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## K-16 STEM in the NEWS

## Exciting S.T.E.M. Project at Vanguard Tech Center

The Vanguard Tech Center is putting to use as many different aspects of STEM as possible into one large project. It is a sort of STEM clearing house. This past Valentine's Day, the Precision Machining Class took orders from the student body as well as staff.

They designed and built key chains, necklaces, and bracelets. Using donated materials from local industry in the community, it has been a success educationally as well as professionally.



The areas the machining students covered were in such diverse STEM and 21st Century Skills areas such as:

- **Material Science** - corrosion testing
- **Mathematics** - calculating material cost
- **CAD/CAM** - Computer Aided Drafting and Manufacturing for custom shapes
- **Master Cam Programming** - telling the CNC (computer numerically controlled) machine what to do
- **CNC Machining** - precision cutting the parts
- **Laser Cutting** - real world experience taking a field trip to a local company to observe a laser cutting blank sizes out of stainless steel. This process helps increase production as opposed to milling.
- **Language Arts (LA) and Computer Software** - developing marketing strategies and using LA skills and software to design the order form, flyers, pre-order surveys, exit surveys. The students designed these pieces using Microsoft Word, Pagemaker, and Excel software.
- **Communications** - practicing good customer service skills by texting students when their orders are ready and problem solving for customers. This helps students see the good and bad side of running a business.
- **Character Building** - through the practice of good sales techniques, students sold products to the student body and staff. ([read more](#))

## Community STEM in the NEWS

## Science in a History Museum? Absolutely!

STEM learning opportunities are all over northwest Ohio and nowhere is that more evident than at our region's local history organizations. NWO is partnering with Sauder Village, Seven Eagles Historical Education and EARTH Center, Fort Meigs: Ohio's War of 1812 Battlefield & Museum and The Wolcott Museum Complex, home of the Maumee Valley Historical Society. These partners have developed exciting new programming that assists K-12 teachers with cross-curricular resources involving hands-on, inquiry-based activities that improve student understanding of social studies as well as science, technology, engineering and mathematics concepts. ([read more](#))



## STEM Opportunities

### Now Available - Rain Garden Sampler Loan Boxes!



The Rain Garden Initiative is pleased to offer educators two loan boxes containing activities and tools to assist them in exploring, designing and installing rain gardens with their students! The loan boxes were designed for use with the Rain Garden Curricular Sampler, a series of lesson plans for students in grades K through 12, developed by the Earth Stewardship for Schools Program of the University of Wisconsin-Madison Arboretum. The boxes are available from the Toledo Zoo Education Department and the Lucas Soil and Water Conservation District. A \$25.00 deposit is required, but \$20.00 of this deposit will be refunded when the materials are returned. The cost per use is only \$5. Contact the Toledo Zoo at **419-385-5721 ext. 2049** or the Lucas SWCD at **419-893-1966** to reserve a loan box. Check out the Rain Garden Curricular Sampler at

[http://uwarboretum.org/eps/research\\_act\\_classroom/rain\\_garden\\_curriculum.php](http://uwarboretum.org/eps/research_act_classroom/rain_garden_curriculum.php)

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### The Community Resources Workshop Returns

**Monday-Friday, June 18-22, 2012**

Plan to spend a week of your summer vacation on a fun-filled field trip for educators while you earn college credit or contact hours! This high-quality professional development program offers: standards-aligned and classroom-ready lessons, materials, programs and resources along with 40 contact hours from NWO at BGSU or 2 semester graduate credits through Lourdes University.

**Cost:** \$150 includes most meals (breakfast and lunch) as well as entrance fees, materials and 40 contact hours (provided by NWO at BGSU). Credit cards, school purchase orders or checks will be accepted as payment. Graduate credit is only an additional \$200 per credit hour. Click here <<http://nwocenter.org/CRW/RegInfo.htm>> for Registration Form and more information.

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### Summer Teacher Trip from Maumee Valley Historical Society

Join Us for a Trip to the Islands... Lake Erie's Gibraltar Island & South Bass Island... to commemorate the bicentennial of the War of 1812. Tour Gibraltar Island, Cook Castle & the Ohio State University's Stone Lab; tour the newly restored Perry's Monument at beautiful Put-in-Bay on South Bass Island; increase your knowledge of early American history (War of 1812) and science content (geology and environmental science); and earn 7 contact hours.

**Who:** Educators, administrators, and undergraduate students

**Date and Time:** July 25, 2012 from 10:00 am-5:00 pm

**Location:** Meet at Miller Ferry Line, 5174 E. Water St., Port Clinton, OH

**Cost:** \$50 (cost includes transportation fees, tour and admission fees, materials and contact hour certificates)

**Register:** Online at <http://www.wolcotthouse.org/Teacher.html>

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## Project Wingspan Grant FREE nature education programs available for Title I schools

Nature's Nursery, a nonprofit wildlife rehabilitation and conservation education organization located in Whitehouse, OH ([natures-nursery.org](http://natures-nursery.org)), recently received grant funding to cover the cost of presenting 35 of its nature education programs to Title I schools and nonprofit organizations that serve low-income children or youth with disabilities. The grant covers programs for the current school year. For more information or to schedule a program, please call Nature's Nursery at **419-877-0060**, and tell them you are interested in a "Project Wingspan" program. Programs will be booked on a first-come, first-served basis.



