozoo.org/snooze or email peggy.coutcher@toledozoo.org!

Lights Before Christmas, presented by KeyBank, Nov. 15 - Dec. 31, 2013

NEW this year, don't miss the Festive Feast starting Dec. 2, and the outdoor ice rink sponsored by Taylor Automotive Family. toledozoo.org/lights

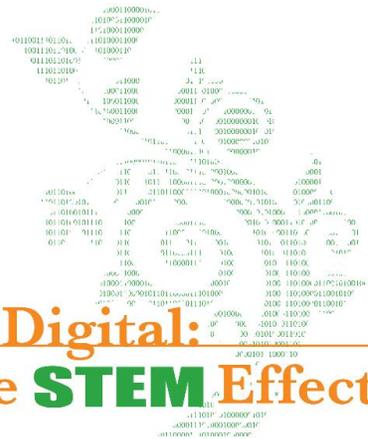
NWO STEM Education Inquiry Series

The theme of this year's series is: **Going Digital: The STEM Effect** and focuses on incorporating digital tools and technology into the preK-12 STEM classroom.

December 10, 2013 - David Harms: Using Flipped Technologies to Increase Student Performance in a Traditional Classroom

January 14, 2014 - Betsy Hood: Connect, Communicate, and Collaborate with Web 2.0

February 11, 2014 - Savilla Banister: Embrace the



Chaos! Using Digital Resources to Empower Learning

March 4, 2014 - Carrie Rathsack: Using Creativity Tools for Active & Engaged STEM Learning

Registration information is on our website at: <http://cosmos.bgsu.edu/inquiryseries>

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NWO Hands-On STEM Activity

Using Fall leaves

For grades 3-5

Teachers, take students on a walk around school grounds if possible, or have students bring in leaves they collect from home. Then, use the leaves in the following ways. Students will like analyzing the many vibrant colors of autumn and leaves.



Leaf Cycle

Students learn about the life cycle of a leaf, why they change colors, etc. Students can make a small book (individually or in groups) in which each page illustrates and explains the life cycle of a leaf.

Leaf Sorting

Teach students to differentiate between leaves by shape, size, blades, etc. Have them sort a group of leaves by common characteristics. Discuss why leaves are different.

Graphing

Using the leaves collected by students, graph the colors of the leaves.

Leaf Measurements

Have students practice measurements using leaves. Use small cubes or paper clips to measure the length and width of a leaf. For older students, use a ruler to measure length and width in inches. As an extension activity, have students graph leaf sizes.

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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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Find Even More Ohio STEM Education Resources

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