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February 2015

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K-16 STEM in the NEWS**Math Camp: A BGSU Student Led Adventure**

Math Camp is a fun and new concept designed to teach mathematics to elementary school kids in an energetic and active way. Adapted from a similar program in Thailand, students engage in fun filled experiences about mathematics, and explore the connections between mathematics and the real world, all in a camp atmosphere where there is song, dance, and silliness. The daylong program is designed to incorporate teamwork, problem solving, and development of skills. Each math camp is specifically designed by the preservice teachers of the Bowling Green Council of Teachers of Mathematics (BGCTM) at BGSU with oversight from BGSU's mathematics education faculty, including Dr. Gabriel Matney, who first experienced the program while visiting Thailand and wanted to bring it to preservice teachers at BGSU. Early last year he took a group of BGSU students to Thailand so they could see first-hand how successful the program is with younger students. The program is aligned with the Common Core and New Ohio Learning Standards for Mathematics.



This past fall the BGSU students who first experienced the program in Thailand with Dr. Matney held a camp for other mathematics education students at BGSU to train as facilitators for future K - 12 camps. On February 7, 2015 over 20 BGCTM student leaders conducted a math camp for 60 4th grade students from Napoleon Area Schools.

Maria Nielsen and Kevin Knapke, both co-leaders for the Napoleon camp, stated the camp was a lot of fun and students were so excited that they forgot they were learning. "Bongos incorporate Thailand culture into the

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camp, and music keeps the energy up of the students. They learn a Thai song that has math formulas, and dance and sing together in teams," Maria stated.



The camp also features a Brain challenge where the students get into teams and solve math questions, followed by activities including geometry, sudoku, and a jigsaw station. The day culminates with a closing ceremony where awards and prizes are given to each team. Kevin said, "My favorite thing is to see how the students are so happy and

engaged and full of excitement."

The BGCTM preservice teachers work with a school liaison to identify specific areas of mathematical need for the students in order to design a worthwhile and focused camp experience.

Research has shown that students who attend BGCTM Math Camps demonstrate statistically significant improvement in their mathematical self-efficacy, are more comfortable with mathematics, and become more flexible in their problem solving strategies.

Maria went on to say, "I really like working with BGSU students because the purpose of camp is to show our future educators that math doesn't have to be about note taking and lecturing and memorization, but that it can be fun with engaging activities. It changes their perspective in what kind of teacher they want to be!"

Community STEM in the NEWS

Area Schools Set To Compete In Two State Robotics Championships

FIRST LEGO LEAGUE

Students from the three Sylvania schools of Sylvan Elementary, McCord Junior High and Highland Elementary qualified for the FIRST Lego League (FLL) state championships. Teams qualified by placing well in district and regional competitions by engineering their robots to perform certain assigned activities at the competitions held earlier in the school year. Fifty Ohio teams from FIRST Lego League will vie for two top spots. Winners will be invited to the world championship held in St. Louis on April 22-25. They will also be invited to the North American Open at Legoland in Carlsbad, Calif., May 15-17. To qualify for this weekend's event, teams had to win district and regional championships.

At the championships, the students will be judged on their research as well as completion of robot missions.

FIRST is a collaboration between the LEGO® Company and FIRST (For Inspiration and Recognition of Science and Technology), a non-profit organization founded by Dean Kamen that is committed to creating robotic competition programs that will excite and inspire children from Kindergarten through high school to excel in math and science.

FLL is a multi-disciplinary program that combines engineering, computer programming, problem-solving, researching, presenting and teamwork into an intense 8-week period. Teams of 3 to 10 students, ages 9 - 14, work to build and program a robot to complete a number of tasks on a competition table in a 2.5 minute robot round. Teams compete in a sports-like environment. Teams also meet with Robot Design Judges, who evaluate their robot design, programming and their problem-solving strategies; Project Judges, who look at their research project, solution and outreach; and Core Values Judges, who evaluate how well the group functioned as a team and incorporated the values of FIRST.

FIRST TECH CHALLENGE

Another robotics competition entitled the FIRST TECH CHALLENGE is designed for students in grades 7-12 to compete using a sports model. Teams are responsible for designing, building, and programming robots to compete in an alliance format against other teams. The robot kit is reusable from year-to-year and is programmed using a variety of languages. Teams, including coaches, mentors and volunteers, are required to develop strategies and build robots based on sound engineering principles. Awards are given for the competition as well as for community outreach, design, and other real-world accomplishments.

A team from the St. John's Jesuit Robotics club has advanced to state level of this robotics competition, by winning the regional championship trophy. This team also earned the additional distinctions of the Control Award for best programming, Connect Award for reaching out to community through robotics, Design Award for unique and effective design of robot, and the Inspire Award for doing well in all categories and showing gracious professionalism.

The team is coached by St. John's engineering and mathematics teacher Mr. Robert Holman, who after working with robotics teams for three years, is "feeling good about the team's chances to advance past the state level." He challenges his students to use outside materials from the kits they are given and to use plexiglass to fabricate their own parts." We've improved so much throughout year and have done a significant amount of improvement on robot. Structurally it's pretty much done and we've been focused on programming getting ready for the tournament. The team has been meeting after school throughout the school year.

