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K-16 STEM in the NEWS**Science Program Keeps Evolving**

1,300 students from Perkins Local and Sandusky City Schools showcased grant-funded 'STEM' projects at Sawmill Creek Resort

Most children would be frightened by the sight of a buzzing honey bee zipping around their face. But not third-grader Aaron Welch. In fact, a new science project has helped him grow quite fond of the often misunderstood insects.



On Tuesday (May 30), Aaron and Tracy Plue, his teacher at Meadowlawn Intermediate School, shared their newfound knowledge of bees with hundreds of area children - especially their favorite facts about the "waggle dance," a fascinating maneuver honeybees use to communicate. Fellow third-grader Tyler Schultz chimed in with some valuable information, too. "If you leave them alone, they won't sting you," he advised.

More than 1,300 students from Perkins and Sandusky schools gathered at Sawmill Creek Resort on Tuesday (May 30) to showcase what they learned this year through the thriving iEvolve with STEM program. The STEM acronym stands for "Science, Technology, Engineering and Mathematics." The grant-funded program provides children with opportunities to collect and analyze data as "citizen scientists," while also collaborating with professional scientists in the field. Students in grades 3-5 participate, and data they gather will be submitted to real-world studies

This year's projects: monitoring area frog populations, analyzing the quality of local bodies of water, studying pollinators and rain gardens. Hancock

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Elementary School's frog-focused presentation was a popular spot Tuesday (May 30). While fourth-graders Rayce Klein and Emerie Morgan distributed information, crafty classmate Mackenzie Funni created and doled out paper



frogs. The trio said they all learned plenty this school year, thanks to their research project. "I think every school should do projects like this," Emerie said. "It's important to a lot of people."

The National Science Foundation awarded a \$7.28 million grant to Bowling Green State University main campus to fund iEvolve with STEM for five years, starting in 2012. It was one of only six such new awards distributed in the U.S. in the NSF MSP program fall 2012. Funding pays for all of the costs of transforming the way that students learn in grades 3-8 over a five year period. This involves student participation in science research becoming a central aspects of student learning.

These research projects are entirely hands-on, meaning students actually conduct real measurements and observations as a key aspect of the learning activities. Starting next school year, students will start publishing their findings online and in printed media. "This is real world stuff - real science that can have a real impact on our lives," said Bob Midden, a Bowling Green State University administrator, professor and the program's principal investigator. "Students aren't learning unrelated facts anymore. They're contributing to real research."

Partnerships with several entities support iEvolve with STEM, including The Ohio State University, the Erie Soil and Water Conservation District, Lourdes University, The University of Toledo, the Northwest Ohio Center for Excellence in STEM Education, the Toledo Zoo and Metroparks of the Toledo Area.

Photo Credits:

Top Photo: Register photo/LUKE WARK Greta Gross of Meadowlawn Elementary presents her group's project to fellow 4th and 5th-graders from Perkins and Sandusky schools Tuesday morning at Sawmill Creek Resort. Hundreds of students gathered to show off their projects, which were part of a grant-funded science program called iEvolve with STEM.

Bottom Photo: Register photo/LUKE WARK Osborn Elementary student Tanner Martin, right, along with his classmates Kealia May and Ronnie Lunsford present their project measuring the temperature of Mills Creek to fellow Sandusky and Perkins schools students on Tuesday morning at Sawmill Creek Resort.

This article reprinted with permission from the Sandusky Register with minor edits.

Community STEM in the NEWS

Kalida Teen Creates Prosthetic

New tech offers local boy a hand

Anne Coburn-Griffis, Sentinel Editor

Four years ago, the Putnam County Educational Service Center received grant funding for STEM (Science, Technology, Engineering, Mathematics) initiatives. Several county schools, including Kalida, received three-dimensional printers through that grant.

Dale Liebrecht, the Project Lead the Way (PLTW) Engineering teacher at Kalida High School, houses the school's 3D printer in his office so it can be used with 8-12 grade students for in-class projects. It has been used to make architectural models, parts for robots and other design components. This spring, Kalida senior Brent Hovest put the printer to work to help him assemble a prosthetic hand for a five-year-old boy from his community.



