



ANNUAL REPORT 2018



Fiscal Year 2018
(July 1, 2017 - June 30, 2018)

Connections • Communication • Collaboration

www.nwocenter.org

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Gabriel Matney	Faculty Associate
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Jenna Pollock	Education Program Manager
Judith Steiner	iEvolve with STEM Project Manager

NWO Mission

The Center's mission is to advance science, technology, engineering, and mathematics (STEM) education for people of all ages.

NWO Vision

The Northwest Ohio Center of Excellence in STEM Education at BGSU aims to advance science, technology, engineering, and mathematics (STEM) education for people of all ages. Our purpose is to work with community partners to (a) generate new knowledge about the science of teaching and learning, (b) apply this knowledge by developing the expertise of K-12 educators and higher education faculty, (c) increase public support for, and understanding of, the STEM subject areas, and (d) stimulate the interest of young people, especially those in underrepresented groups, in these rewarding fields of study and career opportunities.

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NWO GOALS AND CORRESPONDING ACTIVITIES



Goal 1:

Develop the expertise of pre-service and in-service teachers in STEM and STEM education disciplines.

Goal 2:

Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty.

Goal 3:

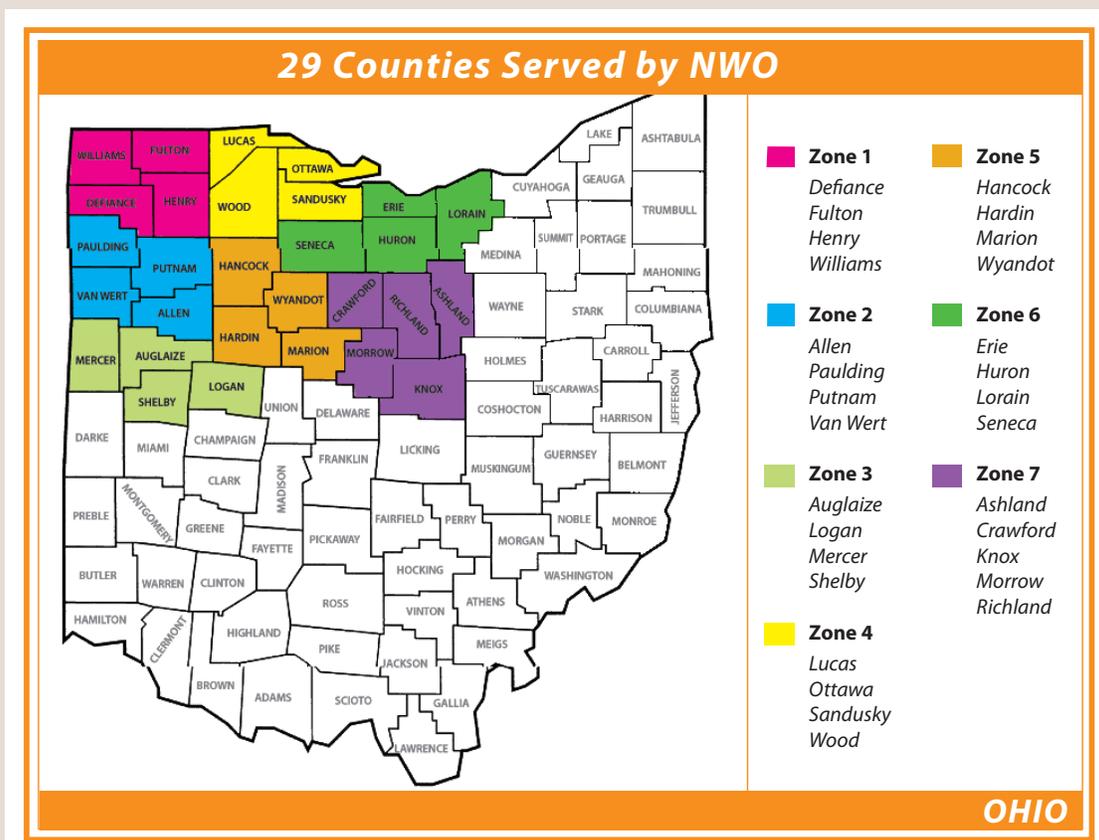
Conduct and communicate collaborative research in STEM and STEM education disciplines.

Goal 4:

Develop and sustain a regional collaborative alliance including university, school, informal education, and business partners through a shared vision and collaborative spirit for tackling current STEM education issues.

Goal 5:

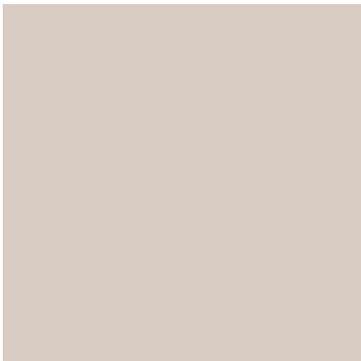
Support higher education faculty and future faculty in pursuit of the best practices in STEM and STEM education disciplines to enhance undergraduate and graduate education.



FY 2018 NWO Ambassador Board

Lisa Addis	Bowling Green State University
Beth Ash	Bowling Green State University
Melissa Basinger	Putnam County ESC
Jonathan Bostic	Bowling Green State University
Anne Bullerjahn	Owens Community College
Mary Caprella	BP
Cheryl Copeland-Shull	Springfield Local Schools
Emilio Duran	Bowling Green State University
Todd France	Ohio Northern University
Anjali Gray	Lourdes University
Gary Herman	Putnam County ESC
Stephanie Johnson	Battelle
Mitchell Magdich	Toledo Zoo
Sloan Mann	Imagination Station
Gabriel Matney	Bowling Green State University
Bob Mendenhall	Toledo Public Schools
Bob Midden	Bowling Green State University
Taryn Miley	Springfield Local Schools
Jan Osborn	Putnam County ESC
Matt Paquette	Lubrizol
Kevin Parkins	Cardinal Stritch Catholic High School
Julie Payeff	The Anderson's
Jenna Pollock	Bowling Green State University
Gwynne Rife	University of Findlay
Brad Rowe	SSOE
Eugene Sanders	Sandusky City Schools
Michelle Shafer	Maumee City Schools
Susan Stearns	Bowling Green State University
Joel Steinmetz	Lima City Schools
Jill Wasiniak	Sandusky City Schools

EDUCATOR PROFESSIONAL DEVELOPMENT AND OUTREACH



“NWO STEM Connection” E-Newsletters

The NWO e-newsletter is focused on bringing attention to new opportunities, programs and events happening in STEM K-16 education. Monthly e-newsletters feature stories about area K-12 schools with a focus on STEM learning. Each month also includes feature stories from community partner organizations detailing how business and non profit organizations are working with K-12 schools to enhance STEM teaching and learning. A hands-on, inquiry based STEM activity is also included for teachers to use in K-12 classrooms, upcoming teacher professional development and student opportunities and STEM resource announcements. The e-newsletter is distributed electronically to 8,000+ contacts within the NWO database covering regional school districts and their teachers and administrators. See Appendix C for an example of an e-newsletter for FY 17. **Meets NWO Goals: 1, 2, & 4**

NWO STEM Education Inquiry Series

Brief Description

Sustained professional development is offered by NWO throughout the academic year through the NWO Inquiry Series. The Inquiry Series is a series of STEM professional development workshops that continues to be highly popular with educators in the region. It also functions as a monthly platform for affiliated NWO grant projects and regional educators to come together for project-specific professional development. The Inquiry Series is open to in-service and pre-service teachers, higher education faculty, and business/community partners in the region. Participants can opt to attend only one event or all the Inquiry Series events. **Meets NWO Goal: 1**

FY 2018 Activity Information

In an effort to reduce the competition for recruiting STEM teachers in northwest Ohio, NWO once again partnered with an existing education project. This partnership allowed both parties to benefit from the professional development provided and offered a more streamlined list of opportunities for teachers in the region.

In 2017 – 2018, we continued our partnership with the Black Swamp – Math Teachers Circle (BS – MTC). This was a free program offered 6 times throughout the year for two hours each evening for math teachers in grades K – 16. The dates and attendance data for these meetings is listed below. See Appendix D for examples of the advertisement materials for this program.

Black Swamp – Math Teachers Circle (BS – MTC)		
Dates	Location	Attendance
September 11, 2017	Bowling Green State University, Bowling Green, OH	32
October 16, 2017	Bowling Green State University, Bowling Green, OH	37
November 13, 2017	Bowling Green State University, Bowling Green, OH	29
February 12, 2018	Bowling Green State University, Bowling Green, OH	20
March 12, 2018	Bowling Green State University, Bowling Green, OH	11
April 16, 2018	Bowling Green State University, Bowling Green, OH	25

NWO Symposium on Science, Technology, Engineering, and Mathematics Teaching (NWO Symposium)

Brief Description

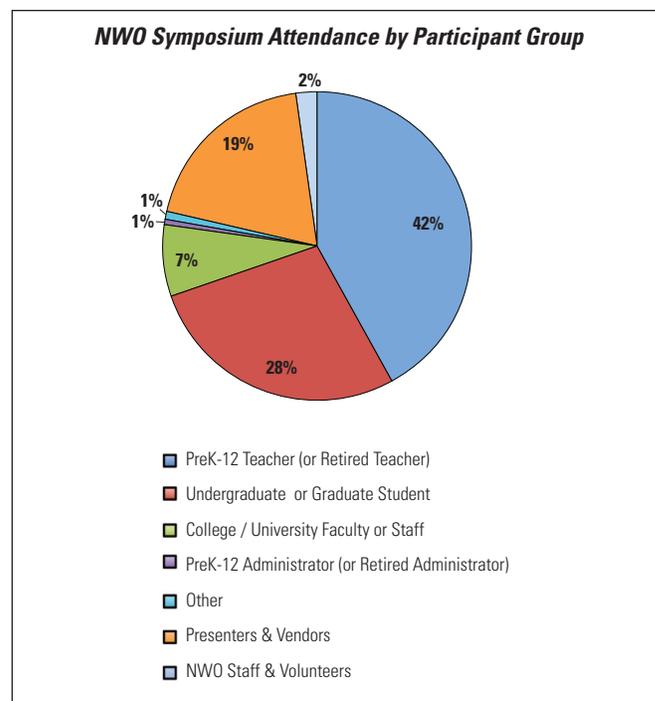
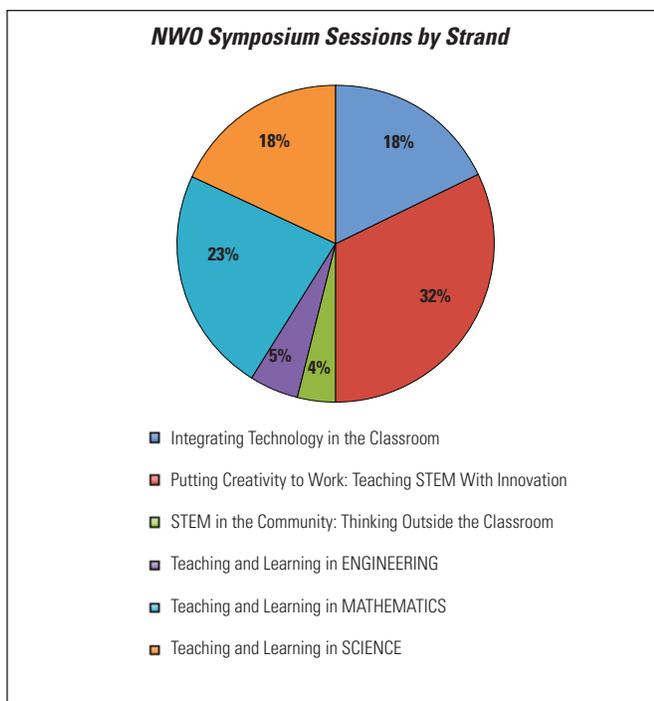
Over the past several years, the NWO Symposium has brought together hundreds of participants to exchange effective strategies for teaching STEM. This popular event has provided the Center with huge visibility in the community, attracting educators to our long-term professional development opportunities and giving all participants resources and ideas they can use immediately in their classroom or setting. **Meets NWO Goals: 1 & 5**

FY 2018 Activity Information

For the 2017 Symposium, the format was changed to move the keynote presentation to the lunch block. The keynote address was given by BGSU Associate Professor, Dr. Gabriel Matney and was titled: "STEM Learning: The Power and Promise of Developing a Conjecturing Modality". The schedule for the day is below.

8:00 AM – 8:45 AM	Registration	11:00 AM – 11:50 AM	Block C
9:00 AM – 9:50 AM	Block A	12:00 PM – 1:30 PM	Lunch & Keynote Presentation
10:00 AM – 10:50 AM	Block B	1:45 PM – 2:35 PM	Block D

A total of 44 sessions were offered at the 2017 Symposium after four sessions were cancelled due to scheduling conflicts or illness for the presenters. A registration fee of \$40 was charged to educators and administrators and a \$5 fee was charged to undergraduate and graduate students; presenters and one co-presenter remained free. Session strands continued to help participants determine what sessions were ideal for their personal professional development. Below is breakdown of the sessions offered by strand (44 total) and the overall attendance of 295. The evaluation report can be found at: www.nwocenter.org/reports. See Appendix E for examples of the advertisement materials for this program.



NWO Teacher Ambassador Board

Brief Description

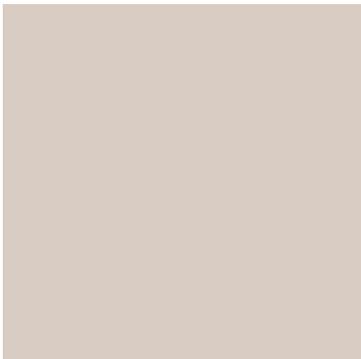
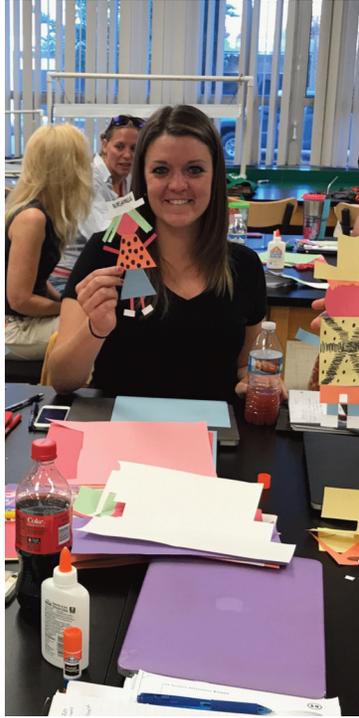
In FY 2017 NWO assembled a Teacher Ambassador Board (TAB) and invited many area educators to participate in this unique opportunity. We selected educators who are proven leaders in NW Ohio and who have been involved in and contributed to our programs. The goal of the TAB is to stay connected with the needs of the educators that we serve in order to guide future NWO programming and to continue to provide high quality programs in STEM teaching and learning. **Meets NWO Goal: 1, 2, 3, 4, & 5**

FY 2018 Activity Information

We held the second annual meeting of the TAB on February 20, 2018, with the objective of showcasing a new STEM designated school in our region, Hull Prairie Intermediate (HPI), and learning about their partnerships and STEM programming. Board members engaged in a Design Thinking activity facilitated by HPI's STEM Educator which took place in the 5th/6th grade STEM lab space. Discussions revolved around implementing Design Thinking in classrooms, needs in STEM professional development, beneficial STEM training, and ideal timing for PD opportunities/STEM events. Meeting attendees and their school district affiliation are listed below.

Name	School District(s) or Organization	Name	School District(s) or Organization
Jodi Anderson	Bowling Green City Schools	Zeb Kellough	Bowling Green City Schools
Kadee Anstadt	Perrysburg Schools	Stacey Kessler	Washington Local Schools
Nate Ash	Perrysburg High School	Penny Kidd	Maumee City Schools
Jennifer Baumgartner	Columbus Grove High School	Lexi Marshall	Bowling Green Middle
Kelisa Boden	Perrysburg Schools	Taryn Miley	Springfield Local Schools
Amy Boros	Perrysburg Schools	Adam Millikan	Miller City Schools
Cheri Copeland-Shull	Springfield Local Schools	Annie Nelson	Wood Co. ESC
Laura Davidson	Perrysburg Schools	Steve Oswanski	Toledo Public School - NSTC
Kristy DiSalle	Springfield Local Schools	Maria Pratt	Rosford Schools
Bryan Ellis	Toledo Public School - NSTC	Becky Puls	Maumee City Schools
Dana Falkenberg	Springfield Local Schools	Amy Ross	Washington Local Schools
Shannon Gladieux	Olentangy Local Schools	Megan Spangler	Rosford Schools
Jason Hubbard	Perrysburg Schools	Tina Ward	Washington Local Schools
Andrea Iman	Rosford Schools		

FACULTY PROFESSIONAL DEVELOPMENT AND COLLABORATIVE EDUCATION RESEARCH



COSMOS Research Learning Community

Brief Description

Faculty, graduate students, and others with a common interest in STEM teaching and learning come together throughout the academic year to collaboratively examine and design high tech and highly engaging environments to enhance student attitudes, motivation, engagement, and ultimately success. The learning community supports the overriding goal of enhancing STEM education for people of all ages. **Meets NWO Goals: 3 & 5**

FY 2018 Activity Information

This learning community was a continuation of the 'Understanding Student Motivation and Attitudes to Enhance Learning in STEM' community from the last two years. Motivations and attitudes about learning can influence student conceptual gains and course performance. The group continued to examine the fixed mindset versus growth mindset model for learners. For example, are there differences in motivation between high and low growth mindset individuals? To examine this question, the group administered selected scales from the Motivated Strategies for Learning Questionnaire (MSLQ) and Growth Mindset Assessment instruments to students in our classes. The group continued to develop and test a path model relating academic achievement to factors such as growth mindset, motivation, and study strategies. Results were presented at the BGSU Learning Summit and this research is being conducted with the goal that it will be suitable for publication.

Additionally, the learning community discussed the mathematics preparedness of our students and the mathematical concepts students need in order to succeed in our courses. Stemming from these discussions, a subset of the group has begun a collaboration with a research group at Berkeley who are developing and testing assessments to test college-ready mathematical thinking skills.

The 2017-2018 research faculty learning community was led by Dr. Kate Dellenbusch of the Department of Physics and Astronomy and Dr. Matthew Partin of the Department of Biological Sciences. The community consisted of 12 regular attendees and met consistently throughout the academic year.