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STEM Opportunities

Math Teachers' Circles

Through an Improving Teacher Quality Grant funded through the Ohio Board of Regents, Black Swamp Math Teachers' Circle (BS-MTC) is now accepting applications from interested mathematics teachers. BS-MTC



includes a Summer Immersion and monthly meetings during the school year. A core group of teachers will participate throughout the year, with others invited to join in the academic year meetings.



There are four goals:

- Increase the confidence of math teachers in problem solving.
- Deepen teachers' content knowledge through exploring mathematically rich problems and develop an arsenal of techniques to solving unfamiliar and challenging problems.
- Form long-term professional relationships among teachers and mathematicians, through regular, highly interactive meetings.
- Provide support for teachers who want to bring richer mathematical experiences to their students.

Participants in this project will be required to:

- Attend a spring 2015 meeting in late April (date to be determined).
- Participate in the Summer Immersion, July 27-31, 2015. (Hotel room in Findlay, OH provided for participants each night of the weeklong training.)
- Participate in monthly meetings in the fall and spring of the 2015 - 16 school year (dates to be determined).

Participants will receive:

- Stipends for the 5 day summer immersion workshop.
- NCTM publications.
- Classroom materials for projects.
- Great professional development.
- Networking with mathematicians, higher education faculty and other classroom teachers.

For more information, please contact Dr. Debra Gallagher, Bowling Green State University, at dgallag@bgsu.edu or 419-704-1920.

The deadline to apply is Friday, February 27, 2015

To submit your application, please complete the form at the following link.

https://docs.google.com/forms/d/1rmPR2eILyX_CQBFmayB_wqFjEYL1D_u-6dILZi0t75k/viewform

Ohio JSHS

March 18-20, 2015
The 52nd Annual Ohio Junior
Science and Humanities Symposium



**Attention Junior High and High School Students and Teachers:
Call for Research Papers and Posters!**



The Ohio Junior Science and Humanities Symposium is an annual event held on the campus of BGSU in which Ohio students in grades 7 to 12 compete for scholarships and recognition by presenting the results of their original research efforts before a panel of judges and an audience of their peers. The OJSHS is part of the national Junior Science and Humanities Symposia Program, which is jointly sponsored by the United States Departments of the Army, Navy, and Air Force, in cooperation with leading research universities throughout the nation.

Deadline for student and teacher registration is Friday, February 20, 2015.

More information can be found at www.ojshs.org

Climate Hope Series

FEB 26
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!**

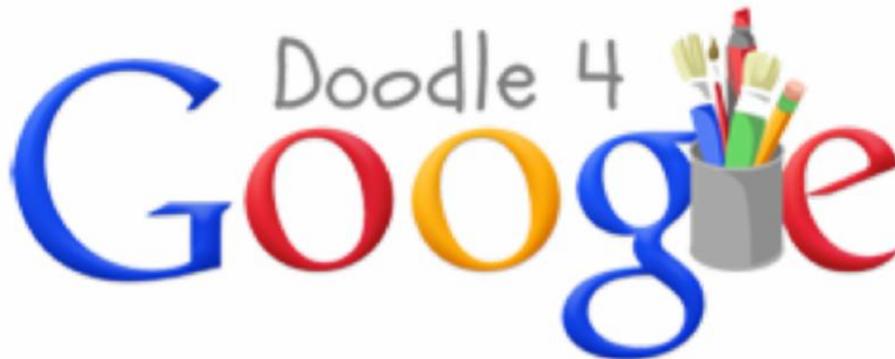
SAVE THESE DATES & TOPICS: Climate Change as related to:

February 26: Local Water Resources

March 19: Northwest Ohio Sustainable Energy

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

Space is limited so **REGISTER TODAY** for Feb. 26 & March 19 at www.577foundation.org (go to Get Involved/Take A Class/Climate Hope)



The 8th annual **Doodle 4 Google** competition is now underway inviting K-12 students to design their own Google Doodle for the chance to see their artwork on the Google homepage. One talented student artist will also receive a \$30,000 college scholarship, and a \$50,000 Google for Education Technology Grant for his or her school. **Closing date for entries is Thursday, March 20th.**

Visit the website for more information: <https://www.google.com/doodle4google/>

CELERE Design Challenge

Capillary Effects on Liquids Exploratory Research Experiments (CELERE)

(Grades 8-12 or multilevel teams in grades 5-12)

The **CELERE Design Challenge** is a joint educational program of NASA and Portland State University (PSU), enabling students in grades 8-12 to participate in microgravity research on capillary action, similar to that conducted on the International Space Station (ISS). Every team will create their own experiment using Computer-Aided Design (CAD) (optionally with the help of mentors). CELERE uses two-dimensional (2D) CAD software called DraftSight.

