



## News Release

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For Information: Don Kennedy, 410-436-7118

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# ECBC Scientists Captivate Elementary Students at Harford County's Inaugural STEM Night

**Aberdeen Proving Ground, Md.** — Scientists from the U.S. Army Edgewood Chemical Biological Center (ECBC) participated in Harford County's inaugural Science, Technology, Engineering and Math (STEM) Night on Feb. 17, offering four separate interactive science experiences to more than 350 students and 300 parents at Youth Benefit's Elementary School (YBES).

"Our biggest goal was to spark students' and parents' interest in STEM and create excitement beyond what we can accomplish on our own," said Jason Parks, STEM Night coordinator and fifth-grade teacher at YBES. "The outcome of this event definitely exceeded anything that I would have envisioned, and the contributions of student volunteers and outside organizations like ECBC proved to be extremely valuable."

In an effort to relay the importance and excitement of STEM disciplines as early as the elementary level, nine ECBC presenters — sponsored by the National Defense Education Program — challenged students from kindergarten through fifth grade and their parents to engage in the application of STEM principles during hands-on activities.

ECBC Research Biologist Lalena Wallace and Research Microbiologist Mary Wade, Ph.D., used microbes as "unicellular sous chefs," demonstrating their use for cooking, baking and in the fermentation process of cultured dairy products, such as yogurt and cheese.

"Our goal was to show kids that microbes like bacteria, fungi and archaea are not necessarily bad, but that they can actually serve very useful purposes," Wallace said. "Students and parents that visited our booth were able to watch the fermentation process of yeast and how this powerful microorganism makes bread rise."

Wallace and Wade introduced YBES students to the scientific research of beneficial microbes, allowing them to manipulate a microscope to magnify images of organisms attached to the bottom of petri dishes.

"This was a very interesting method to teach children about organisms," said parent Gwen Tran. "It was especially useful to let them observe different microbes through the microscope."

Spreading their excitement for chemistry across the room, ECBC chemists Ken Collins, Ph.D.,

Michael Feasel and Terry Roop fascinated the audience with phenomena that at first glance appeared to be magic tricks.

"My name is Dr. Collins, and I'm a chemist at ECBC," Collins enthusiastically introduced himself. "I love my job and can't believe the government pays me to do all this fun stuff."

They engaged YBES students in experiments and the process of revealing scientific secrets, hidden behind seemingly magical demonstrations, with the intent to help them discover the fulfilling nature of STEM career pathways. "I love going to work, because we do something different every day," Feasel added.

Their series of experiments educated students about the effects of chemical reactions, temperature change, pressure displacement and polymer architectures. The audience visibly enjoyed watching fluid turn into slime, a wine-colored liquid transform into a milky liquid and liquid nitrogen quickly evaporate on the floor.

"The magic of science demonstration was so cool, but the goo was yucky," said first-grade student Haley Hardiman. "Overall, this experience was simply awesome."

"It was extremely interesting and very fun for adults and kids," Haley's mother Kerri Hardiman added. "I liked the interactive part of it a lot, and all of the kids wanted to participate."

The Center's environmental toxicologists Morgan Minyard, Ph.D. and Michael Simini, Ph.D. invited students to work with live earthworms that can be used to help determine soil contamination levels. This comprehensive STEM experiment familiarized students with basic research principles, while exploring earthworms' reactions to different environments.

"These kids are very intelligent," Minyard said. "I am quite impressed with how much they already know. They're definitely a smart bunch."

In the process, Simini encouraged students to use the scientific method, formulate a hypothesis and reiterated the importance of writing down their results. When adding water to petri dishes containing earthworms and then polluting the same environment with spicy mustard, students recorded observations that included earthworms' attraction to clean water and their avoidance of "contaminated" space.

"Crazy worms, crazy stuff, but I sure had a great time," nine-year-old Robert Fitzgerald commented on the earthworm experiment.

ECBC Microbiologist Amy Groth and Biologist Mindy Soethe literally shed light on the importance of regular and thorough hand washing procedures. Under the influence of glowing lotion and ultraviolet light, participants were able to recognize the existence and spreading of germs on their hands and objects like coffee cups, key boards and telephones.

In addition to suggesting effective hand washing methods to reduce the spreading of germs, the two female scientists brought laboratory equipment for students to learn and apply pipetting techniques that are critical for experimental work.

"ECBC is the best represented organization tonight and has consistently proven its commitment to STEM education," said Joan Michel, STEM coordinator for Harford County Public Schools. "The scientists did an amazing job at capturing students' attention with an array of exciting, but

relevant hands-on STEM experiences.”

“It’ll pay dividends, because these are the types of activities it takes to entice students to pursue STEM career pathways at an early age,” she added.

But, parents were also blown away by the caliber of STEM experiences provided by high school students and professional organizations, and they emphasized the relevance of events like these for their children’s and our nation’s future.

"It is great to see the engagement of government organizations like ECBC that are reaching out to their community and bringing scientists into the classroom," said student mother Mary-Beth Patterson, whose son is in fourth grade at YBES. "This is exactly what our nation needs, to grow stronger and smarter, not only militarily but also educationally. There is a future value in these types of activities, as they encourage our children to become the next innovators."

Focused to deliver students a spectrum of educational outreach opportunities, the Center’s Community and Educational Outreach Program Manager Mary Doak provided visitors a wealth of information on topics such as scholarships, internships and STEM-related programs across the Department of Defense.

YBES Principal Angela Morton attributes the strong turn-out for Harford County’s inaugural STEM night to students’ and parents’ interest in STEM and described the event as a successful starting point for future STEM activities at the elementary level.

"As the first of its kind in the county, tonight's event exceeded our expectations," Morton said. "The fact, that parents have already expressed their interest in coming back even though their children might move on to middle school, speaks to its tremendous success."

"We want to thank all participating volunteers and outside organizations for contributing their time, skills and knowledge," she added.

For more information about ECBC, please visit <http://www.ecbc.army.mil/>.

*ECBC is the Army’s principal research and development center for chemical and biological defense technology, engineering and field operations. ECBC has achieved major technological advances for the warfighter and for our national defense, with a long and distinguished history of providing the Armed Forces with quality systems and outstanding customer service. Located at the Edgewood Area of Aberdeen Proving Ground, Md., ECBC is a U.S. Army Research, Development and Engineering Command laboratory. For more information about the Edgewood Chemical Biological Center, please visit our web site at <http://www.ecbc.army.mil/> or call (410) 436-7718.*

**Photo Credit: Jennifer Carroll, U.S. Army Edgewood Chemical Biological Center**

**STEM 1: ECBC Toxicologist Morgan Minyard, Ph.D. helps Kevin Fitzgerald, 6, conduct earthworm experiments that helped introduce students to the basic principles of scientific research.**

**STEM 2: Teaching YBES students about the ways germs spread, ECBC Biologist Mindy Soethe exposes bacteria on a coffee cup to ultra violet light and makes them glow.**