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K-16 STEM in the NEWS**Ohio Student Participates in White House Science Fair**

"Good job Savannah!" so said President Barack Obama to Savannah Cofer of Gahanna, Ohio at the White House Science Fair held last month. Savannah and her teammates, presented their project, "FireArmor", which is protective apparel designed to protect firefighters or anyone who faces extreme temperatures.



The idea for creating such protective gear stemmed from a family hiking trip in Arizona that Savannah took with her family. What was a wonderful vacation was overshadowed by a tragic flash fire that took the lives of 19 firefighters in Prescott, Arizona. "We saw wildfires everywhere," Savannah said, and the tragedy impacted her enough that she wanted to find out how it happened and to perhaps do something about it. The results of her research indicated that protective gear and fire resistant materials that firefighters wear had not progressed much in the last 40 years. She then brought some friends together (Valerie Chen, Matthew Sun, and Varun Vallabhaneni), to conduct research on current fibers and why they weren't protective enough for a flash fire, the type of fire that abruptly took the lives of 19 firefighters that horrible day in Arizona three years ago. Savannah explained that the team started thinking about whether an endothermic chemical reaction like that used in instant ice packs could be used to offer a dramatic improvement in firefighter



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apparel. They developed their own protective fiber and named it "FireArmor" and entered the local 2015 Conrad Spirit of Innovation Challenge.

The entrepreneurial competition

challenges high-school students to use science, technology, engineering, and mathematics (STEM) skills to develop commercially viable, technology-based products that address real-world challenges.

According to the "Team FireArmor" thesis, FireArmor is an innovative protective apparel designed to protect firefighters or anyone who faces extreme temperatures. Unlike any protective apparel on the market today, FireArmor is composed of an inorganic, endothermic fiber that absorbs heat from its environment and keeps the firefighter safe even at dangerously high temperatures. Current firefighter turnout gear rapidly degrades above 300 degrees Celsius and provides less than six seconds of protection in flash fire conditions. In contrast, FireArmor keeps the firefighter safe even above 1000 degrees Celsius and provides up to five minutes of protection in flash fire conditions.

Their project earned "Team FireArmor" one of five winning places in the Conrad competition and an exciting trip to Washington D.C. with their families. They presented on the East Lawn of the White House and Savannah exclaimed, "It was really exciting! We were able to meet President Obama and walk around the White House library and take a lot of pictures." After all the attendees completed their presentations, they all gathered in the White House for a speech delivered by President Obama. Savannah described the experience as "very inspiring".

Savannah also wrote a paper on the research and presented it at the 2016 Ohio Junior Science and Humanities Symposium held at Bowling Green State University in March. Savannah earned 2nd place for "Investigation of a Novel, Endothermic, Inorganic Fiber to Improve the Temperature Performance of Fire-Resistant Apparel" and loved the experience. "It was my first time at OJSHS and it was really fun, I really enjoyed it." Savannah will attend Rice University in Houston next year and plans to major in mechanical engineering. "Team Armor" plans to stay in touch as they attend different colleges all over the U.S. and have applied for a patent and trademark for their invention.



*Bottom Right Photo: Savannah and her teammates pose with Bill Nye the Science Guy
Photos provided by Savannah Cofer*

Community STEM in the NEWS

Bestselling Children's Author Delights Crowd at Literacy in the Park

On Saturday, April 23, hundreds of children and their families attended the annual "Literacy in the Park"; a free, fun-filled event that explores the many different forms of literacy. Held for the first time at BGSU's Perry Field House, "Literacy in the Park" featured dozens of learning and literacy stations and two presentations from bestselling children's book author, Todd Parr. Todd Parr's books (over 40 and counting) offer a simple theme and message that it's okay to be different and make mistakes, that people should help preserve the Earth, be kind to others and thank their teachers every day. "His books remind us to be ourselves. That it's okay to be different," Tim Murnen, Interim Director of the BGSU School of Teaching and Learning, said as he introduced Parr to the audience. "His books remind us that everyone should wear underwear on your head at least once in your lifetime," Murnen said as he chuckled with a pair of boxers on his own head.



Children and their families enjoyed all different types of activities, and were treated to several different musical performances as well throughout the day. Nutritional literacy, emotional literacy, environmental literacy, digital literacy and others were represented with activities from the Toledo Zoo, PNC Bank, BGSU colleges and departments, Mazza Museum, Challenger Learning Center of Lake Erie West, Wood County and Toledo Lucas County libraries, and more. Prior to the event, literacy "packets" were distributed to area schools with teachers assigning students the "Todd Parr Challenge" - a unique concept developed by staff of the Martha Geisling Reading Center of BGSU's School of Teaching and Learning. The "Todd Parr Challenge" focused on four books that present themes of ideas to which all people can respond: *The Thankful Book*, *It's Okay to Be Different*, *It's Okay to Make Mistakes*, and *The Earth Book*. Teachers and their students were asked to engage with Todd's themes by creating their own page (or pages) of a book. Many enthusiastically responded and their pages were featured on a large video screen at the event.