COSMOS Team

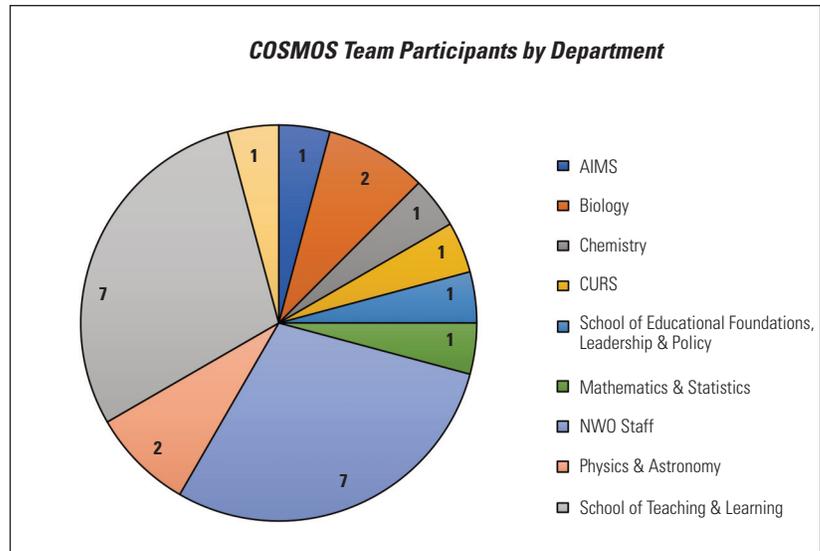
Brief Description

The Center Of Excellence in Science and Mathematics Education: Opportunities for Success (COSMOS), the BGSU branch of NWO, hosts the COSMOS Team meeting for BGSU faculty and administrators to work with NWO staff to communicate, collaborate, and champion STEM initiatives at BGSU and throughout the northwest Ohio region. This enthusiastic and supportive group has been meeting as a formal group for over 10 years and is committed to advancing STEM education for people of all ages. **Meets NWO Goal: 3**

FY 2018 Activity Information

Participation in the COSMOS Team demonstrates a diverse group of faculty participants from 5 university academic departments and 3 corresponding colleges (Arts & Sciences, Education & Human Development, and Technology, Architecture & Applied Engineering). Additional representatives from the AIMS (Academic Investment in

Mathematics and Science) and CURS (Center for Undergraduate Research and Scholarship) departments were also in attendance at each meeting. The team consisted of 24 total attendees and met once in Fall 2017 and once in Spring 2018.



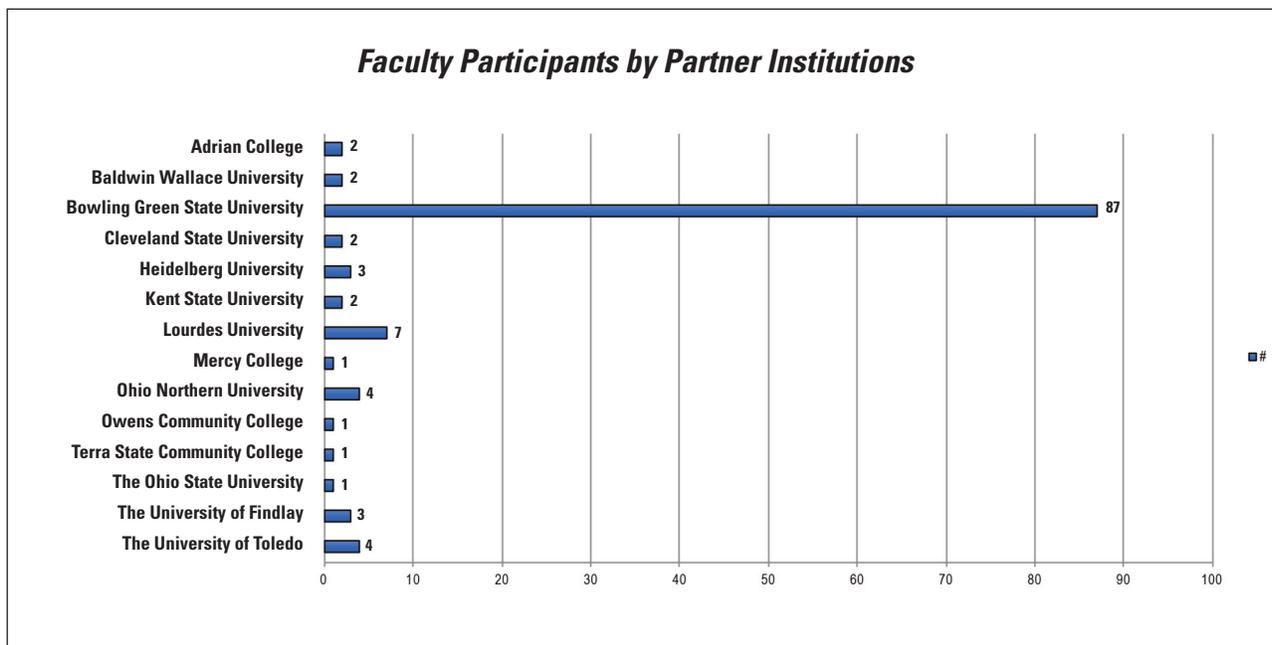
NWO Faculty Participants

Brief Description

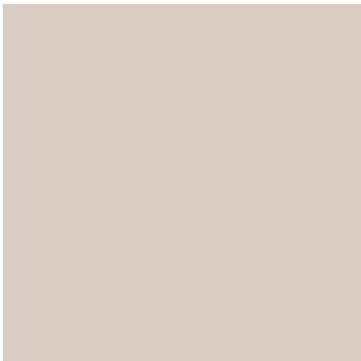
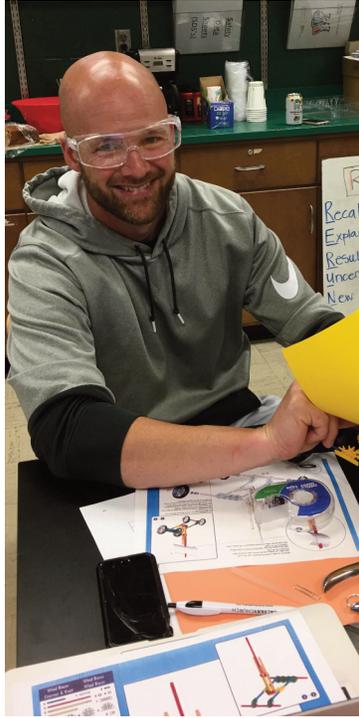
NWO has partners in colleges and universities all over northwest Ohio and southeast Michigan. These faculty assist NWO in many ways, including participating in and/or presenting at the following NWO events: (a) NWO STEM Education Inquiry Series, (b) NWO Symposium, (c) STEM in the Park, (d) OJSHS, (e) NWO Advisory Board, (f) COSMOS STEM Education Learning Community, (g) COSMOS Team, and (h) multiple NWO grant projects.

Meets NWO Goals: 3 & 5

FY 2018 Activity Information



GRANT PROJECTS



Advancing the Science Skills of Elementary Teachers and Students (ASSETS II)

Brief Description

Project ASSETS: Advancing the Science Skills of Elementary Teachers and Students is a collaborative partnership among many northwest Ohio school districts, the School of Teaching and Learning and the School of Intervention Services at BGSU and the College of Natural Sciences and Mathematics at the University of Toledo. The goals of ASSETS are (1) Improve the academic achievement of students in partnering school districts; (2) Develop deep science teacher content knowledge by facilitating professional development that uses active learning experiences and incorporates research-based best practices consistent with local, state, and national standards; and (3) Expose participating teachers to effective inquiry and 6E models and strategies for reaching diverse learners to improve science teaching and assessment. **Meets NWO Goals: 1, 3, 4, & 5**

FY 2018 Activity Information

During 2017-18 Project ASSETS Cohort 2 teachers participated in Phase 3 of the project where teacher participants implemented their 6E Model lesson plans developed during the summer workshop, in their classrooms. They observed their students' level of engagement as well as examined student knowledge gained through their work and responses to formative assessments. This cohort continued their professional growth by participating in other opportunities such as STEM in the Park and the NWO Symposium. Cohort 2 teachers shared their reflections and growth statements at the wrap-up meeting in April.

NWO Role in ASSETS

- Grant project management
- Financial management of the grant budget
- Instruction of grant professional development

Advancing the Science Skills of Elementary Teachers and Students (ASSETS+)

Brief Description

This project in collaboration with NASA and Batelle offered the Project ASSETS II teacher cohort an extension to science content professional development. In ASSETS II, teachers engaged in hands-on learning of the Life Science and Physical Science learning standards during the Summer Workshop. With NASA's support and expertise, these same teachers participated in inquiry-based sessions that focused on Earth/Space Science and facilitated in part by NASA educators during the academic year. Each session involved exposure to NASA resources and activities that are available for implementation in classrooms. **Meets NWO Goals: 1, 3, 4, & 5**

FY 2018 Activity Information

During the 2017-18 academic year, Project ASSETS+ sessions took place monthly and targeted Earth/Space Science themes and standards via 6E Model lessons. The sessions involved both individual grade level training as well as all grade level sessions. These sessions took place after school and were held at BGSU. Project ASSETS II Summer

Workshop facilitators returned to facilitate the sessions in partnership with NASA educators for the purposes of exposing students to NASA resources and activities which match Ohio’s Learning Standards in Earth/Space Science and the Engineering Design Process. The following are the content standards at each grade level in which Project ASSETS+ targeted.

Third Grade – Earth’s Resources

- Earth’s nonliving resources have specific properties.
- Earth’s resources can be used for energy.
- Some of Earth’s resources are limited.

Fourth Grade – Earth’s Surface

- Earth’s surface has specific characteristics and landforms that can be identified.
- The surface of Earth changes due to weathering.
- The surface of Earth changes due to erosion and deposition.

Fifth Grade – Cycle and Patterns in the Solar System

- The solar system includes the sun and all celestial bodies that orbit the sun. Each planet in the solar system has unique characteristics.
- The sun is one of many stars that exist in the universe.
- Most of the cycles and patterns of motion between the Earth and sun are predictable.

NWO Role in ASSETS+

- Grant project management
- Financial management of the grant budget
- Instruction of grant professional development

Army Education Outreach Program (AEOP): Support for Ohio Junior Science & Humanities Symposium

Brief Description

The Army Educational Outreach Program (AEOP) provided an opportunity through a strategic outreach grant project for students to conduct scientific research, analyze data, and present their work in the poster format of the Ohio Junior Science and Humanities Symposium (OJSHS). One of the goals of the grant project is to further the reach of students exposed to scientific research. The AEOP, in collaboration with Battelle, awarded grants to organizations and institutions to expand student participation in enriching STEM exploration and learning, particularly for underserved students. AEOP offers students and teachers Army-sponsored programs that effectively engage, inspire and attract the next generation of STEM talent. **Meets NWO Goals: 2**

FY 2018 Activity Information

200 students from the Natural Science and Technology Center at Toledo Public Schools and Springfield Local High School conducted original scientific research projects that were presented at the Ohio Junior Science and Humanities Symposium, a top tier symposium annually held at BGSU in March 2018. AEOP funding enabled the students to conduct research using the latest technology, collect and analyze research data, and ultimately present their work, gaining not only confidence and presentation skills, but research skills and engagement in STEM study, and exposure to STEM careers. The students presented their results in a poster showcase at OJSHS and received valuable critique and feedback from a panel of judges. The grant project was facilitated by BGSU faculty Dr. Emilio Duran, Associate Professor, and Dr. Jodi Haney, Professor Emeritus, and under their guidance, 11 teachers participated in professional development that included workshops to learn the mechanics of how to mentor their students to create a research project. See Appendix G for examples of recognition.

Common Core for Mathematical Proficiency in Elementary and Middle Schools ((CO)²MP Elementary and 6-8)

Brief Description

(CO)²MP is a Math Science Partnership project funded by the Ohio Department of Education. (CO)²MP is a collaboration between several northwest Ohio schools and Bowling Green State University's Colleges' of Education & Human Development and Arts & Sciences as well as the Northwest Ohio Center for Excellence in STEM Education. Through this partnership K-5 and 6-8 teachers from school districts in the Sandusky area will take part in professional development focused on the greatest areas of their students' mathematical content and mathematical proficiency needs. **Meets NWO Goals: 1, 3, 4, & 5**

FY 2018 Activity Information

This grant is a partnership between these K-12 school districts and Bowling Green State University's Colleges of Education and Human Development and Arts and Sciences as well as the Northwest Ohio Center for Excellence. Through this partnership 66 elementary school teachers from seven school districts in the Sandusky area (Sandusky City Schools, Toledo Public Schools, Imagine Clay Avenue Schools, Springfield Schools, Upper Sandusky Schools, Olentangy Schools, and Findlay Schools) took part in professional development focused on the greatest areas of their students' mathematical content and mathematical proficiency needs. Teachers met with the instructional team in person and via remote connections several times during the 2017 – 18 academic year and conducted two lesson studies (one in the Fall of 2017 and one in the Spring of 2018). The teachers concluded their work with an eight-day summer institute in June 2016. To culminate the lesson study learning the teachers presented one of their lesson study lessons at the Ohio Conference on Lesson Study for the Mathematical Proficiency of Students on June 20th, 2018 in Olscamp Hall, Bowling Green State University.

NWO Role in (CO)²MP

- Financial management of the grant budget
- Grant project management assistance

Inquiry and Engagement to Invigorate and Optimize Learning for Everyone (iEvolve) with STEM

Brief Description

The iEvolve with STEM project is funded by the National Science Foundation: Math and Science Partnership Program. This project is designed to transform teaching and learning in grades 3-8 of two moderate sized school districts by fully integrating the practice of science research throughout the curriculum, with the goal of substantially improving student achievement of Ohio science standards. The project also aims to improve undergraduate science instruction by increasing science and mathematics research faculty engagement with K-12 education. Building on past experience in prior NSF-funded work, this will increase awareness and appreciation of best practices in teaching among higher education faculty and will foster a greater commitment to improving the STEM pipeline as well as the effectiveness of undergraduate learning.

Based on nearly a decade of highly successful collaboration in STEM education research and reform and the experience gained from more than \$20 million of externally funded STEM initiatives, the key innovations in this project are: 1) students mastering rigorous state and national science standards by practicing science in national citizen-science research projects led by professional scientists and fully integrated into classroom learning; 2) participation of teachers and administrators for an extended 3-year period in a rigorous program of professional development as members of Professional Learning Communities; 3) teachers and students learning to lead through dissemination of their findings to their peers, to their communities, and to their profession; 4) implementation of best practices for differentiating instruction to maximize learning for all students.

The primary research questions focus on some of the most salient issues that STEM educators currently face: how student engagement and motivation relate to achievement of rigorous learning outcomes. NWO will examine how participation in citizen-science research affects these variables across the grades 3-8 range. NWO is working with nationally renowned Horizon Research, Inc. for evaluation of project outcomes.

Two cohorts of approximately 50 teachers will evolve through an intense 3-year professional development program involving more than 400 hours in direct contact, additional project activities, and research with their students, collaborating with more than 20 professional scientists in 5 different disciplines to accomplish sustained, transformational change in 3th-8th grade science instruction. The instructional innovations practiced by iEvolve teachers are expected to improve learning for more than 6,000 students in grades 3-8 during the 5 years of this project, and through the sustained transformation of these districts, tens of thousands of additional students will be affected. This impact is expected to increase as the influence of iEvolve teachers and students is spread throughout the region through their dissemination of their achievements.

This project is implementing strategies that have been previously found effective for increasing the engagement and success of all students, especially in high-needs schools like those involved in this project. A central theme of iEvolve will be differentiating instruction within all contexts so that every student participates, every student learns, and every student succeeds, as each one becomes a practicing scientist-learner. iEvolve teachers will use action research with the support of Professional Learning Communities to promote continuous improvement of their teaching. They will also learn how to disseminate their action research findings and their students' findings in their science research projects to their peers, their local communities, and their professions. Through

this dissemination they will influence the region, shifting the culture towards a greater level of engagement and interest in science discovery and innovation in education. Improving the quality and effectiveness of science education for all students will benefit our society due to higher economic productivity and better participation of citizens in democratic decision-making involving complex STEM issues. The project is led by NWO at BGSU with Dr. W. Robert Midden acting as the Principal Investigator. Project partners include Bowling Green State University, Erie Soil and Water Conservation District, Lourdes University, Toledo Area Metroparks, NWO, The Ohio State University: Stone Lab, Perkins Local Schools, Sandusky City Schools, The University of Toledo, and the Toledo Zoo. **Meets NWO Goals: 1, 2, 3, 4, & 5**

FY 2018 Activity Information

The second cohort of 37 middle school teachers from Perkins Local Schools and Sandusky City Schools completed their third year of their 3-year cycle of participation in the iEvolve project. This year was devoted to training teachers to use effective formative assessments for inquiry science and to disseminate student and teacher experiences in citizen science research. Noted author Page Keeley led two days of formative assessment training during the summer preceding the school year. Two additional days were spent planning citizen science research and dissemination activities. Lead scientists continued to work with students and teachers, representing several partner agencies, including the Erie Soil and Water Conservation District, the Metroparks of the Toledo Area, Toledo Zoo and The Ohio State University's Stone Lab. This year we added Erie Metroparks the list of partners to provide support to the school districts. Sixth grade classrooms continued soil studies and water quality work, while seventh graders studied vernal pool ecology, water quality and macroinvertebrates found in local streams. Eighth grade classrooms studied the pollinators found in native prairie, old field and garden environments. Except for the pollinator project, all other projects had the opportunity to enter data into NASA's GLOBE website, which also allowed for other data to be accessed from around the world. The pollinator project utilized eButterfly, Monarch Watch and Bee Watch for its databases. All students participated in student symposia, which provided opportunities for student researchers to share their findings with their local communities.

Another important part of project activities included cross-curricular work to connect each grade level's science themes to other content areas, as well as align to state learning standards. Project Based Learning units were created centered around each citizen science research project, with correlating formative assessments.

Although the first elementary cohort officially completed its 3-year cycle with the project a few years ago, due to continued interest and need, some supports were provided this year, including three evening sessions focused on formative assessment, continued citizen science research and dissemination. Many cohort 1 teachers continued to assist with teacher and student data collection, providing a rare chance to gather project data beyond the original three years.

This was the last year of the iEvolve with STEM project, but a no-cost extension granted by NSF will allow for more detailed analysis of student data, with the hope of better understanding the impact of student participation in citizen research on motivation and engagement in science.