Leo Kortokrax was born with an upper limb deficiency: he is missing most of his right hand above the wrist. He and his family recently relocated from California to Kalida. Prior to the move, his mother Susan, a Kalida native, said his family had been exploring prosthetic hand options with Dr. Michelle James, Chief of Orthopedic Medicine at Shriners's Children's Hospital in Sacramento.

"Their experience at the time we discussed had been that children who, like Leo, have a fully functional hand and some portion of the other hand can do 95 percent of what a child with two hands can do," said Susan. "The problem with prosthetics in general for such children is that there is no sense of touch. Given the sensory issue and the cost for a "bionic" hand, we started with a very simple 'paddle' prosthetic that allows Leo to hold something by pressing his 'little hand' against a simple prosthetic 'paddle'."

This prosthetic allowed Leo to hold a small range of items, like a sheet of paper to a pencil or crayon. But one of the actions Leo most wanted to be able to do was hold a cup or drink to free up his other hand.

A traditional, professionally-made, muscle-actuated hand - one which can be outgrown quickly by a child - can cost between \$6,000 to \$10,000. And this sum is for a hand that is limited to simple tasks like gripping a water bottle, using two hands to ride a bike or swing on the swings or holding a baseball bat.

Then Kortokraxes learned about e-NABLE, a global network of over 4,000 volunteers who are using their 3D printers, design skills and personal time to create free 3D-printed prosthetic hands for children who are missing their fingers or arms below the elbow. Through the network, plans for a prosthetic hand can be downloaded for free.

Once the family had plans available at the click of a mouse, Susan approached Liebrecht about the possibility of the school using its 3D printer to print the parts for the "Cyborg Beast" a prosthetic hand designed by a team at Omaha, Nebraska's Creighton University. The teacher obtained the funding for the project and took it from there.

"When a community project like the prosthetic hand project comes through, I always make an effort to include students who I know have a high interest and abilities to complete the project. Brent learned about it and volunteered," said Liebrecht.

The cost was less than \$100 to download and print the design instructions, CAD files and for the plastic needed to output the parts in blue, Leo's color of choice.

With parts printed and Velcro available for strapping, Hovest ran into one minor stumbling block: He didn't know how to sew. Kalida secretary Nancy Grote said the student came into the office one day and asked for a lesson. She taught him how to whipstitch the wide black Velcro in place, assuring him that the thread wouldn't show.

Hovest worked on the prosthetic for about a month, with Leo coming into the school periodically for fittings. When Hovest discovered that the assembled hand's 'palm' was a bit slippery, he modified the design by adding padded and "gripping" surfaces, at his own cost.

After a final fitting on April 29, Leo was able to take the completed prosthetic with him. He was so excited that he showed it off to his cousins.

"Leo was able to hold a pop can after only a few tries," said Susan, adding that her son has also held walkie talkies and lifted buckets and backpack. "He is working on building up his wrist strength. We believe Leo was perfectly created."

Susan said that Leo's little brother Jon is obsessed with trying to get hold of the blue hand. Leo himself is excited about showing his classmates when he starts kindergarten this fall.

"This prosthetic is very a cool thing for a little boy," exclaimed his mother. "What little boy wouldn't like to show curious classmates a cool blue 'Cyborg Beast' hand?"

As for Hovest, he intends to take the experience and skills he used working on this real-life project and develop them further after high school at Rhodes State College. But that's not why he took on the challenge. "Just to see Leo smile," he said. "That's enough."

Photo Credit:

Six-year-old Leo Kortokrax is able to grasp and hold items like this bucket, thanks to the cool blue prosthetic hand created just for him by Kalida High School senior Brent Hovest. (Photo submitted)

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STEM Opportunities

Imagination Station Summer Camp here at BGSU

July 6-10



CATAPULTS, COASTERS, AND CARS! Summer Camp is coming to BGSU

This hands-on, creative experience gives you a first-hand look into the world of engineering. Build rockets, catapults, zip-lines, and even roller coasters using the Think It. Build It. Test It and Do It Again engineering philosophy.