Each year BGSU's "Literacy in the Park" celebrates and explores the role that different forms of literacy play in everyone's lives by welcoming children and their families from across Ohio and beyond. Todd Parr shared his enthusiasm for literacy by inviting all participants to look beyond their ordinary, everyday lives to see the unique opportunities that are presented.

One enthusiastic parent stated, "We LOVE Literacy in the Park! It is always such a wonderful opportunity to meet authors of children's' books. It really helps my children connect their reading with real-life authors. The experience of BGSU's Literacy in the Park sparks my children's interest in literacy and learning. Thanks for another great year of learning through one of our family's favorite events!"

Sponsors for the 2016 "Literacy in the Park" were the Joseph and Judith Conda family, BGSU, BGSU Foundation, PNC Bank, Biggby Coffee, Bostdorff's Nursery, NWO, Perrysburg Rotary Foundation, and the Wood County Libraries.

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STEM Opportunities

2016 Community Resources Workshop for Educators

Registration is now open for educators to enjoy a fun-filled week during the summer while earning college credit or 40 contact hours

Registration Fee: \$150

Deadline for registration and full payment is June 10, 2016

This opportunity is open to all educators including administrators, homeschooling educators, and pre-service teachers. This workshop is recommended for Pre K - 8 educators but is open to all grade levels.

For more information and to register visit: <http://www.thebladeineducation.com/>



OSU's Stone Lab Summer Courses Offered

OSU's Stone Lab classes for formal and informal educators and education majors are designed to garner excitement about teaching Great Lakes-based science lessons. Credits can be earned toward an undergraduate or graduate degree or as a non-credit workshop to earn continuing education units. (i.e., contact hours).

Field Geology for Educators: Geologic Setting of Lake Erie:

EARTHSC 5189.05

July 16 - July 22

Course details found here (<https://ohioseagrant.osu.edu/education/stonelab/courses/ospgo/field-geology-for-educators-geologic-setting-of-lake-erie>)

Group Studies: Water and Wildlife Training for Educators: ENR 5194

July 24 - July 30

Course details found here (<https://ohioseagrant.osu.edu/education/stonelab/courses/yq024/group-studies-water-and-wildlife-training-for-educators>)

Ornithology for Teachers: EEOB 4920

July 31 - August 6

Course details found here (<https://ohioseagrant.osu.edu/education/stonelab/courses/85wqm/ornithology-for-teachers>)



Ohio Young Birders Northwest Ohio Chapter

The Ohio Young Birders Club (for young people ages 12-18) is a program developed by the Black Swamp Bird Observatory (BSBO) to encourage, educate, and empower youth conservation leaders. Two daylong camps are offered during the summer:

Saturday , June 4th

9:30am - 1:00 pm

Summer Residents

Lake La Su An Wildlife Area

Pioneer, OH

Sunday, July 17th

9:00am - noon

Boats & Binoculars

with Metroparks of the Toledo Area



To register or for any questions, please contact:

Patty Toneff, Woodlawn Cemetery, patty.toneff@historic-woodlawn.com, 419-472-2186 or Robin Parker, Olander Park: rparker@olanderpark.com, 419.882.8313

For more information: www.ohioyoungbirders.org

Free Computer Science Trainings for Teachers from code.org

In 2013, the non-profit [Code.org](http://code.org) launched with a simple vision: "**every student in every school should have the opportunity to learn computer science.**" Now, the organization provides trainings, a library of course content, and political advocacy.

To expand access in Ohio, **Code.org** has selected **Battelle Education** as a Professional Learning Partner. That means Battelle Education, manager of the **Ohio STEM Learning Network**, will be organizing more trainings around computer science and coding.

Code.org is underwriting much of the cost, allowing teachers to attend at no or a reduced cost. The key requirement: Any school seeking training must be able to teach computer science as a standalone course in Fall 2016.

The first opportunity is a free summer training on high school Advanced Placement Computer Science with support for travel. For this training, the teacher must teach one or more classes in Advanced Placement Computer Science next school year. Teachers in schools that already have a partnership with **Code.org** can apply here: <https://goo.gl/BS1jCh>

If your school doesn't have a partnership, but you can commit to teach computer science next year, sign up on Code.org's waitlist.

<http://www.osln.org/2016/04/computer-science-trainings-for-educators-coming-to-ohio/>

Solar Curriculum Workshop

Please register for this workshop to learn 5 lessons on solar technology, recently developed to help middle and high school students learn about solar photovoltaic and solar thermal technologies. Educators attending the training will receive a \$75 stipend and a tote box of all materials needed to complete the lessons. The lesson plans are designed for both formal and informal education activities.