Ohio Junior Science and Humanities Symposium (Ohio JSHS)

Brief Description

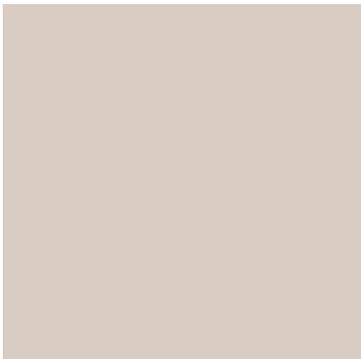
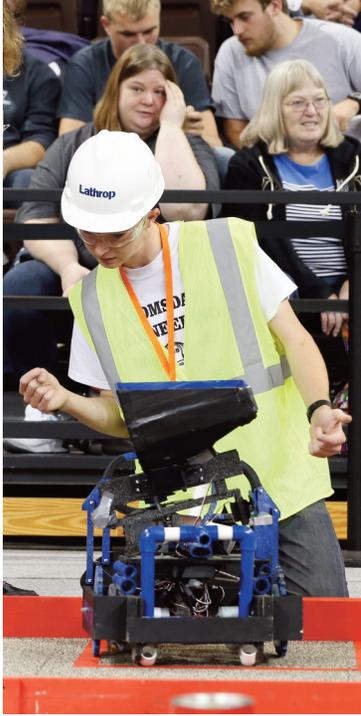
OJSHS brings some of the best and brightest students from Ohio middle and high schools together for a competition to highlight and judge the quality of their research projects in the sciences and humanities. This event is an excellent opportunity for the recruitment of the next generation of scientists, mathematicians, engineers, and teachers. OJSHS is co-sponsored by NWO and a grant from the Academy of Applied Science. Paper and poster presentations by these students demonstrate a level of achievement that would rival some of the very best junior and senior undergraduate students with some even approaching what is expected of beginning graduate students. Past Ohio winners have gone on to win the top award at the National competition, demonstrating the extraordinary talent and achievement of these students. **Meets NWO Goal: 2**

FY 2018 Activity Information

Bowling Green State University hosted the 3-day event for the tenth year in a row from March 14 – 16, 2018. This year marked the 55th Anniversary of the OJSHS program. Dr. Mike McKay, Ryan Professor of Biology and Director of the BGSU Marine Program, gave the keynote address. There were 24 paper presentations and 149 poster presentations. Arukshita Goel from Sylvania Southview High School was the 1st place winner for paper presentations. Arukshita along with 4 other OJSHS winners traveled to the National JSHS in Hunt Valley, MD in May 2018. A complete program and other information about the 2018 OJSHS can be found at www.ojshs.org. Below is a breakdown of attendance data for the 2018 Symposium. The 2018 OJSHS Evaluation Report offers a more thorough account of the implementation and impact of the event, and can be found at www.nwocenter.org/reports. See Appendix F for an example of recruitment materials and recognition.

Participant Group	Total Attendance for 2018
High School and Middle School Students	254
K-12 Educators	24
Higher Ed Faculty (Poster & Paper Judges)	56
Staff and Volunteers	15
Parents and Guests	12
TOTAL	361

SCHOOL AND COMMUNITY ACTIVITIES AND OUTREACH



Falcon BEST Robotics

Brief Description

The Falcon BEST Hub at Bowling Green State University is a proud participant in BEST (Boosting Engineering, Science and Technology) Inc. - a national organization that inspires middle and high school students to consider careers in science, technology, engineering, and mathematics (STEM) through participation in a sports-like, science- and engineering-based robotics competition.

However, BEST is more than just a robotics competition; it offers several opportunities for many students to be involved in different parts of the competition. The competition consists of an engineering notebook, robotics competition, spirit competition, marketing presentation, and display presentation with awards given for each of these aspects of the event. All of these pieces are combined to get the score for the overall “BEST” award. Because awards are given for these other aspects of the competition, students with a diverse array of skills are rewarded for their participation and thus a broader array of students benefit than from some other types of robotics competitions. Students who participate in BEST: (1) understand the practical use of math concepts and applied physics, (2) solve real-world science and engineering problems, (3) gain training that is transferable to all academic disciplines and career pursuits, (4) increase their interest in science, technology, engineering, and mathematics (STEM), (5) learn what engineers “do”, and (6) experience “design-to-market” product development.

The Falcon BEST Hub is a partnership between BGSU’s College of Technology, Architecture and Applied Engineering and the Northwest Ohio Center for Excellence in STEM Education. The Hub was created in 2013 and the first competition was held that fall. The top teams from the Falcon BEST Hub join teams from several other states at the Northern Plains Regional Competition each year. This is the highest level of advancement for BEST as a national competition does not exist. Each year a new Hub around the nation designs the competition for that year and each new year brings a completely new robotics task for the participating students. **Meets NWO Goals: 2 & 4**

FY 2018 Activity Information

The fifth annual Falcon BEST Robotics Competition was held in the fall of 2017 and started with 18 teams. The six-week competition called “Crossfire” started on September 16 with the Kick-Off for teams. At this event they received their robotics materials and got their first look at the robotics game. Teams had the next four weeks to work on their robot and other aspects of the BEST competition before participating in Practice Day on October 14. Practice Day allowed the teams to test out their robots on the game field and learn what others were doing and share ideas. The Falcon BEST Game Day took place in the Stroh Center on October 28. One team was not able to complete their robot before Game Day and as a result only 17 teams competed on Game Day. The first place “BEST Award” went to Maumee Valley Country Day team and the first place “Robotics Game Award” went to the team from the Millstream Career Center. The top teams performed well at the Northern Plains Regional BEST in Fargo, ND November 29 – December 1, 2017 with the following wins:

- Hamilton Southeastern High School: 3rd Place – BEST Award; 1st Place – BEST Engineering Notebook; 2nd Place – BEST Marketing Presentation; 1st Place – Robotics Competition Award; 3rd Place – Most Photogenic Robot; and 3rd Place – Best Team Website Award.
- Millstream Career Center: 4th Place – Robotics Competition Award; 2nd Place – Most Photogenic Robot; and Top Gun Award.

- Maumee Valley Country Day School: 1st Place – Most Photogenic Robot; 3rd Place – Best YouTube Video Award; and 3rd Place – Best Team Mascot Award.
- Cardinal Stritch Catholic High School: 2nd Place – Best Team Website Award and Team Exhibit Award.

This is by far the best showing the Falcon BEST teams have done at regionals bringing home a total of 14 awards, four more than the previous year. A full list of winners and more information about Falcon BEST and BEST robotics is available at: <http://www.bgsu.edu/technology-architecture-and-applied-engineering/college-overview/falcon-best-robotics-competition.html> See Appendix B for an example of recruitment materials and recognition.

Math Camp

Brief Description

Math Camp is an energetic and active day of teamwork, problem solving, and development of skills for K-12 students. Students engage in fun filled experiences about mathematics, the connections between mathematics and the real world, and mathematicians all in a camp atmosphere where there is song, dance, and silliness. 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. The camps are aligned with the Common Core and New Ohio Learning Standards for Mathematics. The BGCTM preservice teachers work with each school's liaison to identify specific areas of mathematical need for the students in order to design a worthwhile and focused camp experience. Camps are conducted for one grade level at a time to ensure that the mathematics tasks are targeted to the specific needs of the students attending the camp.

Research has shown that students who attend BGCTM Math Camp's demonstrate statistically significant improvement in their mathematical self-efficacy, are more comfortable with mathematics, and become more flexible in their problem solving strategies. **Meets NWO Goals: 1, 2, 3, 4 & 5**

FY 2018 Activity Information

The 2017 Collegiate Training Camp took place at Imagine Clay Avenue School in Toledo, OH, October 27 – 28 with around 60 college students in attendance. A total of six K – 12 camps were held during the 2018 spring semester; Sandusky on January 20, Napoleon on February 10, Perrysburg on February 24, Imagine Clay and Bowling Green on March 24, and Ottawa Hills on April 7. The six K – 12 camps were each organized and enacted by teams of college students who were trained at the fall training camp.

NWO Role in Math Camp

- Financial management of the camp funds
- Assistance purchasing materials for camps
- Advertising assistance

Brief Description

STEM in the Park is a free NWO event for all northwest Ohio families and the entire community to stimulate public interest and encourage learning in science, technology, engineering, and mathematics (STEM). Held on the campus of Bowling Green State University, the event features five hours of engaging hands-on STEM activities from over 100 area businesses, schools, and organizations along with a digital collection of take-home STEM activities for parents and children to continue STEM exploration at home. By increasing awareness of STEM facilities, programs, and activities in the area, STEM in the Park is an opportunity for businesses, universities, K-12 schools, and non-profit organizations to showcase innovation, educational opportunities, careers, and to promote positive attitudes toward STEM teaching and learning. **Meets NWO Goal: 2**

FY 2018 Activity Information

The Eighth Annual STEM in the Park event was held on September 23, 2017 and showcased 179 hands-on activities from 123 unique activity station providers from many northwest Ohio community and business partners and university departments.

This year's theme was 'Get Your Wheels Turning With STEM'. New zones in 2017 included the All Wheels Zone, featuring The Right Direction and sponsored by Thayer Dealership as well as the Robotics Zone. The most popular zone of 2017 was the Robotics Zone. A crowd favorite, the STEM Stage, entertained families with super-sized demonstrations by The Toledo Zoo and Imagination Station.

Once again a free hot lunch was provided for all participants and catered by Tony Packo's. Presenting Sponsors for the event were BGSU, BP, First Solar, Lubrizol Foundation, PPG and Verizon. Community Sponsors included NWO, Perrysburg Rotary, SSOE, Thayer Family Dealership, The Andersons and the Toyota Dealer Match Program. General Sponsors included Children's Discovery Center, Columbia Gas of Ohio, Glass City Federal Credit Union, Partners in Education, and Wal-Mart. In-kind donations were provided by Biggby Coffee, Bostdorff's Greenhouse, Carolina Biological, Costco, Lowes, and Tony Packo's.

The event was held at the Perry Field House for the seventh consecutive year. The attendance was the largest to date, with a approximately 5,500 attendees/exhibitors/staff/volunteers. The event attracted families from more than 115 different cities and towns in Ohio and Michigan. A complete list of exhibitors as well as a video and pictures of the event is available at www.STEMinthepark.org. See Appendix H for examples of the advertising and recognition.

Women in STEM

Brief Description

Women in STEM is an outreach and engagement program that exposes sixth through eighth grade girls from the region to STEM education and professions. The program goal is two-fold as it (1) aims to connect high impact and fun-filled STEM-based activities to the real world while (2) inspiring students to pursue higher education and careers in STEM fields.

The annual Women in STEM program is held on BGSU’s main campus to give students the experience of the college setting. Scores of dedicated BGSU students and staff members volunteer to escort students around campus and share their collegiate experiences. Additional information can be found on the NWO website at <http://www.bgsu.edu/nwo/programs/women-in-stem.html>. **Meets NWO Goal: 2**

FY 2018 Activity Information

The 2017 Women in STEM program was held on the Bowling Green State University main campus on October 31st. In an effort to reduce the number of sessions needed and the lunch lines, student registration was restricted to 300. As a result of this plan, fewer schools were able to participate and the lunch areas were less crowded. The program attracted 418 people, including 39 chaperones/teachers, 78 session presenters, 11 staff/volunteers/guests, and 290 sixth – eighth grade students. A program fee of \$20 was charged for all student attendees and chaperones. BP sponsored free registration and travel grants for underserved and/or low-income schools in Ohio to attend. The keynote activity was provided by Imagination Station.

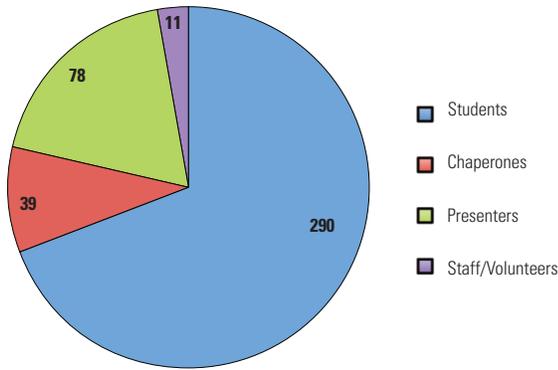
Students remained in their school groups and each group engaged in multiple program activities including the opening remarks, an engaging keynote presentation, and three hands-on, fun-filled STEM-based workshops. The schedule for the day is below.

8:30 AM – 9:00 AM	9:05 AM – 9:45 AM	9:55 AM – 10:40 AM	10:50 AM – 11:35 AM	11:45 AM – 12:30 PM	12:40 PM – 1:25 PM	1:35 PM – 2:00 PM
Check-in and Welcome	Keynote Activity with Imagination Station	Session 1	Lunch (students split)	Lunch (students split)	Session 4	Closing Remarks & Admissions Raffle
			Session 2 (students split)	Session 3 (students split)		

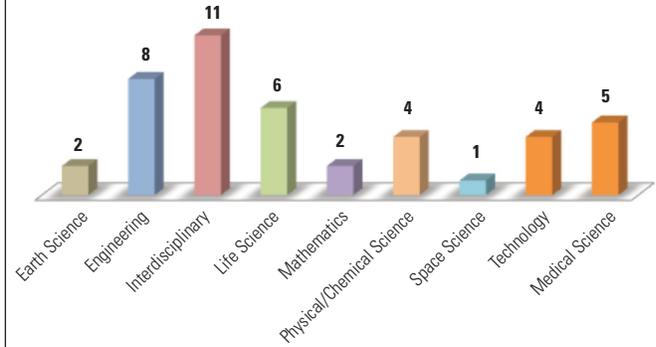
Many dedicated BGSU staff members and students volunteered their time and shared their experiences in STEM education and employment with the middle school girls throughout the day. Seventy-eight STEM professional role models from BGSU faculty, students and the surrounding community organizations facilitated the hands-on workshops.

Below is a breakdown of the sessions offered by content area and the overall attendance (418). Many sessions were offered more than once during the day. The evaluation report can be found at www.nwocenter.org/reports. See Appendix I for examples of advertising.

Women in STEM Attendance by Participant Group

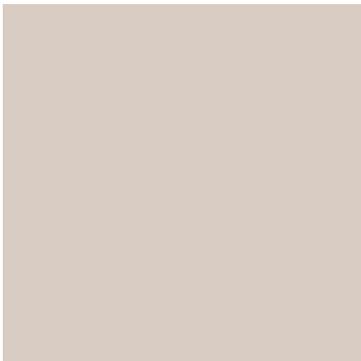
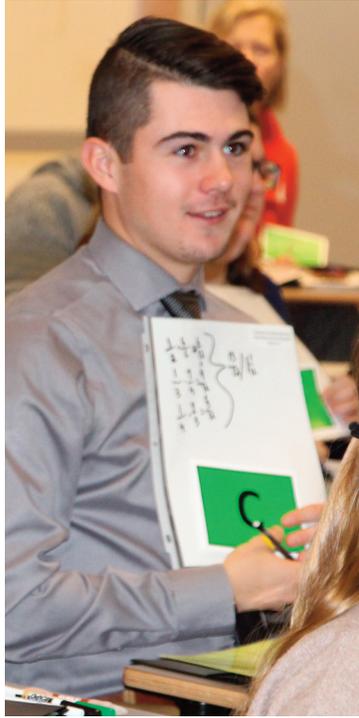


Women in STEM Sessions by Topic



**Northwest Ohio Center for
Excellence in STEM Education**

STUDENT SCHOLARSHIP PROGRAMS AND GRANTS



Academic Investment in Mathematics and Science (AIMS)

Brief Description

The Purpose of the Academic Investment in Math and Science (AIMS) Program is to increase the number of women and students of color who graduate from BGSU with majors in Science, Technology, Engineering & Mathematics (STEM), and who proceed to get terminal degrees in their fields then ultimately perform cutting-edge research and/or teaching.

All AIMS Scholars have a unique array of resources to help them strengthen their academic skills and to increase their likelihood for academic success in college, by developing professional leadership skills required for advancement in mathematics and the sciences. The AIMS Program requires study leading to a bachelor's degree in STEM related fields or teacher education with majors in these areas. The AIMS program has three scholarship packages with distinct requirements. The AIMS Standard scholarship is traditionally awarded to women and students of color with STEM majors. The AIMS BOSEF scholarship targets Ohio residents majoring in the following programs: chemistry, physics, biology, geology, environmental science, applied mathematics, engineering technology and those students with career goals related to renewable and sustainable energy. The AIMS MEDNURA scholarship targets Ohio residents majoring in such programs as: biology, chemistry, physics, applied mathematics, and various other health care related majors, who are also interested in learning more about becoming primary care physicians in urban and rural areas. More information about AIMS can be found at www.bgsu.edu/aims.html.