Whether you're designing a catapult to fling marshmallows, launching water rockets or constructing a minty fresh derby car, you'll be using your imagination and engineering know-how to compete against other campers.

Campers receive:

- Daily instruction, 9am - 4:30pm
- Take home activities
- Camp T-shirt
- 2 snacks daily
- 3 complimentary admission tickets to Imagination Station
- Imagination Station's Extreme Science Demo on Friday, July 10

Age:

- Campers must be ages 7-12 (2nd-7th grade in fall)

Call **419.244.2674 ext. 250** or visit us online at imaginationstationtoledo.org/content/bgsummercamp/

Also - Imagination Station's Summer Camps - some spots still open!

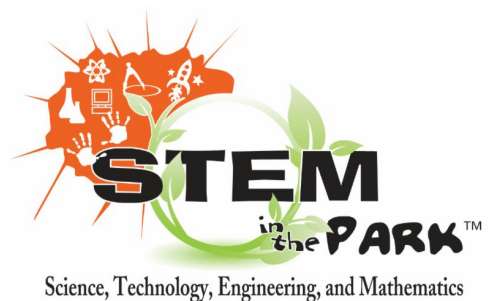
<http://imaginationstationtoledo.org/content/summercamp>

Join us for STEM in the Park!

Saturday, September 26, 2015, 10:00am - 2:00pm
in the Perry Field House @ BGSU.

A free event for all northwest Ohio families and the entire community. STEM in the Park features:

- Four hours of engaging, hands-on STEM activities from over 60 area businesses, schools and organizations,
- Free lunch and other refreshments (while supplies last),
- Free take-home activities,



- Free STEM materials, and best of all:
- Fun for the whole family!

Visit the website for more info at www.STEMinthePark.org

The Dragon Boat Summer Learning Festival

This annual Toledo tradition will be held on **National Summer Learning Day, June 20th, 2015**. The festival will serve as a showcase for summer learning programs. Summer Learning Day is a national advocacy day recognized to spread awareness about the importance of summer learning for our nation's youth in helping close the achievement gap and support healthy development in communities all across the country.



Partners In Education hosts the annual Dragon Boat Festival and race. Dragon Boat racing is a team water sport that is growing fast worldwide. The annual Toledo Dragon Boat Festival draws over 30 local businesses and organizations to participate with teams. Each team consists of a 25 person roster that includes 20 paddlers, 1 steersman, 1 drummer, and 3 alternates. The festival draws 700 paddle team participants, 100+ event volunteers, and 5,000 to 10,000 event spectators.

For more information about the Dragon Boat Summer Learning Festival and sponsoring a boat, please visit the website and contact Sommer Clayborne at sclayborne@partnertoledo.org

<http://www.toledodragonboat.org>

Ohio Mathematics Association of Two Year Colleges

Experimentally-Driven Mathematical Modeling Summer Institutes 2015

WHO CAN PARTICIPATE:

College and high school mathematics teachers who want to engage students in the application of mathematics through math modeling investigations.

WHEN & WHERE:

June 22-26 - Edison Community College from 8:30 am to 4:15 pm each day

And Fall Follow-up Meeting One day in October or November (TBA); follow up meeting will be held in October or November (TBD)

PARTICIPANT SUPPORT:

Summer Institute: \$1000 stipend for full participation in the 5 day institute

Follow-up Workshop:\$200 (or up to \$150 for release day) to attend follow-up.

For more information and the application form: <http://ohiomatyc.org/index.php?news&nid=7>

PROGRAM CONTACT INFORMATION:

Rodney Null (Rhodes State College, Math) and Beth Basista (Wright State University, Physics) will be the program facilitators.

Contact Rod at null.r@RhodesState.edu or call **419-995-8239**

Contact Beth at beth.basista@wright.edu or call **937-775-2954**

Battelle Education College Ready Math

College Ready Math is a year-long professional development experience for math educators led by math educators. To date, over 200 educators from urban, rural, and suburban schools across four states have participated.