The CELERE 2015 Design Challenge is for students in grades 8-12, who may participate as individuals or in teams of any size. Teams may also include younger students as long as there is at least one team member in grades 8-12, where this option can facilitate the participation of informal science clubs, Scouts, etc. Youth are free to get help from adults, for example in creating their CAD drawing.

For more info: <http://spaceflight systems.grc.nasa.gov/CELERE/Overview/>

Imagination Station Educator Survey and Winter Opportunities

Your feedback will help Imagination Station to continually improve and provide the best possible experience for educators and students. Please take this survey whether you have visited Imagination Station or not. Once you complete the survey, you will be given a promo code so you can **enter to win a Kindle Fire HDX™!** [Take the survey.](#)



GUITAR: The Instrument That Rocked The World

Students can discover the science and history behind the instrument that revolutionized music: the guitar. Play the world's largest guitar, see more than 60 instruments ranging from the rare and antique to the wildly popular and investigate how different materials affect a guitar's sound. Included with admission to the science center.

www.imaginationstationtoledo.org

Alcoa Foundation MANUFACTURE YOUR FUTURE

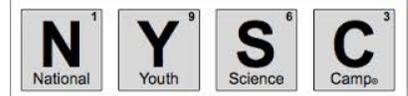
Educators can utilize these free resources for 6th-12th grade classrooms to develop key STEM and critical thinking skills in students. All resources are aligned to national education standards.

<http://www.manufactureyourfuture.com/educators>

National Youth Science Camp

Encourage students to apply to attend the **National Youth Science Camp** - <http://apply.nysc.org>

The National Youth Science Camp is a residential science education program for young scientists the summer after they graduate from high school. Students from around the country are challenged academically in exciting lectures and hands-on studies, and have voluntary opportunities to participate in an outdoor adventure program, gain a new and deep appreciation for the great outdoors, and establish friendships that last a lifetime.



University of Notre Dame Center for STEM Education

Trustey Family STEM Teaching Fellows for Middle Grades Teachers 5-8

University of Notre Dame is launching a new STEM Teaching Fellows program this summer focused on early career middle grade science and math teachers. The program's duration is 3 summers and 2 academic years and teachers must apply in teams of at least 3 people. The fellowship is fully funded and includes a \$6,000 stipend.

Teachers will gain: professional growth in STEM teaching, learning, assessment and leadership; a national community of practitioners within a cohort model; content specific instructional coaching; paid travel, lodging and meal expenses for summer institutes.

Please visit the website for more information: <https://stemeducation.nd.edu/pd-programs/trustey>

Toledo Zoo Inquiry Workshops for Grades K-12 Teachers

Participants will learn basic principles for conducting a life science inquiry with their students using the QUEST model. Working in groups, teachers will learn inquiry techniques by participating in guided inquiry lessons on days one and two. The series will culminate with teachers working in teams to perform an open inquiry utilizing animal exhibits at the zoo.



When - Thursday March 5, March 12, and March 19, 2015

Time - 4:30 - 7:00pm

Where - The Toledo Zoo, 2 Hippo Way, Toledo, OH

What - Applying life science inquiry lessons in the classroom

Who - Elementary teachers; Secondary Audience - middle and high school life science/biology teachers

Cost - \$85/person - includes light dinner, refreshments, instruction, and handouts for each of the 3 sessions and an outreach inquiry program for each participant's classroom (new zoo education program).

Contact Hours - 6 contact hours will be awarded at the conclusion of the series.

Of special note - The maximum number of registrants is 25, so register soon!

To register: www.toledozoo.org/professional

Questions, please email: **Mitch Magdich**, Curator of Education at the Toledo Zoo
Mitchell.magdich@toledozoo.org

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NWO Hands-On STEM Activity

This month's Hands On Activity is adapted from The Engineering Place, the North Carolina State University engineering school's preK-20 outreach program.

<http://teachers.egfi-k12.org/pipe-cleaner-towers/>

Pipe-Cleaner Towers

Hands-on Activity 4th and up grade students

Summary:

In this fun for all ages activity, students work in groups of 3-4 to design and build the tallest freestanding tower using teamwork and simple materials, while adjusting to changing constraints.

Grade Level: 4-12 (and older)

Time: 20-30 minutes, including 15-20 minutes for the activity

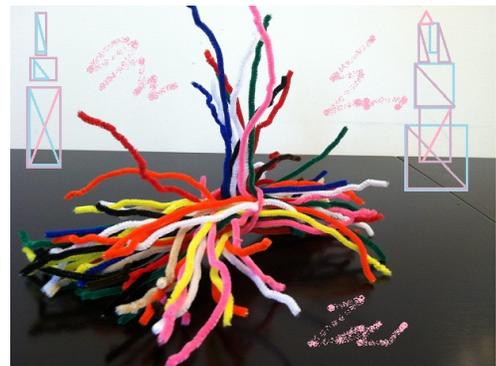
Learning Objectives

After doing this activity, students should understand:

- The concept of limited resources and constraints
- The importance of teamwork and communication
- The importance of planning a project

For the complete activity visit the website at <http://teachers.egfi-k12.org/pipe-cleaner-towers/>

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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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