Meets NWO Goals: 1, 2, & 3

NWO Role in AIMS

- Oversight and management of the project including financial management of the budget
- NWO Director also serves as the AIMS Director
- Assist in the management of scholarship awards and renewals
- Assist with student advising
- Assist with academic mentoring and support

Collaborative Research: AGEP-T: Northern Ohio AGEP Alliance (NOA-AGEP)

Brief Description

With support from the National Science Foundation, the Northern Ohio Alliance for Graduate Education and the Professoriate (NOA-AGEP) was created to increase the number of underrepresented minority students completing science, technology, engineering, and mathematics (STEM) doctoral degrees and to prepare them for entry into the professoriate. NOA-AGEP is a collaborative effort among seven universities in Northern Ohio. The fall 2016 NOA-AGEP Scholar cohort will serve as a model for ongoing research to improve underrepresented minority student participation, preparation and success in STEM graduate education, an approach that, hopefully, can be exported nationally. Each year, NOA-AGEP Scholars receive a stipend enhancement, travel allowance to attend a research conference, and opportunities to participate in professional development activities/community building events (e.g. academic coaching, mentoring circles, NOA-AGEP research symposia). See Appendix H for examples of recognition. **Meets NWO Goals: 1, 2, & 3**

NWO Role in NOA – AGEP

- Develop marketing materials for BGSU doctoral programs that could qualify for NOA-AGEP
- Develop and manage BGSU's NOA-AGEP website and email account
- Plan a Summer Bridge event for all NOA-AGEP scholars and mentors
- Oversight and management of the project including financial management of the budget

Building Ohio's Sustainable Energy Future (BOSEF)

Brief Description

BOSEF is a scholarship project funded by the Choose Ohio First program of the state of Ohio. BOSEF increases the recruitment, training, and graduation of STEM students to supply the growing job markets in renewable energy and sustainable environment technologies. Northwest Ohio has a growing reputation for research, development, and manufacturing in the high technology, renewable energy fields of photovoltaics (PV) and wind. In addition, northwest Ohio has major research and development strengths in environmental analysis and remediation technologies. The University of Toledo (UT), and Bowling Green State University (BGSU), work together to leverage the enormous public interest and burgeoning job markets in these fields to recruit, educate, and retain the best and brightest of Ohio's students to support these rapidly developing high tech professions. Student success is enhanced through a summer bridge program focused on mathematics, undergraduate research experiences for all, and integration with the Wright Center for PV Innovation and Commercialization, the Lake Erie Research Center, Center of Photochemical Sciences, and the Environmental Remediation and Restoration Experimental Park. It prepares students for scientific and technical careers by providing internships with business, industry, agencies, and non-profits in renewable energy and environmental sustainability fields. Although the primary program focus is on the undergraduate STEM pipeline, it also includes masters and PhD students. The participating institutions have a comprehensive and vertically integrated approach to STEM education that maximizes student success and provides skilled professionals in these crucial STEM areas. **Meets NWO Goals: 2 & 3**

NWO Role in BOSEF

- Oversight and management of the grant project including financial management of the grant budget
- Direct recruitment of students through AIMS and the chemistry and physics departments at recruiting events
- Advertisement/recruitment to ~ 4,300 regional K-12 contacts
- Advertisement/recruitment at NWO Inquiry Series
- Management of scholarship awards and renewals
- Career development
- Student advising
- Academic mentoring and support

Meeting Essential Doctor Needs in Urban and Rural Areas (MEDNURA)

Brief Description

MEDNURA is a scholarship project funded by the Choose Ohio First program of the state of Ohio. MEDNURA increases recruitment, training, and graduation of students interested in becoming primary care physicians in urban and rural areas within the state of Ohio. It prepares students for medical careers by providing exposure to various aspects of the medical field and guidance in regards to the medical school journey including but not limited to, discussing the types of experiences which will be beneficial in preparation for medical school, preparing for medical and professional school applications, and volunteer opportunities. Student success is enhanced through participation in the AIMS summer bridge program focused on STEM education and discussion of the skills necessary to be an academically successful student during their undergraduate experience. BGSU has a comprehensive and vertically integrated approach to STEM education that maximizes student success and provides the skills students need to successfully gain acceptance into such in this critical needs area within the medical field. **Meets NWO Goals: 2 & 3**

NWO Role in BOSEF

- Oversight and management of the grant project including financial management of the grant budget
- Direct recruitment of students through AIMS and other BGSU recruiting events
- Informing approximately 8,000 educators and administrators in the region and across the state about the opportunities MEDNURA represents for their students
- Publicity and recruitment at NWO events
- Management of scholarship awards and renewals
- Career development
- Student advising
- Academic mentoring and support

Science and Math Education in ACTION (ACTION)

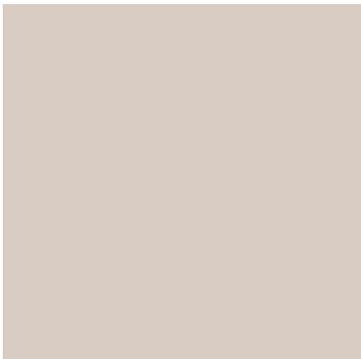
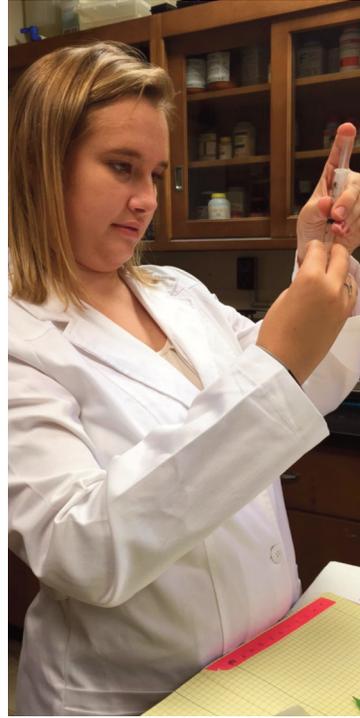
Brief Description

BGSU received \$505,722 in funding for the 2017-18 academic year from the Ohio Board of Regents through the Choose Ohio First program to recruit and train undergraduates to become Ohio mathematics and science teachers. Similar levels of funding are expected in subsequent years. ACTION focuses on the use of innovative strategies for preparing highly effective science and mathematics teachers for grades 5-12. Students involved in the project participate in: (a) a 4-week summer bridge program preceding the first regular semester of college; (b) a collaborative science or mathematics research team that addresses a real community problem or concern; (c) a co-op or internship work experience in a regional science or mathematics related business or industry in their second year; (d) early teaching experiences in a regional school; and (e) the creation of a capstone project that involves applying research techniques to determining the best teaching practices that advance the students' learning. **Meets NWO Goal: 1, 2, & 3**

NWO Role in ACTION

- Assistance with the undergraduate research component of the project
- Assistance and advice for project activities and logistics

RESEARCH PROGRAMS AND GRANTS



Identifying the Best Strategy to Reduce Phosphorus Loads to Lake Erie from Agricultural Watersheds Survey of Local Sources of Nutrients in the Upper Portage River Watershed (Sea Grant)

Brief Description

BGSU is working with Heidelberg University on this project with the goal of identifying the best strategy to reduce phosphorus loading to Lake Erie. In an effort to accomplish this, BGSU will sample subwatersheds of the Portage River using automated sampling equipment and sensors to collect empirical water quality and quantity data. The samples will be analyzed for all standard nutrient analyses, including soluble reactive phosphorus (P), total P, nitrate, total nitrogen, and ammonia. Sampling results will be evaluated to identify potential sources of high levels of nutrients. **Meets NWO Goals: 2 & 3**

NWO Role in Grant Project

- Reviewed geography of Portage River Watershed and determined that sampling should start upstream of the main branch of the Portage River.
- Identified initial sites (three in the North Branch, two in the Middle Branch and one in the South Branch) close to the start of the main branch to start monitoring and obtained permission from landowners to use sites. Data from each branch will be analyzed for significant differences and used to plan future sampling.
- Collected samples at each site following a rain of 0.5 inches or more and analyzed for nutrient levels.

Mitigation of Agricultural Nutrient Loss by Novel Manure Treatment (OWDA)

Brief Description

Through an Ohio Water Development Authority (OWDA) Research and Development (R&D) Grant, Bowling Green State University is collaborating with the United States Geological Survey (USGS) on a research project to develop and field test dairy manure dewatering treatment processes. BGSU is testing different dewatering dairy manure treatments for their abilities to slowly release nutrients; these laboratory studies are ongoing. The treatments typically involve a combination of coagulants and polymers. To test these treatments in a pilot field setting, BGSU assembled a team of collaborators that included The Ohio State University Agricultural Research and Development Center (OARDC) Northwest Agricultural Research Station (NWARS) in Wood County and the City of Ottawa, Ohio. The OARDC-NWARS offered the use of pilot test plots for application of the treated dairy manure and the City of Ottawa offered the use of their wastewater treatment plant for treating the dairy manure.

The project is funded in two phases, both done at the NWARS site—phase 1 is to test and install equipment and determine baseline nutrient and runoff conditions; phase 2 is to test treated manure compared to raw manure on plots, analyze samples for nutrients, and compute nutrient loads in surface and tile samples. An additional R&D proposal was submitted to OWDA in June 2015 and funds were secured for phase 2. Phase 1 was conducted from FY 2015 to FY 2017. Phase 2 was started in FY 2017 and will continue in FY2018. **Meets NWO Goals: 2 & 3**

NWO Role in Grant Project

- Conduct lab-scale experiments to develop manure treatment protocol.
- Evaluate treated manure as a slow-release fertilizer.
- Collect and analyze runoff water samples from test plots during significant rain events.
- Evaluate the flow profile of test plots to understand similarities and differences in plots.

Ohio Lake Erie Commission: Evaluation of Runoff from Manure Treated Agriculture Plots

Brief Description

The Lake Erie Protection Fund (LEPF) Grant supplements another grant to study the effectiveness of manure treatment in reducing nutrient amounts in runoff. When the original project was proposed, the test plots for the research were expected to be very similar in grading and nutrient content. However, differences in the plots were discovered and required modifications delaying the pilot test study. The LEPF grant has allowed for more runoff sampling since the plot modifications were made. The LEPF grant has also allowed for further development of the treatment protocol for the manure. When the treatment was originally being planned, slaked lime was used to treat the manure. As the research progressed, it was discovered that the slaked lime, if used at all, would be used at a different time in the treatment process. This discovery has led to the testing of new treatments. With the LEPF grant more lab-scale testing is being done on the new treatments. The LEPF grant has also funded undergraduate research students, as well as, consumable supplies and use and maintenance of already existing lab equipment. **Meets NWO Goals: 2 & 3**

NWO Role in Grant Project

- Conduct lab-scale experiments to optimize manure treatment protocol.
- Evaluate test plot runoff water samples and flow during significant rain events.
- Hire and supervise undergraduate students to assist with research activities (10 hours per week total).

Validity Evidence for Measurement in Mathematics Education (V-M²ED)

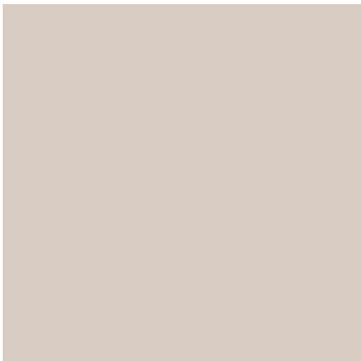
Brief Description

Validity Evidence for Measurement in Mathematics Education (V-M²ED) is a National Science Foundation conference grant. It was aimed at examining validity-related measurement issues germane to mathematics education and to set a clear pathway for scholars to discuss quantitative measurement within mathematics education. V-M²ED funding began September 2017. Jonathan Bostic (PI; Bowling Green State University) and Michele Carney (co-I; Boise State University) convened 35 scholars from around the world in San Antonio, Texas on April 2-3. Further work from this conference funding may include publications, working groups at other conferences, a book, or other professional collaborations. **Meets NWO Goals: 1, 3, & 5**

NWO Role in Grant Project

- Management of the project including financial management of the budget
- Support in planning and organizing the conference supported by this grant

FY 2018 NWO BUDGET

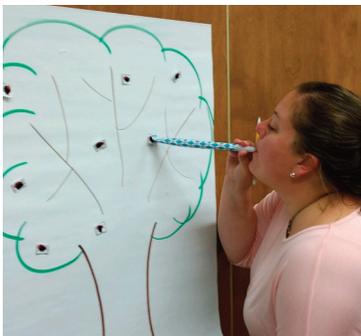
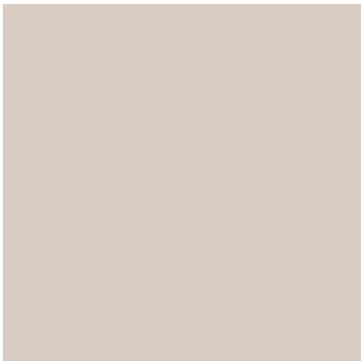


The table below shows funding provided by Bowling Green State University for FY 2018.

BGSU FUNDS	
Agency: Program	Award Amount
Bowling Green State University Fiscal Support for NWO	\$208,083.00

The table below shows funding sources that supported FY 2018 NWO Activities.

GRANT PROGRAMS		
*Funding amount listed is for the grant award period which could be longer or shorter than the NWO fiscal year.		
Agency: Program	Description	Award Amount
Academy of Applied Science	Ohio Junior Science & Humanities Symposium	\$20,000.00
Battelle Memorial Institute – Army Educational Outreach Program (AEOP)	Support for Ohio Junior Science & Humanities Symposium	\$199,998.00
Battelle Memorial Institute – NASA GRA	Project ASSETS+	\$14,000.00
National Science Foundation	Collaborative Research: AGEP-T: Northern Ohio AGEP Alliance (NOA-AGEP) (Year 3 of 4)	\$46,450.00
National Science Foundation	Developing and Evaluating Assessments of Problem Solving (DEAP) (Year 1 of 4)	\$307,081.00
National Science Foundation	iEvolve: Inquiry and Engagement to Invigorate and Optimize Learning for Everyone (Year 6 no cost extension)	2017-19, total funding \$7,277,348
Ohio Department of Higher Education	Advancing the Science Skills of Elementary Teachers and Students (ASSETS II)	\$100,582.56
Ohio Department of Higher Education	BOSEF: Building Ohio’s Sustainable Energy Future (Continuing Students)	\$38,000.00
Ohio Department of Higher Education	BOSEF: Building Ohio’s Sustainable Energy Future (New Students)	\$58,125
Ohio Department of Higher Education	Survey of Local Sources of Nutrients in the Upper Portage River Watershed (Year 2 of 2)	\$33,759.00
Ohio Department of Higher Education	Tracking and Attenuating Nutrient Loads from Manure Fertilization	\$210,723.00
Ohio Department of Education	Common Core for Mathematical Proficiency in Elementary and Middle Schools ((CO)2MP Elementary and 6 – 8) (Year 4)	\$629,031.04
Ohio Department of Higher Education	Meeting Essential Doctor Needs in Urban and Rural Areas (MEDNURA)	\$48,540.00
Ohio Water Development Authority	Mitigation of Agricultural Nutrient Loss by Novel Manure Treatment #1 (Year 4 no cost extension)	2017-20, total funding \$230,154
	Mitigation of Agricultural Nutrient Loss by Novel Manure Treatment #2 (Year 3 no cost extension)	2017-21, total funding \$199,626
OSLN/Battelle Foundation	Battelle Hub Grant	\$25,000.00



**We wish to thank the following for their support of
NWO activities during FY 18!**





APPENDICES



A: Faculty, Staff, and Student Recognition

B: Falcon Best Recruitment & Recognition

C: NWO STEM E-Newsletters Sample

D: NWO STEM Inquiry Series Advertising Samples

E: NWO Symposium Advertising & Recognition

F: OJSHS Advertising & Recognition

G: Army Education Outreach Program (AEOP): Support for Ohio Junior Science & Humanities Symposium Recognition

H: STEM in the Park Advertising & Recognition

I: Women in STEM Advertising

Appendix A: Faculty, Staff, and Student Recognition

FORMULA FOR SUCCESS: MATH EDUCATION FACULTY EARN TOP GRANTS

Bowling Green State University / News / 2017 / October / Formula for success: Math education faculty earn top grants



Gabriel Matney (left) and Jonathan Bostic

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Two Bowling Green State University math education faculty were recently awarded coveted grants to help teachers in northwest Ohio learn new strategies to address their students' mathematical proficiencies and measure their math problem-solving abilities.

Drs. Jonathan Bostic and Gabriel Matney, both associate professors in the *School of Teaching and Learning*, were awarded a \$1.5 million grant from the National Science Foundation (NSF) for their project *Developing and Evaluating Assessments of Problem Solving (DEAP)*, which will allow them to develop and deploy a set of measures for children in grades 3-5 to assess their problem-solving skills related to the math content they learn in schools.

"Problem-solving is important, and so we should be testing it in a reliable way," said Bostic, who served as the principal investigator on the grant with Matney and former BGSU faculty member Dr. Toni Sondergeld, now at Drexel University.



They have partnered with several local school districts, including Napoleon, North Central, Sylvania City and Springfield Local Schools, to roll out the assessments, which build upon the grant-funded work they have already done creating similar measures for students in grades 6-8. They will work closely with teachers in these schools to ensure there is a robust reporting system and pipeline for ideas and feedback to flow from the classroom to them and back.

"Testing should be part of the learning process," Bostic said. "Hence, we continue to partner with school districts in order to design the best valid and reliable measures for students and teachers."

In addition to the NSF grant, the Ohio Mathematics and Science Partnership also awarded them nearly \$700,000 for their *Common Core for Mathematical Proficiency in Elementary Schools - [CO]2MP* project, which will help provide professional development training to teachers throughout northwest Ohio that is aimed at helping students' in all grades levels improve their overall mathematics proficiency.

Through the training, teachers will gain improved knowledge of the math proficiencies expected by state curriculum standards, allowing them to create learning environments that better enable their students to meet these proficiencies.

"Students need opportunities to develop good mathematics habits in early grades," said Matney, the grant's principal investigator. "This training is important because it gives teachers the opportunity to sit down and look at what these proficiencies mean for their students and how they can adapt their teaching to help them meet these standards."

The teachers will get at least 128 hours of professional development - the equivalent of about three graduate level courses.

"That matters because research has shown that effective professional development needs to be long-lasting and meaningful for it to be effective," Matney said.

These latest grant awards build on the stellar track record of Matney and Bostic, who have been funded on 10 out of 10 grants they've submitted in recent years.

"We're quite thrilled by both recent awards," Bostic said. "Ultimately, these grants help so many students, teachers, education professionals and families."

"These are great examples of the impact the institution is having on improving education in the state," said Dr. Dawn Shineau, dean of the *College of Education and Human Development*.

TENURE, PROMOTION GRANTED BY TRUSTEES

Bowling Green State University / News / 2018 / May / Tenure, promotion granted by trustees



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The University celebrated the scholarly and creative achievements of 43 faculty members on May 4 when the board of trustees awarded promotion and tenure.

The trustees also approved the hiring as associate professor with tenure of Dr. Neil Baird, for the English department. Baird joins BGSU from Western Illinois University, where he is an associate professor and director of the University Writing Center.

Faculty promoted to full professor:

- Dr. Neil Englehart, political science
- Dr. Gabriel Matney, School of Teaching and Learning
- Dr. Wei Ning, mathematics and statistics
- Dr. Jeanne Novak, School of Intervention Services
- Dr. Kurt Panter, School of Earth, Environment and Society
- Linda Rich, library teaching and learning
- Dr. Nancy Spencer, School of Human Movement, Sport and Leisure Studies
- Dr. Mikhail Zamkov, physics and astronomy

Appendix A: Faculty, Staff, and Student Recognition cont.

Thursday, October 12, 2017

ZOOM news

BOWLING GREEN STATE UNIVERSITY

New Collab Lab is 'idea accelerator' | Falcon Hockey to drop puck on weekend's Homecoming festivities



Deneva Goins, Immersive computing strategist at HP, leads an Applied Design Thinking Workshop at the Collab Lab.

NEW COLLAB LAB IS 'IDEA ACCELERATOR'

Have an idea? Bowling Green State University's new [Collab Lab](#) is "the place to get it out of your head and into something tangible," said director Dr. Jerry Schnepf, who is also an assistant professor in the [College of Technology, Architecture and Applied Engineering](#). High tech, low tech and even no tech — the results come from the creative input of diverse minds, experience and expertise in a process guided by the principals of Design Thinking.



Jerry Schnepf, Collab Lab director

While continuing to provide all the services as its former incarnation as the Student Technology Assistance Center (including free 3-D printing), the new, walk-in resource on the first floor of Jerome Library offers expanded and expansive opportunities for collaboration among faculty and staff who either have an idea they would like to explore or a problem they need to solve.