BATTELLE Education

College Ready Math supports teachers in shifting their instructional practices while implementing the Math Design Collaborative (MDC) framework. The series is open to teams of math teachers (grades 6 through 12) and administrators interested in embedding formative assessment teaching practices using rigorous and real world math problems. Have questions? Email Kelly Gaier Evans: gaierk@battelle.org

Please see: www.BattelleEducation.org. for more information.

College Ready Literacy, another innovative training offered by Battelle Education is also available.

Applications for the 2015/2016 series must be submitted online and are due by June 26, 2015.

INFOhio's 4th Annual Virtual Boot Camp

Training to Survive the Zombie Apocalypse
August 4 - 5, 2015



INFOhio is hearing more and more reports of zombie-like students wandering the Internet aimlessly in search of any information they can feed off of! Educators are fearful that this disease is contagious and that a statewide epidemic is inevitable. It is imperative to attend **INFOhio's Training to Survive the Zombie Apocalypse** before an outbreak happens in your school! This two day boot camp offers nine tactical sessions, led by fierce, zombie combatant presenters, who will help you prepare for even the worst outbreak. You must arm yourselves now with today's cutting edge apps and resources and learn strategic moves to make your library and classroom environments a zombie-free zone!

See details and register: <https://www.infohio.org/educators/pd/bootcamp>

The Institute of Electrical and Electronics Engineers (IEEE)

The **IEEE Foundation** cultivates resources and relationships to foster technological innovation and excellence that benefits humanity. The foundation relies on donations to bring the excitement of scientific discovery to students, foster technological innovation, preserve history, and promote awareness of the long-reaching effects of engineering and its impact on humanity.

For 2015, the foundation will invest approximately \$400,000 to increase the understanding of technology and its critical role in meeting global challenges and improving the human condition.

Proposals are invited from IEEE organizational units for projects that inform the public about technical issues (such as, but not limited to, energy, healthcare, cyber security, internet governance, environmental change) for the purpose of fostering balanced factual discussion and understanding of a current public issue.

Grants ranging from \$5,000 to \$100,000 will be awarded in support of projects that result in the creation of materials and activities, including presentations and/or simulations that are suitable for secondary school/college students, secondary school teachers, IEEE groups, local community groups, and/or technology policy makers.

For complete program guidelines, information about grant recipients from previous years, and application instructions, visit the IEEE Foundation website at: <http://www.ieeefoundation.org/Grants>

Toledo MetroParks History Camp

At **Metroparks History Camp**, August 3-7, campers age 8 to 12 will learn how nature has helped to write history from the ground up. Campers will get to explore the canal at Providence with trips to the Isaac Ludwig Mill, Side Cut locks and other local historical destinations. This day camp meets from 9 a.m. to 4 p.m. each day at Providence. It's just one of the many camps available for all ages and interests. See the link for prices and other details about all of the camps.



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http://www.metroparkstoledo.com/metro/whattodo/index.asp?page_id=720

American Electric Power Classroom STEM Grants

American Electric Power is accepting applications from pre-K-12 teachers for mini-grants in support of classroom projects during the 2016-17 school year.

Through the Teacher Vision grant program, AEP will award grants of up to \$500 for projects designed to improve student achievement. Priority will be given to projects that promote science, mathematics, technology, electrical safety, the balanced study of energy and the environment, and energy efficiency.

Special consideration will be given to projects that incorporate matching funds, community resources, and interdisciplinary or team-teaching projects. Funds may not be used for stipends or meals.

A limit of one grant may be awarded per teacher per year. Grants may be limited to two per school per year.

To be eligible, applicants must be teachers of **pre-K through grade 12** who live or teach in the AEP service area or in a community with a major AEP facility.

For complete program guidelines and application instructions, see the AEP website.

<http://www.aep.com/community/TeachersAndStudents/TeacherVisionGrants.aspx>

Toledo Water Crisis - HAB on Lake Erie Summer PD Opportunity for Teachers

Join us for this Free STEM Institute to learn about water quality of Lake Erie and getting your students involved with observing water quality in the basin.