When: Wednesday, June 8, 2016

Time: 10:00 a.m. - 5:00 p.m.

Location: Ohio State University's Stone Laboratory

Cost: Free (limited availability)

Registration: <https://ohioseagrant.osu.edu/news/calendar/2016/06/08/hlkxk/solar-curriculum-workshop>

Elementary Science and STEM

Integrating Elementary STEM Activities into the Elementary Science Curriculum

An online elementary STEM course will begin June 5, 2016. The course will help educators understand and experience the integration of STEM lessons into the pre-K - 6 science curricula. It will conclude the week of August 12, 2016.

The course's sessions will include discussing the benefits of developing STEM literacy in school-age students; defining STEM; experiencing hands-on activities that serve as exemplars for integrating STEM concepts with academic standards for science; understanding how scientific inquiry and engineering design can guide implementing STEM projects in elementary science lessons; and reviewing resources for elementary STEM. Attendees will also develop their own integrated STEM lessons based on a science standard they teach at their grade level.

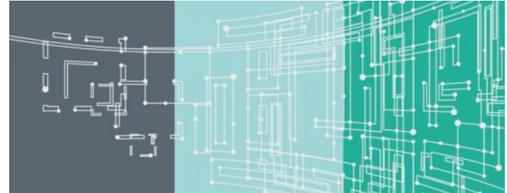
The course can be taken for non-credit for \$150 or for a semester hour of graduate credit through Ashland (OH) University for an additional \$175.

To register, go to <http://moodle.treca.org/greatpd/mod/page/view.php?id=387>. For more information, please contact Bob Claymier at bob@stemiselementary.com.

Modeling and Model-Based Reasoning in STEM Conference

This conference brings together cognitive scientists, STEM educators, discipline-based educational researchers and learning scientists to learn and discuss how modeling and model-based reasoning come into play in undergraduate education in science and engineering. Some of the talks will be devoted to the pre-college years, but the focus will be on undergraduate education.

The conference is limited to 100 participants with the goal of representing STEM fields broadly. Attendees are welcome to submit posters on any topic related to undergraduate education, and/or to cognitive scientists in the field of university education.



Learn more here: <https://polytechnic.purdue.edu/modeling-in-stem-conference>



Back by popular demand: INFOhio Beach Bags and the virtual Camp INFOhio offered for free to all Ohio families by INFOhio and the Ohio Department of Education.

The Beach Bags, for grades K-3, feature stories and activities that let children practice reading skills while learning about careers and their environment. This "beach bag," gives parents and teachers an easy way to help children practice their reading skills while learning about what it's like to be the President or other elected official.



<https://goo.gl/UFc4eI>

Cleveland State University's STEM Education Conference for High School Educators

Cleveland State University's 9th Annual STEM Education Conference for High School Educators is on **Wednesday, June 15th (8:30 a.m. - 3:30 pm)** and **Thursday, June 16th (8:30 - 12:30 p.m.)** in CSU's Julka Hall.

This **free conference** provides hands-on, interactive STEM lessons and activities that



will engage grades 9-12 students in the classroom. Presented by local educators, ideas and activities are constructed so students' interest and curiosity is piqued and further exploration in STEM content is generated.

See detailed agenda: <https://www.csuohio.edu/sciences/operationstem/stem-conference>

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NWO Hands-On STEM Activity

Milk Bubbles

This activity suitable for students in grades 2- 4 and explores the Next Generation Science Standards 2 and 5: Structure and Properties of Matter.

Ingredients:

- Two Transparent Glasses
- Skim Milk
- Whole Milk
- Two Straws
- Ruler



Instructions:

1. Fill one of the transparent glasses one-fourth of the way with skim milk. Fill the other transparent glass one-fourth of the way with whole milk. Is the milk a solid or a liquid and why? Describe the milk in each glass by using its observable properties.
2. Place a straw in each glass. At the same time, have a friend blow through the straw into one of the glasses of milk, while you blow through a straw into the other glass of milk and observe.
3. Using a ruler, measure the height of the pile bubbles produced from blowing through the straw into each glass. Which type of milk produced the tallest pile of bubbles? Using these measurements, describe the differences between the skim milk and the whole milk. Which milk would be better for creating a cappuccino and why?

Explanation:

The protein in the milk allows the bubbles to form a strong skin. While the whole milk creates some bubbles, the skim milk create more bubbles. The reason, the fat in the whole milk interacts with the proteins, which weakens the skin of the bubbles, allowing the bubbles to pop faster.

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

This lesson was shared with permission from Hooked on Science at www.hookedonscience.org

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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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