"We're here to foster collaboration among faculty, staff, students and community members," Schnepf said. "Just having smart people is not enough. You need cross-disciplinary input. We're here to help develop ideas and get them to the place where you can share them with others."

"It came at the perfect time for me," said Dr. Mark Stevens, who teaches technology integration in the School of Teaching and Learning in the College of Education and Human Development.

Wednesday, Aug 23, 2017

THE BLADE

News • Sports • A&E • Business • Opinion

LOCAL

BGSU professor talks eclipse with Perrysburg students

By ZACK LEMON | BLADE STAFF WRITER
Published on Aug. 21, 2017 | Updated 9:30 p.m.



Kate Dellenbusch stood in the center of the Hull Prairie Intermediate gym, and invited 800 fifth and sixth grade students to cover her up with nothing but their thumbs.

They obliged, and learned first-hand how an object as small as the moon can block out something as large as the sun.

Ms. Dellenbusch is an astronomy professor at Bowling Green State University, and was invited to the school by Amy Boros, a 6th grade science teacher at HPI.

"The whole entire school day is centered around the eclipse," Mrs. Boros said.

Her science students will get their eclipse glasses ready for the big show later this afternoon, while social studies classes will learn about the ancient myths surrounding these rare events. English classes will add eclipse-related words to students' vocabulary, and math classes will learn about the scale of the planet, moon, and sun that lets an eclipse happen.

There has not been an eclipse visible to the entire United States since 1979, long before these students were born. They won't have to wait as long for the next one, though. These students will be juniors and seniors in high school for the next eclipse in 2023.

All the students will be watching the eclipse, which starts around 1:05 p.m.

Contact Zack Lemon at zlemon@theblade.com, 419-724-6282 or on Twitter @zack_lemon.

Appendix B: Falcon Best Recruitment & Recognition

Recruitment Email

FALCON BEST ROBOTICS

Registration for the FalconBEST 2017 Robotics Competition is open!

FalconBEST is a robotics competition and much, much more!

Watch the 2017 game teaser now at: <http://www.bestinc.org/>

Dates and registration instructions are below! You have until 5:00pm on Monday, April 24 to register for the 2017 competition.

Registration Instructions

**Please be sure your school can participate before you register.*

**We would like to have all 20 slots filled on game day.*

If registration is full, please put your school on the wait list.

1. Go to <https://www.eventbrite.com/e/2017-falcon-best-registration-registration-33148781899>
2. Follow the instructions to register.
3. If registration is full, please add your school to the wait list. If a team drops, we will go to the next team on the wait list.

Schedule of Events

- Kick-Off: September 16, 2017 @ BGSU Campus (Time: TBD)
- Practice Day: October 14, 2017 @ BGSU Campus (Time: TBD)
- Game Day: October 28, 2017 @ BGSU Stroh Center (Time: TBD)

BGSU | THE COLLEGE OF
TECHNOLOGY, ARCHITECTURE
AND APPLIED ENGINEERING
BOWLING GREEN STATE UNIVERSITY



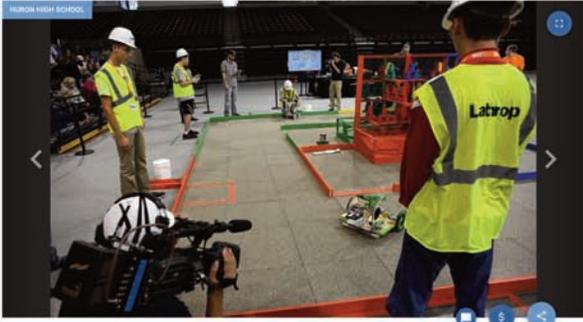
Appendix B: Falcon Best Recruitment & Recognition cont.

Falcon Best Recognition

Register
195 YEARS BOLD

Port Clinton, Huron win awards at robotics competition

10/28/2017 12:34 PM
HURON HIGH SCHOOL



2 / 7

Huron robotics team members participate in a round of Saturday's Falcon BEST Robotics Competition at BGSU. — Register photo/JILLY BURNS

Jilly Burns
Staff Photographer

FULL STORY

BOWLING GREEN — Port Clinton and Huron robotics teams operated like a well-oiled machines on Saturday. Robo-Skins competed alongside 17 other middle and high school teams, including Huron, at Bowling Green State University's Falcon BEST Robotics Competition, which stands for Boosting Engineering, Science and Technology.

Trending Articles
Trending Articles from Sanduskyregister

R



Members of the Port Clinton Robo-Skins watch the competition anxiously as others improve their machine during the Falcon BEST Robotics Competition at BGSU's Stroh Center in Bowling Green on Saturday, Oct. 28, 2017.

The competition's theme was Crossfire, where each team had to build robots to perform fire rescue and safety inspired tasks.

All morning, the teams rotated in groups of four for three-minute rounds to perform the tasks and score points. Between rounds, teams were able to quickly improve and repair their machines.

In addition to the robotics, each team created project and marketing presentations that were scored by a panel of judges.



Sophomore Chase Barton reacts to a malfunction in the Robo-Skins robot during a match on Saturday, Oct. 28, 2017 at BGSU's Falcon BEST competition.

It started to look grim for the Robo-Skins at the beginning, team advisor Bobby Good said. "We started the matches with one of our two (robot) claws not functioning," Good said.

But with weeks of dismantling and rebuilding, the team was well equipped to quickly repair the robot.



Junior Alexa Bradshaw cheers on Port Clinton's Robo-Skins at the Falcon BEST Robotics Competition at BGSU on Saturday, Oct. 28, 2017.

Here are the final results of area schools:

Port Clinton

- Fourth place overall
- Best team video

Huron

- Ninth place overall
- Best web page design



Video provided by Port Clinton Schools.

[Read about Robo-Skins competition preparation.](#)

[Read about the team's past appearance at the competition.](#)

Mentoring the 'New Bot on the Block'

For Huron, it was their first appearance at the annual competition and Good, being a 2005 graduate of the school district, gave the new team a helping hand.

"My students and I meet with the (Port Clinton) team in person and we also texted and emailed almost daily with questions," team advisor Patty Ryan said. "This was a huge undertaking and we would not have gotten this far without them."



Huron juniors Matthew Wilson and Wyatt Kromer prepare for a match during Saturday's robotics competition at BGSU's Stroh Center in Bowling Green.

At the beginning of the school year, Huron offered a STEAM, science, technology, engineering, art and math, class for the first time. More than 30 students joined the class and signed up for team committees in preparation for the competition.

"These groups collaborated every day working toward a common goal," Ryan said. "It was like working for a small company with different departments. It was very much a real world experience."

Appendix B: Falcon Best Recruitment & Recognition cont.

Falcon Best Recognition

"These groups collaborated every day working toward a common goal," Ryan said. "It was like working for a small company with different departments. It was very much a real world experience."



Huron robotics team members participate in a round of Saturday's Falcon BEST Robotics Competition at BGSU.

One of the groups worked on an engineering journal detailing the six-week design journey. The team was selected to compete in the wild card round based on having an outstanding journal, Ryan said.

At the end of the day, both teams were proud of their performance.

"For first timers, I am beyond proud of the work my students put into this BEST Competition," Ryan said. "It has been a six-week journey that ended in success on every level."

BGSU robotics competition



1 / 38

Teams representing 17 schools from Indiana and Ohio compete in the Falcon BEST Robotics Competition at BGSU's Stroh Center on Saturday. - Register photo/JILLY BURNS

ORIGINAL UPDATE

Competition kicked off with a bang as seventeen teams, including Port Clinton and Huron high schools, battled in rapid fire rounds Saturday morning for the Falcon BEST Robotics Competition at Bowling Green State University's Stroh Center.

The teams were challenged to complete tasks related to fire rescue and safety with their robots, in addition to project and marketing presentations, to gain points.

[Read more about the Robo-Skins preparing for competition.](#)

"We are scoring mass points and staying at the top of the leader board," Port Clinton team leader and technology education teacher Bobby Good said.

Port Clinton's Robo-Skins was ranked second, with 1800 points, going into the semi-finals. The team trailed Millstream Career Center by 400 points while Anthony Wayne High School trailed Port Clinton by 200 points, according to Good.

Huron was in tenth place, with a score of 1163 points.

Reach photographer Jilly Burns at jillyburns@sanduskyregister.com and follow her on Twitter @jillyburnsphoto.

Appendix B: Falcon Best Recruitment & Recognition cont.

Falcon Best Recognition

BOWLING GREEN STATE UNIVERSITY

BGSU NEWS

ACADEMICS ADMISSIONS ABOUT ATHLETICS ALUMNI LIBRARIES RESEARCH STUDENTS INTERNATIONAL

MAUMEE VALLEY COUNTRY DAY WINS FALCON BEST ROBOTICS 2017 COMPETITION

Bowling Green State University / News / 2017 / Maumee Valley Country Day wins Falcon BEST Robotics 2017 competition



Twitter Like 0 Share

Eighteen high school teams competed in the **Falcon BEST Robotics 2017** event, held Oct. 28 at the Stroh Center, but none better than Maumee Valley Country Day School from Toledo.

The MVHawksRobotics won the BEST award, which recognize the overall top team after counting total points from the engineering notebook, robotics competition, marketing, exhibit and spirit events. That wasn't the only accolade collected by Maumee Valley as it also took home awards for second place in the robotics competition, the Most Robust Machine, BEST Engineering Notebook and BEST Exhibit and Interview.

Maumee Valley, along with Millstream Career Center, Cardinal Stritch Catholic High School, Anthony Wayne High School, Port Clinton High School, Hamilton Southeastern High School and St. Ursula Academy, qualified for regional competition Nov. 29 to Dec. 1 in Fargo, North Dakota.

This was the fifth consecutive year that Bowling Green State University has hosted the event. BEST stands for Boosting Engineering, Science and Technology. The theme for this year's event was fire safety. Teams interviewed and engaged with local fire departments to help develop their robot's strategy.

"This year presented some large challenges even before the Falcon BEST contest was unveiled," said Phil Paskvan, MVHawksRobotics head coach. "Maumee Valley tries very hard to make sure that kids are exposed to many experiences while they are here. Athletics, clubs, drama productions and challenging academics all compete with time for the robotics team. As coach, I resolved this by making myself as available as possible by being at the school after sports and club activities. This usually meant some long nights or Saturdays, but it ensured access to tools and facilities."

It also ensured the team would be traveling to North Dakota.

"The size of the team is also a challenge," Paskvan said. "We had approximately 40 students from seventh to 12th grade participate in all areas of BEST. Having student leaders organize these groups was a huge factor in making sure we finished all our tasks."

"The two biggest influences on success for the team this year were having three great senior student leaders, Oliver Heard, Bailey Hannan and Finn Bamber, who provided organization and guidance while using the tools and a physical space provided by the school to work. It can be messy."

The teams were required to design and build a prototype robot to rescue a fire test mannequin, contain simulated dangerous chemicals and extinguish "flames" with plastic golf balls during a three-minute match. A robot can score points by performing each objective – the faster the accomplishment, the higher the score.

"The team also branched into new areas for this year," Paskvan said. "We added a programming group to create a Simulink program that is scored as part of our engineering documentation and we purchased a CnC router for accurately cutting robot components."

The goal of BEST Inc. is to help students decide on career choices early, especially ones related to STEM [science, technology, engineering and math].

To see the results of the competition, visit the [Falcon BEST Robotics website](#).

Appendix B: Falcon Best Recruitment & Recognition cont.

Falcon Best Recognition

BOWLING GREEN STATE UNIVERSITY

BGSU NEWS

ACADEMICS ADMISSIONS ABOUT ATHLETICS GIVE MYBGSU EMAIL

FALCON BEST ROBOTICS COMPETITION GETS HIGH SCHOOL STUDENTS FIRED UP

Bowling Green State University / News / 2017 / October / Falcon BEST Robotics competition gets high school students fired up

BGSU to host event Oct. 28 at the Stroh Center



Twitter Like 14 Share

By Bob Cunningham

It used to be if you asked a group of children what they want to be when they grow up, one of them will say firefighter. Ask kids today the same question and they might say a robotics engineer who builds firefighting robots.

At least that's the hope of the **Falcon BEST Robotics 2017 competition** from 9:30 a.m. to 3 p.m. Oct. 28 at the Stroh Center. It is the fifth consecutive year that Bowling Green State University has hosted the event. BEST stands for Boosting Engineering, Science and Technology.

There are 18 high school teams competing in this year's competition, which has a fire safety theme. In addition to the students competing for a chance to advance to the regional in Fargo, North Dakota, there are a multitude of awards up for grabs.

Each year, the BEST Robotics competition grows more exciting and the Stroh Center can expect to have a fun and festive vibe. The event is hosted by BGSU, the **College of Technology, Architecture, and Applied Engineering (CTAAE)** and Northwest Ohio Center for Excellence in STEM Education (NWO).

"Imagine 18 schools, parents and supporters coming to watch, so there will be more than 500 people there cheering and supporting their teams," said Dr. Mohammad Mayyas, BGSU's Falcon BEST hub director and an associate professor of engineering technologies. "They bring their pep bands and play music, so the atmosphere is more like a football or basketball game. Also, hosting the event in the Stroh Center promotes a sports environment."

The teams are required to design and build a prototype robot to rescue a fire test mannequin, contain dangerous chemicals and extinguish flames during a three-minute match. A robot can score points by performing each objective – the faster the accomplishment, the higher the score.

The goal of BEST Inc. is to help students decide on career choices early, especially ones related to STEM [science, technology, engineering and math].

"Robotics design is an excellent tool to boost the STEM field," Mayyas said. "Because we are able to host this competition, it helps with our recruitment to our **mechatronics and robotics program.**"

Sponsors of the event include BGSU, CTAAE, the College of Business, NWO, Lathrop and First Solar.

Appendix C: NWO STEM E-Newsletters Sample

Advancing science, technology, engineering, and mathematics education for people of all ages.



Vol. 9 Issue #10 October 2017

In This Issue

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- World of Seven Billion Video Contest**
- UNITE**
- NWO STEM Activity**
- Ice Cube Curling: Let's Explore Friction**

K-16 STEM in the NEWS

STEM in the Park Once Again Amazes the Crowd!

"STEM in the Park" is a free, hands-on and inquiry-based event designed to engage participants in the STEM (science, technology, engineering, and mathematics) fields, was held on the campus of BGSU on September 23. An estimated crowd of around 5,000 people attended the 8th annual event and enjoyed over 175 activities from a wide variety of exhibitors showcasing STEM disciplines. Two new activity zones designed the crowd with their unique activities. Children and adults alike got their "wheels turning" in the "All Wheels Zone" that featured activities with trees, gears, and all types of wheels. The Right Direction, a local youth development organization, was also featured in the zone and offered dazzling BMX motocross demonstrations. The Robotics Zone was also new this year, and it featured activities that explored the design, construction, operation, and application of robots.



"We were thrilled to have The Right Direction at "STEM in the Park" this year, especially because of its strong positive message for youth. Its STEM application in physical science concepts and the high-energy demonstrations," said Anne Pollock, STEM in the Park coordinator.

One of the main strengths of this program is the spirit of community that evolves during its planning and implementation. The many volunteers and exhibitors that provide free STEM-related and inquiry-based learning activities to engage children and their families contribute to the remarkable success of "STEM in the Park". As well, many exhibitors state that participation in "STEM in the Park" is a worthwhile experience and is beneficial for their organization. One such organization is SSOE, a local engineering firm that helps sponsor the event while also administering an activity station. This year they helped participants build and construct their own motors, serving as a playful introduction to Newton's Laws of motion.



"This event has become our passion. We truly love to see children and their families enjoying hands-on STEM learning activities," stated Emilio Duran, who co-founded the event with his wife Lena Duran. Both are faculty in BGSU's College of Education's School of Teaching and Learning and are amazed at the growth of the event over the years.

Another important aspect of the event is a grant program that was developed to offer transportation to students when transportation is the main barrier of attendance. Mrs. Pollock estimated, "Each year we reach out even further in our region to provide this opportunity and we're thrilled and grateful at the number of those who come to enjoy this spectacular event!"

Attendance for the event has steadily grown each year, as crowds come to not only participate in hands-on STEM activities, but also to watch the live super-sized demonstrations from the Toledo Zoo and Imagination Station on the STEM Stage, listen to a steel drum band and vocal groups on the Music Stage, and enjoy free Tony Pacheco's lunch. This year, over 5,000 hot dogs were served, and countless smiles seen everywhere.



Presenting sponsors for the 2017 "STEM in the Park" included BGSL, BP, First Solar, Lubrizol, PPG Industries, and Verizon. Community sponsors include The Andersons, Thayer Family Dealerships, Perryburg Rotary Club, SSOE, Northwest Ohio Center for Excellence in STEM Education at BGSU, and Toyota. General Sponsors were Wal-Mart, Tony Pacheco's, BoostItAll, Children's Discovery Center, Columbus Gas of Ohio, Partners in Education, Glass City Federal Credit Union and Whirlpool.

For more photos, videos and information on "STEM in the Park," please visit: www.stemforbook.org.

Community STEM in the NEWS

NSTA: Partnering with Scientists

By Debra Sheers
Reprinted with permission from NSTA

While it's common for many teachers to have a scientist visit their classroom once or twice a year, some teachers have formed long-term partnerships that enable scientists to spend significant time with their students. Cindy Hopkins, science teacher at Kaffee Middle School in Corpus Christi, Texas, met one of her scientist partners—Janet Ortiz, a graduate student from Texas A&M University-Kingville (TAMUK)—at a professional development session on quality that Ortiz led at TAMUK. "There is no extra money for field trips, so I actively seek science professionals to come to my class and connect students with real-world science," Hopkins explains.

"This past spring, I had Janet come to my class [twice a week for two months] and teach a unit about qual [her area of expertise]... Researchers and scientists are another voice for my students, and they pay more attention [to them]," Hopkins contends.

"Janet brought good binoculars, and my students used them...to [examine] bird bands. She asked students to give her evidence, and taught them how to do it. When [journalists did] this, students make connections from the classroom to the field," Hopkins maintains.

A Vanderbilt University Scientist in the Classroom Partnership fellow helps middle school students in the Nashville, Tennessee, area test their car design for speed.

"I did activities alongside the students. They got to see me as a learner. I asked questions to help students connect her material with what I've taught them," she relates. Having Ortiz teach the unit also "allowed me to sit down with students that need one-on-one attention and connect with them," she notes.

David Lockett, middle-level science, technology, engineering, and math (STEM) teacher at Edward W. Bok Academy in Lake Wales, Florida, benefited when Principal Damien Moses helped bring Keith Young, CEO of Detroit-based Ecotek—a research organization promoting science education and careers for students ages 10 to 17 (www.ecotek-usa.com)—to the city's charter school system for two semesters. Young co-ought "and delivered" lessons on olive growing and alternative battery and fuel options with our STEM classes," says Lockett. "We had a community need because a plant and tree disease was affecting citrus crops."