This program is in partnership with TMACOG's Student Watershed Watch

When: July 27-31, 2014 * 8 am - 4:30 pm each day

Where: University of Toledo Lake Erie Center, 6200 Bayshore Road, Oregon, OH

Who: Science, Mathematics, or Technology Teachers (grades 5-12)

Teachers will receive:

- PD on Water Quality Observing Techniques and Science, Geospatial Technologies and project-based science - aligned with Ohio Science, Mathematics, and Technology Content Standards
- \$700 of water testing equipment for your classroom
- Student involvement in field data collection and science conference
- Become a GLOBE teacher <http://www.globe.gov>
- Lunch and snacks will be provided each day

For more information contact Dr. Mikell Lynne Hedley, University of Toledo, 2801 Bancroft, MS#140, Toledo, OH 43606 or email to mikell.hedley@utoledo.edu

Schedel Summer Science Camp

July 20 @ 10:00 am - July 24 @ 3:00 pm | Free

The 2015 Schedel Summer Science Camp will be held from July 20-24 from 10am to 3pm. Registration is free and advance registration is required. Space is limited.

The goal of the camp is to give children entering middle school a leg-up on their studies in science and to spawn a passion for the understanding of our relationship to science and nature.

We recognize that as our society evolves and becomes ever more reliant on technology, the significance of science and nature in our



lives is waning. This is of ever increasing concern in the lives of our children who are becoming more and more tethered to electronics rather than valuing hands-on, real life experiences for both learning and stimulation -particularly when it comes to outdoor activities. Each participant should bring a sack lunch. Snacks and beverages will be provided.

Start: July 20 @ 10:00 am

End: July 24 @ 3:00 pm

Cost: Free

Venue: Schedel Arboretum and Gardens, 19255 W Portage River South Rd, Elmore, OH 43416 United States

<http://www.schedel-gardens.org/event/schedel-summer-science-camp/>

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Job Opportunities

Rossford Exempted Village School District Seeking A Fourth (4th) Grade Teacher

This position will be available for the 2015-2016 school year.

POSITION: Fourth (4th) Grade Teacher

BUILDING: Eagle Point Elementary School

DEADLINE: June 9, 2015

SALARY: Negotiable

START DATE: August 17, 2015

For more information download a full job description [here!](#)

Rossford Exempted Village School District Seeking A Fifth (5th) Grade Teacher

General Description: Help students to learn subject matter and skills, which will lead toward the fulfillment of their potential for intellectual, emotional, and psychological growth. Directs and evaluates the learning experiences of the students in activities sponsored by the school.

For more information download a full job description [here!](#)

Rossford Exempted Village School District Seeking A Middle School Mathematics Teacher

This position will be available for the 2015-2016 school year.

POSITION: Middle School Mathematics Teacher

BUILDING: Rossford Junior High School

DEADLINE: June 9, 2015

SALARY: Negotiable

START DATE: August 17, 2015

For more information download a full job description [here!](#)

NWO Hands-On STEM Activity

Ouch! Sunburn Science

Grade Level 2-8

What you need:

- UV beads (purchase through stevespanglerscience.com)
- Hand lenses
- Pencil/paper to record data
- Small plastic containers of sunscreen samples (3 different SPF sunscreens for each group labeled A, B, & C)
- Plastic bags, paper plates, trays (e.g., containers to hold beads)
- Markers
- A sunny day



What to do:

1. Divide the students into groups of three or four. Each group receives 12-20 UV beads and hand lenses.
2. Ask each group to use their powers of observation to determine what these objects might be. Have each group record their observations.
3. Have each group share their observations. Write down their collective thoughts on a white board.
4. Now, give each group about 5 minutes to take the beads outside in the sun and observe what happens.
5. Return to the classroom and record the groups' observations alongside their first thoughts on

- the board (use a T-chart format).
6. Tell the class that these are special photosensitive beads. Ultraviolet rays from the sun turn the beads color.

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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Find Even More Ohio STEM Education Resources

Visit our STEM clearinghouse, nwostemresources.org, for more STEM activities, programs, and information.

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