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## SAVE the Date for STEM in the Park 2012



**STEM in the Park 2012** will be held on **Saturday, September 8** from **10 am-1:30 pm** on the campus of Bowling Green State University. We expect to host over 50 STEM Activity Stations from a spectrum of NWO partners including Imagination Station, Scrap4Art, BGSU's Herpetology Lab, Challenger Learning Center and Wood County Historical Center. This family-friendly event features loads of hands-on STEM activities, free lunch and take home STEM resources. This is an opportunity to enjoy time with your family while networking with area STEM resource providers and discovering great activities for your classroom! Visit: [nwocenter.org/STEMinPark](http://nwocenter.org/STEMinPark).

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## Mathematics for Every Student: Responding to Diversity

In an effort to help teachers put the Equity Principle into practice, National Council of Teachers of Mathematics published a series of three books entitled Mathematics for Every Student: Responding to Diversity (Grades Pre-K-5, 6-8, and 9-12). The Ohio Council of Teachers of Mathematics encourage all teachers to order the book in the series that applies to your grade band.

You can purchase the books on the NCTM Website - <http://www.nctm.org/standards/content.aspx?id=16909> or download more information <http://www.ohioctm.org/Documents/Equity-Website.pdf>. If you have a suggestion, question, or desire to be involved in working on the Equity program, please contact **Mark Jaffee** at [markjaffee@oberlin.net](mailto:markjaffee@oberlin.net) or **Deb Gallagher**, [d-gallagher.2@onu.edu](mailto:d-gallagher.2@onu.edu).

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## Attend the ASEE North-Central Section Annual Conference

Ohio Northern University's T.J. Smull College of Engineering will host the 2012 American Society for Engineering Education (ASEE) North Central Section Conference on **Friday and Saturday, March 23 and 24** in Ada, OH. A new component has been added to this year's conference to help promote science, technology, engineering and mathematics (STEM) education at the K-12 level. The conference venue will also offer an opportunity for K-12 STEM educators to network, share best practices, and interface with potential higher education and industry partners

Online Registration is available at the conference website: <http://www.onu.edu/node/37941>

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## NASA's Women in STEM High School Aerospace Scholars (WISH) Program

WISH is seeking female high school juniors from across the country to participate in NASA's pilot project, which starts with an on-line community and culminates with a summer experience at NASA Johnson Space Center (JSC) in Summer 2012. More information is available at: <http://wish.aerospacescholars.org>.

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## Cleveland State University Call for School Partnerships on NSF Grant

This proposed project will investigate effective ways to transform how computer science is taught in the high school curriculum. If there are teachers, schools, or districts who might be interested in developing an AP Computer Science or an Introductory Computer Science course in your high school, please contact Debbie Jackson at CSU as soon as possible to be included in this proposal. The National Science Foundation's goal is to have 10,000 trained computer science teachers in 10,000 schools by 2016.

Debbie Jackson, Assoc. Professor of Teacher Education: Phone - 216.687.3753 or [D.JACKSON1@csuohio.edu](mailto:D.JACKSON1@csuohio.edu)

### NWO Hands-On STEM Activity

#### *Toys and Flight: A 5E Model Lesson*

*Recommended for Grades 2-5*

This lesson includes two additional handouts (Handout A & B), which are located at <http://www.nwocenter.org/handson.htm>

#### Engage

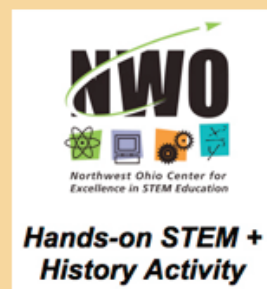


**Big Idea #1** - Gravity pulls things toward the earth.

#### Teacher

1. Take a wadded up piece of paper, hold it up, and let it drop.
2. Ask students: Can you describe what happened to the paper?
3. Write on board: gravity, velocity, speed
4. Take the same wadded up paper and a smooth sheet of paper, hold them both up, with the smooth sheet parallel to the ground. Ask the students to predict what will happen, which will hit the ground first. Let them drop.
5. Ask students: What happened? Possible answer - The smooth paper fell slower or at a lower velocity because of air. Define velocity and speed. Speed describes only how fast an object is moving, whereas velocity gives both the speed and direction of the object's motion.
6. Ask students: How do you think the air affects the paper? Possible answer: The air pushes on the paper in the opposite direction from which it is traveling.
7. Write on board: air resistance
8. Show students a rotor copter with one paper clip attached. What do they predict will happen when you let go of the helicopter? Demonstrate it.
9. Ask students: What happened? Possible answer - The helicopter fell toward the earth because of gravity and was slowed by air resistance or drag - especially because of the rotors on the top. Drag can be a useful force for slowing things down. A compact object experiences less drag and falls faster than an object of the same mass that is spread out.

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



### 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](mailto:nwo@bgsu.edu). We are always looking for great STEM education stories to feature in upcoming newsletters.

### Join NWO on [Facebook](#)

### Find Even More Ohio STEM Education Resources

Visit our STEM clearinghouse, [nwostemresources.org](http://nwostemresources.org), for more STEM activities, programs, and information.