Young even took some middle school and high school students to the U.S. Department of Agriculture National Lab for Genetic Research Preservation in Fort Collins, Colorado. "Students made bacterioides and did directional drone studies of infected trees. [The trip] showed students how something in Florida could also affect the rest of the country and the world," Lockett reports.

"In grad school, one of my friends was working on his thesis and was required to do outreach as part of his own graduate work. That school year, Dr. J. P. Trassil (J.P.) came to my classroom to share his research with the students," recalls Nichole Mantas, a biology teacher in New York. "Then he and I designed a hands-on activity to simulate his research. He had been working similarly to a zipper in the blood-brain barrier." Mantas notes.

"In recent years, J.P. has moved on from his graduate work, and our lessons have changed as well...For two years, J.P. came [to my classroom] and shared how his research works," she relates. "It helped engage a group of students who might have just considered science a hobby."

[Click here to read the full article.](#) [Back to top](#)

STEM Opportunities

NWO SYMPOSIUM - Online Registration now OPEN!

NWO Symposium on Science, Technology, Engineering and Mathematics Teaching
November 18, 2017
8:45 AM - 3 PM
Chester Hall @ BGSU

Featuring the 2017 keynote speaker: Dr. Gabriel Manley



2017 NWO SYMPOSIUM STRANDS

1. STEM in the Community: Thinking Outside the Classroom
2. Putting Creativity to Work: Teaching STEM With Innovation
3. Integrating Technology in the Classroom
4. Teaching and Learning in SCIENCE
5. Teaching and Learning in MATHEMATICS
6. Teaching and Learning in ENGINEERING

[CLICK HERE to register online!](#)

Program now available online at: bgsu.edu/nwo/symposium

aeop **cybermission**

eCybermission student registration is open

eCybermission is a free competition for 6th to 9th grade students. Early registration ends November 9. Final registration ends December 13.

[Click here](#) for more information and to register!

Junior Solar Sprint (JSS) Registration is Open

JSS is a free solar competition for middle school students. Registered teams will receive a free solar car kit. For more information and to register: <http://www.usaeo.com/competitions/jss/>

The National Academy of Engineering EngineerGirl Writing Contest

All Students - girls and boys in grades 3-12 can enter a chance to win up to \$500.

To enter, students imagine how engineering can help their community. Students will then write a piece to their city/country council making the case for an infrastructure improvement.

Full rules and requirements can be found on the EngineerGirl Website: <http://theengineergirl.org/2017contest.aspx>

Google For Educators Blog

This blog has many helpful videos and resources for digital citizenship and safety such as: "Teach Online Safety with "Be Internet Awesome".

As classroom technology usage increases, it's important for students to be prepared to make smart decisions online. Developed in collaboration with online safety experts, "Be Internet Awesome" teaches the fundamentals of digital citizenship and safety so students can explore the online world with confidence. In addition to a robust curriculum for teachers, the program includes Interland, an adventure-packed online game that puts these critical lessons into hands-on practice.

Access resources at: <https://goo.gl/8t9v4n>

Google Education website can be found at: <https://goo.gl/8t9v4n>

INFOhio District Building ICoach

October 9 kicked off the DistrictBuilding ICoach application period, and INFOhio is looking for tech-dedicated education to join more than 300 D/B ICoaches volunteering as a statewide team of INFOhio experts in their district or building. The required training is an online, self-paced course worth 15 contact hours.

INFOhio's D/B ICoaches provide hands-on training to help teachers make the most of classroom technology and INFOhio digital resources. D/B ICoaches do more than just talk about technology features; they connect technology to real-life classroom teaching.

Consider becoming a part of this statewide network. Contact: central@infOhio.org for application information.

World of Seven Billion Video Contest

Back by popular demand, the World of 7 Billion student video contest helps teachers bring technology and creativity into middle and high school classes. The contest challenges students to create a short video connecting world population growth and one of three global challenges: Advancing Women and Girls, Feeding 10 Billion, or Preventing Pollution. Students can win up to \$1,000 and participating teachers will receive free curriculum resources.

The contest deadline is February 22, 2018 - use this lesson plan to get started now! Full contest guidelines, resources for research, past winners, and more can be found at <https://www.worldof7billion.org/student-video-contest/>.

UNITE

UNITE is a pre-collegiate summer program for talented high school students from groups historically underserved and underrepresented in science, technology, engineering and mathematics (STEM).

An initiative of the Army Educational Outreach Program (AEOP), Unite is administered by the Technology Student Association (TSA). The program, held at host university sites, is designed to encourage and help prepare students to pursue college-level studies and, ultimately, careers in engineering and related STEM fields.

For more information: <http://www.usaeo.com/programs/stem-enrichment-activities/unite/>

[Back to top](#)

NWO STEM Activity

This month's Hands-on Activity is from the Bowling Green Curling Club and was an activity station at STEM in the Park.

More fun activities from STEM in the Park can be found on our website at: <http://www.bgsu.edu/nwo/symposium/whats-the-STEMinthePark.html>

Ice Cube Curling: Let's Explore Friction



What You Need

- 2 players
- Ice Cubes (kept frozen until right before they are needed)
- A coin
- Kitchen counter top or 1 metal tray (cookie sheet)
- Small Hand Towel

What To Do

1. Start with a dry kitchen counter top or metal tray
2. Place a coin on the counter top or tray to act as your "house" (the target in curling)
3. Try to slide your ice cube as close as possible to the house.
4. Each player tries to get their ice cube closer to the house than the other player.
5. Predict what will happen as the ice cube is moved around on the tray with greater motion.
6. Gently move the ice cube, rubbing it on the flat surface, increasing speed while still maintaining good self-control.
7. Slide your ice cube around and play again.
8. Compare how the ice cubes move as the surface gets wetter.
9. Experiment with different ideas...what happens if you put a sheet of wax paper on the tray or counter top?

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

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 info@bgsu.edu. We are always looking for great STEM education stories to feature in upcoming newsletters.

Join NWO on Facebook

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eNewsletters from the past!

Looking for past articles from our eNewsletters?

[Click here](#) view and download from our eNewsletter archives.

Appendix D: NWO STEM Inquiry Series Advertising Samples



Black Swamp Math Teachers' Circle (BS - MTC)

We are very happy to be bringing Math Teachers' Circles to Northwest Ohio!

Math Teachers' Circles started in 2006 and have since spread across the United States. Math Teachers' Circles bring together teachers and mathematicians to enrich the teachers' experience of mathematical problem solving. There are four goals:

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

We would love to have you be part of this great adventure in mathematics. The 2017-18 sessions are FREE and open to K - 12 math teachers and college faculty/staff in northwest Ohio.

Participants will receive:

1. Great professional development.
2. Networking with mathematicians, higher education faculty and other classroom teachers.
3. Contact hour certificate.

Please SAVE THE DATE for the following BS-MTC meetings!

All meetings are from 6:30 - 8:30 PM at BGSU. You can attend as many meetings as you want, depending on your schedule!

Registration will open in August 2017.

- Monday, September 11, 2017
- Monday, October 16, 2017
- Monday, November 13, 2017
- Monday, February 12, 2018
- Monday, March 12, 2018
- Monday, April 16, 2018

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



Black Swamp Math Teachers' Circle is a partner of NWO

Appendix E: NWO Symposium Advertising & Recognition

Recruitment Email - Attendee

2017 NWO Annual Symposium on Science, Technology, Engineering, and Mathematics Teaching



Online registration is now open!
[Click here](#) to register

2017 Symposium Program is available for viewing!
[Click here](#) to see the sessions!

November 18, 2017
8:45 a.m. to 3:00 p.m.

**Oiscamp Hall @
Bowling Green State University**

Registration Fee Includes:

- 6 hours of high quality professional development
- Conference bag/materials
- Keynote address by Dr. Gabriel Matney, BGSU, Associate Professor, College of Education & Human Development
- Lunch

Contact Hour Certificate Available



Featuring a keynote presentation by Dr. Gabriel Matney!

Gabriel Matney taught middle and high school mathematics for five years. He began his teaching career in the rural schools and then was given an opportunity to create a mathematics program at an inner-city school for the state's largest district. During this time he creatively energized the mathematics curriculum of the school with connections among STEM topics. These efforts led to engaged and successful

learning by his students and earned him the District's Teacher of the Year award. After his teaching career Gabriel earned his Masters of Science in Mathematics and his Ph.D. in Mathematics Education. He is currently an Associate Professor of Mathematics Education for Bowling Green State University in the College of Education and Human Development and serves as Vice-President for the Ohio Council of Teachers of Mathematics and Vice-President of Publications for the Research Council on Mathematics Learning.

In his sixth year at BGSU, Dr. Matney has actively worked on 16 successfully funded grants that are designed to help in-service teachers create dynamic and minds-on classrooms that improve the learning of their students. His research centers on improving professional development for teachers and the development of preservice teachers as professionals. In addition to his grant work with teachers in northwest Ohio he has given more than 74 workshops across the United States, Thailand, South Korea, and Japan. He has 24 peer-reviewed research publications and 47 peer-reviewed research presentations. Additionally he has received scholarly grants to be a visiting Mathematics Education Professor for Khon Kaen University in Thailand and a Keynote speaker for the APEC-Tsukuba Conference in Japan.

For more information or to register visit:
bgsu.edu/nwosymposium

Sponsored in part by:



Appendix E: NWO Symposium Advertising & Recognition cont.

Recruitment Email - Presenter

Deadline: July 25, 2017



Northwest Ohio Symposium on
Science, Technology, Engineering,
and Mathematics Teaching

The Northwest Ohio Center for Excellence in STEM Education

brings you the 2017 NWO Symposium on Science,
Technology, Engineering, and Mathematics Teaching

Saturday, November 18, 2017
8:30 AM - 4:00 PM
Olscamp Hall, Bowling Green State University
Bowling Green, OH 43403

Featuring the 2017 keynote speaker:
Dr. Gabriel Matney, BGSU

Dr. Matney is a Mathematics Education faculty member who works with K-12 teachers all over Ohio and has math education connections with universities in Thailand, China, Australia, New Zealand, and Fiji.

Presentation Proposal Information

We invite submission of proposals for presentations at the 2017 NWO Symposium on Saturday, November 18th at Bowling Green State University. To submit a presentation proposal, please click the link below and complete the online form. *Please review the Symposium Strands listed below; you will need to choose one of these strands for your presentation.*

[Click Here To Apply by July 25](#)

All presentation proposals must be submitted by July 25th at 5:00PM. Beginning July 26, NWO staff will review the proposals and notify prospective presenters if their proposal has been accepted.

We have made some changes for this year's symposium:

- Eliminated the double session option. All sessions will be 50 minutes.
- Free registration for the lead presenter and 1 co-presenter. Additional co-presenters will need to register as attendees and pay the \$40 registration fee. We can still list them as presenters in the program.
- Narrowed the list of strands to more focused areas.
- Limited each lead presenter to ONE session. You can still be a co-presenter for another session but can only lead one.

For more information visit the Symposium website at:
bgsu.edu/nwoSymposium

Questions? Contact nwo@bgsu.edu.

2017 NWO Symposium Strands

- 1. STEM in the Community: Thinking Outside the Classroom**
Making STEM relevant for students serves an instrumental purpose in improving motivation and learning. Showing students the applications of STEM outside the classroom is a great way to get them engaged. There are dozens of valuable community resources in northwest Ohio that can supplement and support your STEM teaching efforts. Sessions in this strand will demonstrate some of the community resources that are available, and how they can be integrated into the classroom.
- 2. Putting Creativity to Work: Teaching STEM With Innovation**
Creativity and innovation might aptly be described as the drivers of educational growth and success. New and innovative approaches to STEM teaching and learning result in deeper and more meaningful STEM learning for students. *Sessions in this strand will explore some innovative ways to teach STEM.*
- 3. Integrating Technology in the Classroom**
Sessions in this strand will focus on how to use technology in STEM teaching focusing more on the technology being used than a specific content area.
- 4. Teaching and Learning in SCIENCE**
Sessions in this strand will focus on deepening science content and/or exploring interesting and effective ways to teach science.
- 5. Teaching and Learning in MATHEMATICS**
Sessions in this strand will focus on deepening mathematics content and/or exploring interesting and effective ways to teach mathematics.
- 6. Teaching and Learning in ENGINEERING**
Sessions in this strand will focus on deepening engineering content and/or exploring interesting and effective ways to teach engineering.

NWO Symposium Recognition



HOME CAMPUS

Conjecturing adds up to better learning, BGSU prof Gabriel Matney tells STEM teachers

TOPICS: Gabriel Matney Northwest Ohio Center For Excellence Symposium On STEM Teaching



From left, Kevin Gibbons, Joshua Jucutan, and Skylar Urban, all from Cleveland State work on a problem posed by Gabriel Matney.

POSTED BY: DAVID DUPONT DECEMBER 2, 2017
By DAVID DUPONT
BG Independent News

One may have assumed a talk entitled "The Power and Promise of Developing a Conjecturing Modality" would be a bit on the dry side.

The speaker, Gabriel Matney, an associate professor of math education at Bowling Green State University, would advise that rather than assume one should make a conjecture that the talk could instead be engaging and enlightening for the 300 or so teachers and students of mathematics in attendance at his keynote address for the Northwest Ohio Center for Excellence Symposium on STEM Teaching two weeks ago.



Gabriel Matney

"Rather than assuming that we know and acting on it," he said. It's better to engage in "conjecturing and testing those conjectures and see if they hold or not."

Could this talk be inspiring? Yes.

Matney explained how he made a conjecture as a teenager in love. He was dating this girl, and he conjectured that even though he could barely afford a car for himself, he could one day get her the car of her dreams.

So he asked her to describe her dream car. She detailed a purple, tricked-out Dodge Stealth. So 19 years later that girlfriend, now his wife, got that car. It did take a few years extra because it had to be specially painted purple. When delivered it was "an epic Valentine gift" born of early planning.

Conjecturing, Matney said, as powerful teaching and life tool. Matney rooted his talk in his own life. He had the audience tackle problems that he had originally posed to his three daughters, now teenagers, when they grew up.

He conjectured, he said, that "if I spoke academic language instead of common parlance, they'd be able to handle academic language." So as a preschooler, his eldest child would spot a box and know it was a "rectangular prism," even if she couldn't quite get her tongue around all the syllables.

A trip to the bank with his second daughter resulted in a lesson in negative numbers. She persistently questioned him about why they were there. Matney explained to her that if they wanted to make "expenditures" they needed to deposit money so they didn't go into negative numbers.

And he posed a challenge to the audience, to recreate a shape that was flashed onto the screen with blocks piled in the middle of their tables. He noted that when he did this with his three daughters, it was the youngest, still a preschooler, who always got it right. She would put it together and ask: "Is this it?"

She did not assume she had the answer, rather she posited what she came up with as a possible solution.

Matney recalled working for his step-father's lawn care business. Getting from customer to customer was a challenge, given distances and traffic. This was in the days before GPS, so Matney sat with a map and carefully planned out the route taking into consideration traffic patterns. "Taking time to think about it saved us days of life."

When he became a teacher, conjecture took a central role in his lesson plans.

Matney got a job in an inner city school in Oklahoma City. Half the violent crimes in the state took place in the school's neighborhood, which was plagued with gangs. The students came into ninth grade with a fourth grade mastery of math. Only 26 percent of ninth graders ended up graduating. And 98 percent of the students were on free and reduced lunch.

Many people would assume they would not be able to excel in academics.

Matney conjectured they could learn, and excel.

"I'm going to believe in you," he told students. "I'm never going to let you not believe in yourselves." Even when students said they didn't care, he would respond: "I do care. I'll never let you fail."

Matney coached the robotics team. They built a robot that cleaned toilets, and they built prosthetic limbs, and in doing so won top honors on the national level.

His students also developed plans for a training center to help adults such as their parents get the skills they needed for better jobs. And they explore the value of geodesic domes, which can withstand tornadoes better than more traditional designs.

So, Matney said, you come make assumptions based on the negative information or you could look at the students' stellar accomplishments. "Conjecture broadens knowledge more than assumptions."

Testing authentic conjectures improves their brains "better than any static knowledge they learn could."

These activities help them develop "a sustainable conjecture modality within their very being," he said. "I believe that this will allow my students to have a life of perpetual and thoughtful wonder. I want to encourage perpetual wonder. Life is too short to ever lose that."

He urged the educators to make conjectures about all the wonderful things their students could accomplish, and then see what they create and the problems they overcome.

Appendix F: OJSHS Advertising & Recognition

Recruitment Email Sample



The banner features the Ohio Junior Science and Humanities Symposium (OJSHS) logo on the left, which includes the text "OHIO JUNIOR SCIENCE AND HUMANITIES SYMPOSIUM" and "imagine.design.create". On the right, there is a NASSP logo with the text "APPROVED FOR LISTING NASSP 2017-2018 STUDENT CONTESTS & ACTIVITIES". The background of the banner shows a satellite in space and a globe.

Registration is now OPEN!

Join us for the 55th Ohio Junior Science and Humanities Symposium.

March 14-16, 2018
at Bowling Green State University

Important Dates for the 2018 Regional JSHS!

Registration is open until **Sunday, February 18, 2018 @ 5:00pm**. Please use the link below to register. The registration link is for all participation levels:

- Student Presenters
- Student Delegates
- Parents
- Teachers
- Guests

No registrations for any of the above groups can be accepted after **February 18, 2018 @ 5:00pm**.

Click here to register: <http://www.cvent.com/d/05qykx>

- Notification to students to confirm participation in oral presentations will take place **March 1, 2018**
- All students, teachers, guests, parents, and STEM professionals/volunteers must complete registration to attend the Regional JSHS by **February 18, 2018 @ 5:00pm**.

More information on the 2018 Ohio JSHS can be found at <https://www.bgsu.edu/nwo/programs/ohio-junior-science-and-humanities-symposium.html>

Questions should be directed to NWO (nwo@bgsu.edu).



The footer contains three logos: the NASSP logo (National Association of Secondary School Principals), the NWO logo (National World Organization), and the BGSU logo (Bowling Green State University).

The National Association of Secondary School Principals has placed this program on the NASSP National Advisory List of Student Contests and Activities for 2017-2018

Appendix F: OJSHS Advertising & Recognition cont.

OJSHS Recognition



Region Spotlight: Ohio JSHS

The Ohio JSHS was recently profiled in the [Bowling Green University \(BSU\) news](#) for their programs for teachers and students.

In partnership with the Northwest Ohio Center for Excellence in STEM Education at BSU, Ohio JSHS received an AEOP Strategic Outreach Partnership grant in 2016. This grant expands the reach of JSHS by recruiting and training students from underserved populations and teachers from Toledo Public school district to engage in original scientific research and STEM studies.

"It's a very big commitment," Springfield biology teacher Marty Perlaky said. "But the opportunity we can provide to our students is bigger than the commitment. It makes me a better teacher, but the real driving force behind why we get involved and why the BGSU professors write the grants is to make sure underprivileged and underserved kids get chances."

The grant was renewed in 2017 to allow OJSHS and NWO to continue their efforts and expand the project to reach additional school districts. By breaking down the process and celebrating the joy of discovery, they hope to engage 200 students in the program.

[Read More Here](#)

AEOP continues to award Strategic Outreach Partnership grants throughout the year. This past summer, the Intermountain and North Carolina JSHS regions also received funding. We encourage you to consider proposing a project or activity in the future and will notify you when the next round of funding requests will begin.

BGSU NEWS

FINDING A PATH TO SCIENTIFIC DISCOVERY

By Amy G. ...

BGSU works with area schools to promote student research.

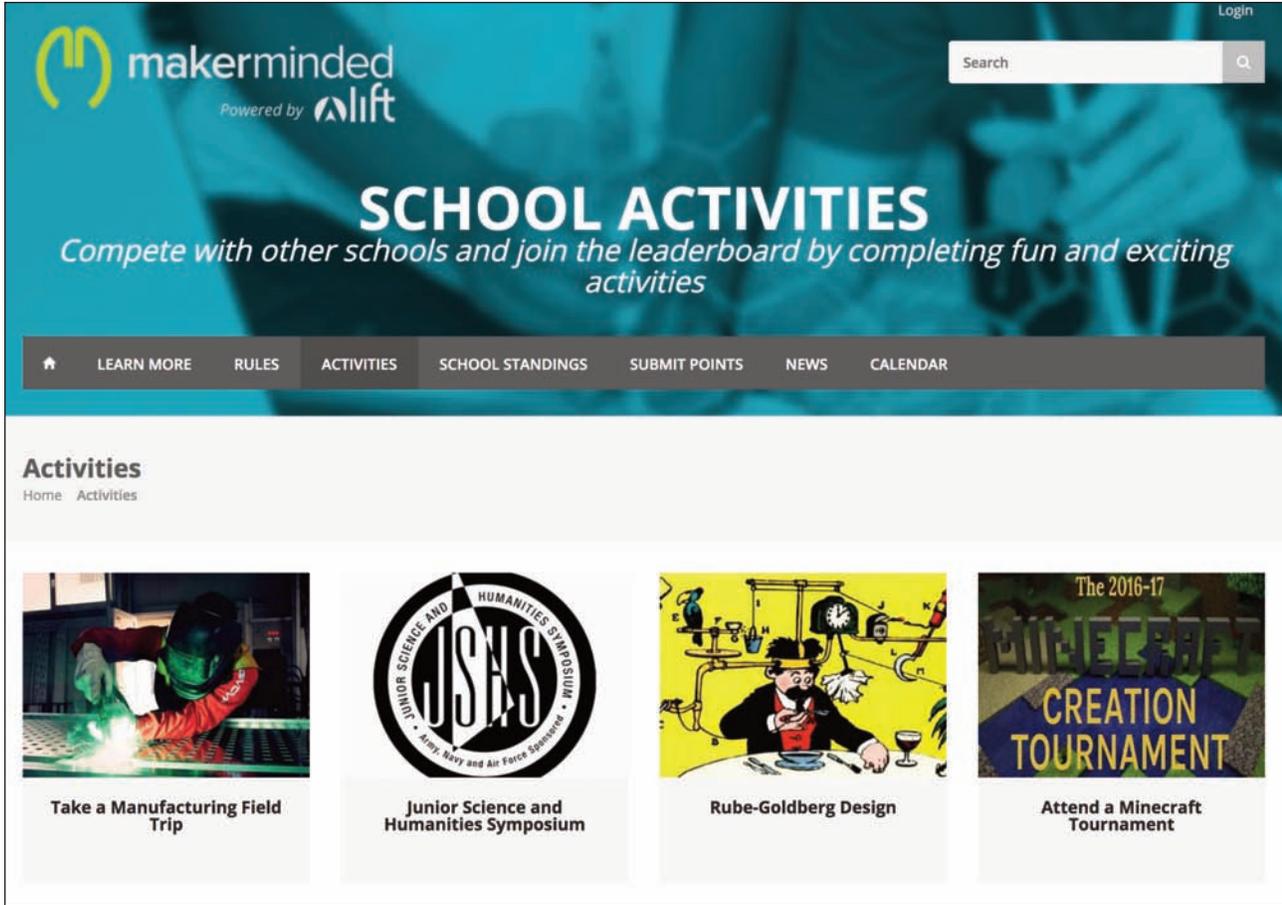


Junior Science & Humanities Symposium
24 Warren Street Concord, NH 03301 | 603-228-4530
jshs.org



Appendix F: OJSHS Advertising & Recognition cont.

OJSHS Recognition



The screenshot displays the 'SCHOOL ACTIVITIES' page on the maker-minded website. The header features the maker-minded logo (Powered by lift) and a search bar. The main heading is 'SCHOOL ACTIVITIES' with the subtext 'Compete with other schools and join the leaderboard by completing fun and exciting activities'. A navigation menu includes: Home, LEARN MORE, RULES, ACTIVITIES, SCHOOL STANDINGS, SUBMIT POINTS, NEWS, and CALENDAR. The 'Activities' section lists four items:

- Take a Manufacturing Field Trip**: Accompanied by an image of a person in a red shirt and green helmet working on a CNC machine.
- Junior Science and Humanities Symposium**: Accompanied by the OJSHS logo, which includes the text 'JUNIOR SCIENCE AND HUMANITIES SYMPOSIUM' and 'Army, Navy and Air Force Sponsored'.
- Rube-Goldberg Design**: Accompanied by a cartoon illustration of a man in a suit sitting at a table with a complex contraption of gears and pipes above him.
- Attend a Minecraft Tournament**: Accompanied by a Minecraft-style graphic with the text 'The 2016-17 MINECRAFT CREATION TOURNAMENT'.

Appendix G: Army Education Outreach Program (AEOP): Support for Ohio Junior Science & Humanities Symposium Recognition

AEOP Recognition

BOWLING GREEN STATE UNIVERSITY

BGSU NEWS

ACADEMICS ADMISSIONS ABOUT ATHLETICS ALUMNI LIBRARIES RESEARCH STUDENTS

FINDING A PATH TO SCIENTIFIC DISCOVERY

Bowling Green State University / News / Finding a path to scientific discovery

BGSU works with area schools to promote student research



Springfield teachers McKenna Reitz and Marty Perlaký (left and right) and NSTC teacher Natalie Cook (center) conduct fieldwork for their Global Learning Observations to Benefit the Environment certification.

By Bonnie Blankinship

It's an unlikely setting in which to find a group of high school science teachers: gathered around tables in a concrete-floored, industrial style building, where a miniature Vietnamese pig snorts happily in her pen nearby, baby chicks and two pregnant Flemish giant rabbits share another pen and various types of mushrooms flourish in containers.

And that's just one small area of the rambling Frank Dick Natural Science and Technology Center (NSTC), a Toledo Public Schools vocational school adjacent to the Toledo Botanical Garden, located at 5561 Elmer Drive.

But the unusual space is a wonderland for students to learn about the natural world, and a perfect setting for teachers to learn about how to guide and inspire the students to conduct original research. The teachers, from NSTC and Springfield High School, are part of a project led by Bowling Green State University whose aim is to increase the number of underrepresented students participating in the Ohio Junior Science and Humanities Symposium (OJSHS) in March and engage students in scientific research and STEM studies, showing them they could have successful careers as STEM professionals.

The teachers and BGSU directors Dr. Emilio Duran, a professor in the BGSU School of Teaching and Learning, and Susan Stearns, assistant director for programming and development of the Northwest Ohio Center for Excellence in STEM Education (NWO), have been meeting regularly since the beginning of September, putting in long hours after the school day to make the project a success.

"It's really important, and one of the four elements of the program, to have the bulk of the teachers in the same building so they can plan and work together," Duran said of the frequent group meetings.

"It's a very big commitment," Springfield biology teacher Marty Perlaký said. "But the opportunity we can provide to our students is bigger than the commitment. It makes me a better teacher, but the real driving force behind why we get involved and why the BGSU professors write the grants is to make sure underprivileged and underserved kids get chances."



The NSTC is participating for the second year in the program, and its participating teachers from last year, Bryan Ellis, Laura Schetter and Stephen Oswanski, are mentoring their new Springfield High School faculty colleagues Perlaký, Austin Baker, Stephanie Mahoney, Coti Kilma, McKenna Reitz, and Matt Lucas, along with first-time NSTC participant Natalie Cook.

BGSU will provide scientists and other mentors for the students.

"We hope to have about 125 kids participating," Perlaký said of the Springfield contingent. NSTC anticipates another 100 of its students will take part. The goal of the project is to have 200 or more students in all.

The University received \$200,000 in funding, administered through NWO, from the Army Educational Outreach Program (AEOP), in collaboration with Battelle, which aims to address the "clear and alarming erosion in the nation's STEM capabilities, evident in both the skills gap plaguing major industries and students' lagging achievement in mathematics and science compared to peers around the world."

BGSU is one of only two organizations nationwide to receive the grant funding for a second year.

On a recent evening, the teachers shared dinner while Dr. Jodi Haney explained the expectations of the Ohio Junior Science and Humanities Symposium, how to frame research questions and objectives and complete each required section of the posters the students will make about their projects. Posters from the previous year's NSTC students' projects made good examples, and the center teachers also provided insight.

Haney, a BGSU professor emeritus of environmental science and teaching and learning, is a noted expert in hands-on, experiential learning in the STEM disciplines.

"By using this poster template and breaking it down into easily understandable parts, we can reduce the stress and fear the students might feel," Haney told the teachers. "We want to make them feel good about doing science by taking away the judging aspect and letting them feel the joy of discovery. It's a growth mindset."

"The true heroes in this are the teachers," said Duran, the principal investigator for the AEOP grant. "They work before, during and after school and on weekends on this. They strive to make the research relevant to the students and show its worth so they can feel pride. Also, generally teachers are not trained to be researchers, so we are giving them the support and skills they need to lead the students."

In addition, all participating teachers will be certified in Global Learning Observations to Benefit the Environment (GLOBE), an international science education program that promotes worldwide participation in data collection, data sharing and the scientific process – helping to foster not only the next generation of STEM professionals but also citizen scientists.

Duran, whose background is in biology as well as education, has also been director of the Ohio Junior Science and Humanities Symposium for 15 years and has been involved in numerous experiential learning initiatives in the sciences.

"But this is such a special project," he said. "Some of the students who participated last year said it was the most meaningful thing they'd ever done in their lives. It really built their self-esteem and their confidence. It was transformational."

"It's very powerful because the students have the choice of what they want to research, so these are authentic, student-driven projects. The grant also provides \$200 per person for supplies and equipment, so they can actually do the work."

Students so far have expressed interest in everything from astronomy to DNA to psychology to drones (one of which the NSTC has, for agricultural research). In addition to the resources of the Natural Science and Technology Center, Springfield has an area of wetlands behind its football fields that can serve as an excellent learning environment, Stearns said.

"Right now, we're getting the students thinking about what they might like to do," Perlaký said. "You never know where someone might go with it. The topics are all very self-directed and motivated, so they really have a stake in it. These are not science fair projects where the results are already known. These students are trying to find out things nobody knows, and we'll find the right mentor to work with them."

All these factors are extra important in schools where some students face tremendous economic and social challenges and disadvantages, Duran said.

NSTC urban agriculture teacher Bryan Ellis is a passionate advocate for the students and for giving them – many of whom have never been exposed – a better understanding of the natural world.

He is teaching them not only conventional methods of farming, raising tilapia, cultivating mushrooms, forestry, aquaculture, botany and more, "but also the newer and more sustainable practices," he said. "We're looking for the next great way of growing things. We have an inquiry-based science program."

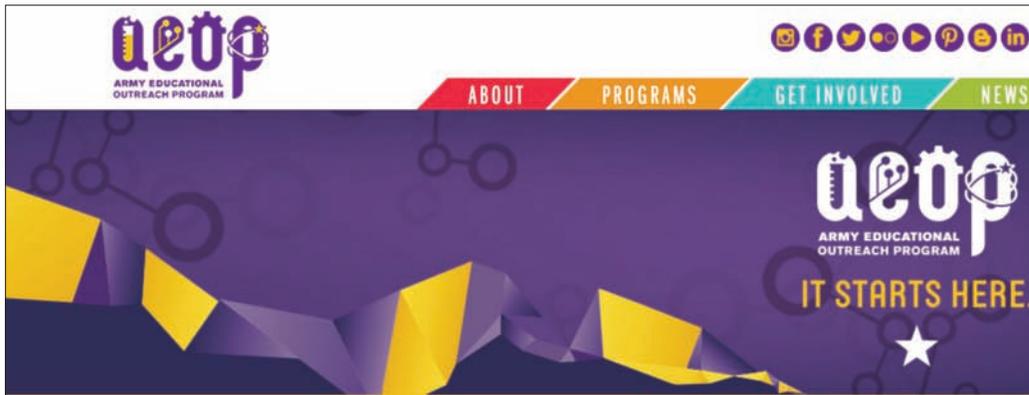
While they learn skills that prepare them for jobs, his students are also conducting experiments on such questions as whether invasive plants might actually sequester carbon in a way that's beneficial to native plants and which light spectrum most benefits the growth of hops.

Duran described NSTC's Ellis, Schetter and Oswanski as "independent thinkers," and all are energetic, enthusiastic proponents of the goals of the AEOP program.

"We were thrilled when we learned we had received a second round of funding so we could bring in even more students," Stearns said. "We witnessed last year how enthusiastic the students were and how they embraced the program. The teachers' relationship with them is really wonderful. They've even done activities like having evening campfires – these are special things you don't see very often."

Appendix G: Army Education Outreach Program (AEOP): Support for Ohio Junior Science & Humanities Symposium Recognition cont.

AEOP Recognition



The banner features the AEOP logo in the top left, a navigation menu with 'ABOUT', 'PROGRAMS', 'GET INVOLVED', and 'NEWS' in the top center, and social media icons for Instagram, Facebook, Twitter, YouTube, LinkedIn, and Pinterest in the top right. The background is a dark purple with a yellow and white geometric pattern and the text 'IT STARTS HERE.' with a star icon.

AEOP AWARDS PARTNER GRANTS TO INCREASE DIVERSE STUDENT ENGAGEMENT IN STEM

October 12, 2017 - USAEOP

COLUMBUS, OHIO (October 12, 2017): The Army Educational Outreach Program, in collaboration with Battelle, has awarded grants to five organizations and technical associations to expand student participation in enriching science, technology, engineering and math (STEM) exploration and learning, particularly for underserved students.

COLUMBUS, OHIO (October 12, 2017): The Army Educational Outreach Program, in collaboration with Battelle, has awarded grants to five organizations and technical associations to expand student participation in enriching science, technology, engineering and math (STEM) exploration and learning, particularly for underserved students. AEOP offers students, from elementary school through undergraduate education, and educators collaborative, high-quality, Army-sponsored programs that engage, inspire and attract the next generation of STEM talent.

Through AEOP's suite of programs, students representing all proficiency levels and ethnic, economic and academic backgrounds participate in real-world experiences involving STEM disciplines. Army civilian scientists and engineers serve as mentors and guides, bringing young people directly into Army laboratories and introducing them to the various opportunities in STEM fields through hands-on experiences.

AEOP engages a network of partners through Strategic Outreach Initiative grants to expand student participation in enriching STEM exploration and learning, particularly for underserved students. AEOP's latest cohort of partners—three new and two renewed, following an existing partnership—were selected specifically for their leadership in STEM learning and outreach to African-American, Hispanic, female, low-income and military-connected students. Bringing together the strongest thought and strategic partners also allows the Army's programs to better reflect the best of this diverse nation.

"The Army is committed to contributing to a technically skilled and capable workforce. Working with like-minded partners and networks, we have the potential to do this more effectively, leverage one another's strengths and reach a far broader and more diverse audience," Dr. Matt Willis, Director of Laboratory Management, Office of the Deputy Assistant Secretary of the Army for Research & Technology, said.

The U.S.'s STEM capabilities are critical to the nation's innovation, economic competitiveness and national security. Though the U.S. continues to make strides in STEM, research shows a clear and alarming erosion in the nation's STEM capabilities, evident in both the skills gap plaguing major industries and students' lagging achievement in mathematics and science compared to peers around the world. By leveraging the Army's strengths, and leaning on the strengths of partners, the Army has addressed this STEM crisis on multiple fronts, with promising results.

"Through hands-on learning, students see how they can excel in STEM careers," said Dr. Aimee Kennedy, Senior Vice President for Education, STEM Learning and Philanthropy at Battelle. "Whether in teams of peers or guided by a mentor, this kind of learning will help inspire the next generation of innovators."

Strategic Outreach Initiative grantees will each receive awards ranging from \$49,000 to \$200,000 to facilitate meaningful collaboration that will ultimately integrate with or enhance the suite of opportunities already offered by AEOP. Grants will be awarded on a rolling basis. Recipients include:

Northwest Ohio Center for Excellence in STEM Education at Bowling Green State University (Bowling Green, Ohio): NWO at BGSU will build upon a previously funded AEOP strategic outreach project to increase the number of underrepresented students participating in JSHS in March 2018, and beyond. NWO will recruit and train approximately 200 students from underserved populations and their teachers from Toledo Public and Springfield Local school districts to engage students in original scientific research and STEM studies. Under this model, the cadre of teachers from the previous year's grant project will serve as mentors to newly recruited teachers. In addition, all participating teachers will be certified in Global Learning Observations to Benefit the Environment, an international science education program that promotes worldwide participation in data collection, data sharing and the scientific process.

Appendix G: Army Education Outreach Program (AEOP): Support for Ohio Junior Science & Humanities Symposium Recognition cont.

AEOP Recognition

Ohio STEM Learning Network

LATEST NEWS & INFO

Students learn as drone pilots, quail farmers and more

Posted on January 30, 2018 in [Out of classroom](#), [STEM schools](#), [STEM training](#), [Students](#), [Teachers](#)
0 Comments



"A school full of animals and plants; that doesn't sound normal. But once you come here, and experience it, you realize how amazing it is."

— Teague Tafelski

The Toledo Natural Science Technology Center is anything but normal. Since 1975, it has been a part of Toledo Public Schools career tech program, offering students a hands-on education in environmental and natural science.

Their problem and inquiry based approaches toward Animal Science, Landscape and Turf, and Urban Agriculture attract students from six area high schools to spend the first half of their school days surrounded by plants and animals.

"As recently as 5 years ago, our enrollment here was down," explains Tom Dimitrew, Toledo Public Schools' Career Tech Director. Recently, though, things have changed.

"We've had an influx of a dynamic, young staff over the past three years. The district has really recognized increasingly what an incredible resource we have here, particularly in the context of urban education."

Plenty of students were excited to talk about their projects, all detailed in the slideshow below.



Chelsea Brogan and Jenna Lofgren raised a flock of quail. "We wanted to know what food would grow them up the fastest and the cheapest," explains Jenna. "Turns out it was chick food."

While the quail can be used as feeders for some of the other animals at the school, their eggs are in high demand at local farm-to-table restaurants like [Fowl](#) and [Fodder](#). They've already shipped out their first batch.

This approach is not unique at NSTC. Both environmentally and economically, everything at NSTC is about sustainability. When students conduct studies on animals and plants, the outcomes help sustain the school's ecosystem and provide products to the community.

On the other side of the building, Bryan Ellis shows off the school drone as part of the agriculture program.

"I can basically fly this unit over any field and, based on the data, the colors that are returned, I can tell you if your crops are nutrient deficient in anything," he says. "What this has done is tied my program to industry in a way that no other school ever has"

Students used this drone to evaluate runoff on their 10 acres, then developed a plan to mitigate their impact on the local water supply. These evaluations are in high demand, and Ellis has already secured several contracts with local farms.

"Two students have their pilots license for this thing already."



"This is where it becomes amazing for me," says Charlette Hornyak, "because I hated regular school; sitting down at the desk, being bored, not being able to move around."

Hornyak is the President of Toledo's chapter of the FFA, and with an agriculture job already lined up for her after graduation.



"This is science you can touch... This is science you can feel and see and eat."

"You actually get to experience what you're learning," comments fellow student Teague Tafelski. "I can't think of anything else I'd rather do with my day than be here."

School administration has only see enrollment go up in the past few years, and it shows no sign of stopping. Next year, they will pilot a brand-new Wildlife and Sustainability program. Students are excited.

"They've gone back to their home schools and recruited," mentions Bryan Ellis, "so it looks like it's going to be pretty full."

Appendix G: Army Education Outreach Program (AEOP): Support for Ohio Junior Science & Humanities Symposium Recognition cont.

AEOP Recognition

Monday, Jan 29, 2018 4:19 PM Show 28"

THE BLADE News • Sports • A&E • Business • Opinion • Jobs

EDUCATION

BGSU works with area schools to promote student research

By BONNIE BLANKINSHIP | SPECIAL TO THE BLADE
Published on Jan. 29, 2018

It's an unlikely setting in which to find a group of high school science teachers: gathered around tables in a concrete-floored, industrial style building, where a miniature Vietnamese pig snorts happily in her pen nearby, baby chicks and two pregnant Flemish giant rabbits share another pen and various types of mushrooms flourish in containers.

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TOLEDO NATURAL SCIENCE TECHNOLOGY CENTER student Charlette Hornyak works on a project in the greenhouse.

BOWLING GREEN STATE UNIVERSITY
[Enlarge](#)

"It's really important, and one of the four elements of the program [is] to have the bulk of the teachers in the same building so they can plan and work together," Mr. Duran said.

"It's a very big commitment," Springfield biology teacher Marty Perlaky said. "But the opportunity we can provide to our students is bigger than the commitment. It makes me a better teacher, but the real driving force behind why we get involved and why the BGSU professors write the grants is to make sure underprivileged and underserved kids get chances."

The center is participating for the second year in the program. The participating teachers from last year, Bryan Ellis, Laura Schetter, and Stephen Oswanski, are mentoring their new Springfield High School faculty colleagues Perlaky, Austin Baker, Stephanie Mahoney, Coti Klima, McKenna Reitz, and Matt Lucas, along with first-time center participant Natalie Cook.

BGSU will provide scientists and other mentors for the students.

"We hope to have about 125 kids participating," Mr. Perlaky said of the Springfield contingent. The center anticipates another 100 of its students will take part. The goal of the project is to have 200 or more students in all.

The university received \$200,000 in funding, administered through northwest Ohio, from the Army Educational Outreach Program, in collaboration with Battelle, which aims to address the "clear and alarming erosion in the nation's STEM capabilities, evident in both the skills gap plaguing major industries and students' lagging achievement in mathematics and science compared to peers around the world."

BGSU is one of only two organizations nationwide to receive the grant funding for a second year.

On a recent evening, the teachers shared dinner while professor Jodi Haney explained the expectations of the Ohio Junior Science and Humanities Symposium, how to frame research questions and objectives and complete each required section of the posters the students will make about their projects. Posters from the previous year's Natural Science and Technology Center students' projects made good examples, and the center teachers also provided insight.

Ms. Haney, a BGSU professor emeritus of environmental science and teaching and learning, is a noted expert in hands-on, experiential learning in the STEM disciplines.

"By using this poster template and breaking it down into easily understandable parts, we can reduce the stress and fear the students might feel," Ms. Haney told the teachers. "We want to make them feel good about doing science by taking away the judging aspect and letting them feel the joy of discovery. It's a growth mindset."

"The true heroes in this are the teachers," said Mr. Duran, the principal investigator for the Army grant. "They work before, during, and after school and on weekends on this. They strive to make the research relevant to the students and show its worth so they can feel pride. Also, generally teachers are not trained to be researchers, so we are giving them the support and skills they need to lead the students."

In addition, all participating teachers will be certified in Global Learning Observations to Benefit the Environment, an international science education program that promotes worldwide participation in data collection, data sharing and the scientific process — helping to foster not only the next generation of STEM professionals but also citizen scientists.

Mr. Duran, whose background is in biology as well as education, has also been director of the Ohio Junior Science and Humanities Symposium for 15 years and has been involved in numerous experiential learning initiatives in the sciences.

"But this is such a special project," he said. "Some of the students who participated last year said it was the most meaningful thing they'd ever done in their lives. It really built their self-esteem and their confidence. It was transformational."

"It's very powerful because the students have the choice of what they want to research, so these are authentic, student-driven projects. The grant also provides \$200 per person for supplies and equipment, so they can actually do the work."

Students so far have expressed interest in DNA, psychology, and drones (one of which the Natural Science and Technology Center has, for agricultural research). All these factors are extra important in schools where some students face tremendous economic and social challenges and disadvantages, Mr. Duran said.

Natural Science and Technology Center urban agriculture teacher Bryan Ellis is a passionate advocate for the students and for giving them — many of whom have never been exposed — a better understanding of the natural world.

He is teaching them not only conventional methods of farming, raising tilapia, cultivating mushrooms, forestry, aquaculture, botany, and more, "but also the newer and more sustainable practices," he said.

"We're looking for the next great way of growing things. We have an inquiry-based science program."

While they learn skills that prepare them for jobs, his students are also conducting experiments on such questions as whether invasive plants might actually sequester carbon in a way that's beneficial to native plants, and which light spectrum most benefits the growth of hops.

RELATED ITEMS: BOWLING GREEN STATE UNIVERSITY, FRANK DICK NATURAL SCIENCE AND TECHNOLOGY CENTER, BONNIE BLANKINSHIP

Appendix H: STEM in the Park Advertising & Recognition

FREE FAMILY EVENT



STEM
in the **PARK**TM
Science, Technology, Engineering, and Mathematics



Saturday, September 23, 2017
9:30 a.m. to 2:30 p.m. | Perry Field House
Bowling Green State University

SAVE TIME... Pre-register online! at www.STEMinthePark.org

BOWLING GREEN STATE UNIVERSITY



5 x 7 Postcard

Get Your **Wheels Turning** with **STEM!** TWO NEW ZONES for 2017

The **ALL WHEELS ZONE** featuring *The Right Direction - Rotate, Spin, and Roll into the ALL WHEELS ZONE where you will encounter all types of Wheels, Tires, and Gears.* Sponsored by Thayer Dealerships.



The **ROBOTICS ZONE** - Interact with organizations highlighting cutting edge technology that deals with the design, construction, operation, and application of robots.



STEM in the Park will feature interactive displays and activities created by area universities, community partners, and local businesses to engage children of all ages in science, technology, engineering, and mathematics.

Join us for a family day of **hands-on fun** at BGSU, featuring two **NEW** activity zones for 2017... **ALL WHEELS Zone** and **ROBOTICS Zone**. Back by popular demand is the **STEM Stage** featuring Super-Sized Demos from the Toledo Zoo and Imagination Station, along with returning activity zones **Digital Media Zone, Food Science Zone, H₂O Zone, Roots 2 STEM PreK-2 Zone, & Science of Sports Zone**. The outdoor **Musical Stage** under the tent will feature several performances by popular vocal and drumming groups like the TSA Steel Drum Band and the BGSU a cappella group AcousChicks (among several others).

FREE Lunch catered by Tony Packo's (while supplies last)

#GetyourSTEMon

Presenting Sponsors



Community Sponsors



General Sponsors



To view a complete list of all exhibitors check www.STEMinthePark.org

To our guests with disabilities, please indicate if you need special services, assistance or appropriate modifications to fully participate in this event by contacting Accessibility Services, access@bgsu.edu, 419-372-8455. Please notify us prior to the event.

17164640_082017_7.501

Appendix H STEM in the Park Advertising & Recognition cont.

Recruitment Email - Exhibitor



Exhibitor Registration is NOW OPEN for STEM in the Park 2017

September 23, 2017
9:30 a.m. - 2:30 p.m.
Perry Field House
BGSU

We are excited to invite you/your organization to participate with NWO at our Eighth Annual STEM in the Park event! Last year's event drew over 4,700 people! This is due to AMAZING exhibitors like YOU! This family day of exciting hands-on STEM activities is growing thanks to your participation!



Get Your Wheels Turning with STEM!

NEW ZONES IN 2017

The **ALL WHEELS ZONE**



Sponsored by Thayer Dealerships
 Featuring The Right Direction

Rotate, Spin, and Roll into the ALL WHEELS ZONE where you will encounter all types of Wheels, Tires, and Gears.

The Robotics Zone



Interact with organizations highlighting cutting edge technology that deals with the design, construction, operation, and application of robots.

RETURNING ZONES

H₂O Zone



Food Science Zone



Science of Sports Zone



Science & Technology of Digital Media Zone



What is STEM in the Park?

STEM in the Park offers hands-on, family-friendly science, technology, engineering, and mathematics activities, displays and/or equipment at a number of STEM Activity Stations arranged in an open, festival-like atmosphere. We invite you to select an activity or interactive display to bring to the event. In 2016, over 4,700 people including some 1,500+ children attended STEM in the Park with their parents, grandparents, teachers and neighbors. STEM in the Park is a highly visible and unique opportunity for businesses, universities, colleges, and non-profit organizations to increase awareness and showcase regional STEM opportunities, careers and innovation across northwest Ohio. We anticipate close to 5,000 being involved in the 2017 event.

NWO's STEM in the Park provides:

- An eight foot table
- Tablecloth
- Two chairs
- Free lunch for all of your station staff & volunteers
- Additional space or tables for large displays/activities is available
- Your company, college, department, or campus organization name will be featured on our website and in some larger marketing materials for this event
- Formatting of an At-Home Activity digital resource to post on our website

NEW for 2017; STEM in the Park is going green this year and will not be printing Take-Home Activity Cards for each station. We will be creating a *digital link* to all At-Home Activities to extend learning from the event. The At-Home Activities will include the same information as in the past but will simply be digital vs. printed.

Exhibitor provides:

- Hands-on activity plus materials for attendees to complete the activity
- The text for a STEM in the Park At-Home Activity (see example, if desired)
- Take-Home brochures and marketing material featuring your company, department, college or campus organization (if desired)



Registration:
 Please [click here to complete registration form](#)

Questions?
 Contact Jenna Pollock at NWO (jpolloc@bgsu.edu)
 Or
 Dr. Emilio Duran (eduram@bgsu.edu), School of Teaching and Learning

Information regarding the previous years' STEM in the Park events can be found at www.STEMinthePark.org

Appendix H STEM in the Park Advertising & Recognition cont.

Recruitment Email - Attendee



Science, Technology, Engineering, and Mathematics

MEET US AT THE PARK

For the **8th Annual STEM in the Park**

Saturday, September 23, 2017
9:30 a.m. - 2:30 p.m.
(NEW! Extended Hours!)

Held at the **Perry Field House**
Bowling Green State University

brought to you by...

Presenting Sponsors: BGSU, bp, First Solar, Lubrizol, PPG, verizon

Community Sponsors: The Commons, KWO, Rotary Club, SSOE, Thayer, TOYOTA

General Sponsors: Columbus Center, PROSPECT, Winesap

FREE Lunch catered by Tony Packo's (while supplies last)

SAVE TIME... Pre-Register Online!
(NEW & IMPROVED! Faster On-Site Check-In!)

[Click here to Pre-Register](#)
[BGSU Campus Map](#)

Get Your Wheels Turning with STEM! NEW ZONES IN 2017

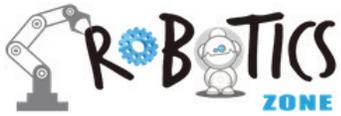
The ALL WHEELS ZONE



Sponsored by **Thayer Dealerships**
 Featuring *The Right Direction*

Rotate, Spin, and Roll into the ALL WHEELS ZONE where you will encounter all types of Wheels, Tires, and Gears.

The ROBOTICS ZONE



Interact with organizations highlighting cutting edge technology that deals with the design, construction, operation, and application of robots.

RETURNING ZONES

H₂O Zone **Food Science Zone**




Science of Sports Zone **Science & Technology of Digital Media Zone**






As part of our new **Food Science Zone**, we are once again teaming up with **Food for Thought** in an effort to help squash hunger. Please bring a food item or a basic household/personal care necessity with you to donate. All donations will once again stay in the BG Community and will be taken to the Cocoon Shelter. There will be a mobile pantry on site to accept your donations.

[Click here](#) to download a (pdf) that list all the things needed.

Thank you! Your generous support allows **Food for Thought** to continue serving our community in a thoughtful manner!

Visit the website for more info: <http://www.feeditledo.org/> 

Appendix H STEM in the Park Advertising & Recognition cont.

Back by Popular Demand in 2017!

The STEM Stages

The indoor STEM Stage features **Super-Sized Demos** from The **Toledo Zoo** and **Imagination Station** with a new show starting every 30 minutes.

The outdoor Musical Stage under the tent will feature several performances by popular vocal and drumming groups like the **TSA Steel Drum Band** and the **BGSU** a cappella group **AcousChicks** (among several others).

Roots 2 STEM Pre K-2 Zone

Featuring activities that cater specifically to younger children

HopeLine from Verizon

Donate your no-longer-used wireless phones, batteries and accessories in any condition from any service provider to benefit victims of domestic violence. HopeLine will have boxes at **STEM in the Park** for your donations.

Computer Equipment Recycling

Please bring your unwanted computer hardware equipment to recycle with **ERG Environmental Services** (i.e. laptop, keyboard, printer, mouse, tower)
PLEASE NO MONITORS

THANK YOU to the following organizations hosting Activity Stations this year!

For a complete list, please visit our website.

www.STEMinthepark.org

BGSU Architecture & Environmental Design Department
BGSU Aviation Department
BGSU College of Technology
BGSU College of Technology, Engineering Technology
BGSU Construction Management Dept.
BGSU Department of Public & Allied Health
BGSU Dept. of Architecture & Environmental Design
BGSU Dept. of Construction Management
BGSU Early Childhood Science Program
BGSU Herpetarium, Biological Sciences Department
BGSU Marine Biology
BGSU SPatial Literacy - SPLIT
BGSU School of the Earth Environment and Society
BGSU Swimming and Diving
BGSU Tau Beta Sigma
BGSU Visual Communication Technology
BGSU, Middle Childhood Science Education
Biology Graduate Student Association
Bowling Green Curling Club
Bowling Green Fire Division
Bowling Green Science Education Council
Challenger Learning Center of Lake Erie West
Costco Wholesale
GLOBE Mission EARTH
Girl Scouts of Western Ohio
HackBG
Horizon Science Academy Toledo
Imagination Station
Kids Tech University@BGSU
Metroparks Toledo
Nature's Nursery

New York Life Insurance Company
Ohio Northern University Engineering Education Program
Rain Garden Initiative
RallyCap Sports
SSCE GROUP
Sauder Village
Science & Math Education in ACTION
St. Ursula Academy
Sylvan Learning
Sylvania Historical Village
Technology First
The University of Findlay - Biology
Therapy Dogs International
Toledo Football Academy
Toledo Section of the American Chemical Society
Toledo Technology Academy
Toledo Zoo
University of Toledo SCOPE Program
University of Toledo STACS Program
Wood County District Public Library Children's Place
Wood County Park District
Wood Soil & Water Conservation District

Please visit our website for event details:

www.STEMinthepark.org

COSMOS BGSU, 241 Math/Sci Bldg., BGSU, Bowling Green, OH 43403

Appendix H STEM in the Park Advertising & Recognition cont.

STEM in the Park Recognition



All Wheels and Robotics theme of STEM in the Park, Sept. 23

TOPICS: STEM In The Park



Photos by Kara Fallon | BGSU

POSTED BY: DAVID DUPONT SEPTEMBER 11, 2017

STEM in the Park, a free, family day of hands-on displays and activities geared toward science, technology, engineering and mathematics at Bowling Green State University, will feature two new, must-see zones Sept. 23: All Wheels and Robotics.

Participants can get their wheels turning with STEM by encountering all types of wheels, tires and gears in motion in the All Wheels Zone. Sponsored by Thayer Dealerships, this zone features The Right Direction, a local organization whose mission is to empower youth by increasing action sports' impact and access as a tool for positive youth development.

"We are thrilled to have The Right Direction at STEM in the Park this year, especially because of its strong positive message for youth, its STEM application in physical science concepts and the high-energy demonstrations," said Jenna Pollock, STEM in the Park coordinator.

In the Robotics Zone, participants will interact with organizations that highlight cutting-edge technology involved with the design, construction, operation and application of robots.

More than 150 unique, hands-on STEM activity stations will be offered at STEM in the Park, which will take place from 9:30 a.m. to 2:30 p.m. at the Perry Field House. Community partners, local businesses and area universities created the interactive displays and activities to engage children of all ages in the STEM fields.

Back by popular demand for the eighth annual event are the Food Science Zone, the Digital Media Zone, the high-energy Science of Sports Zone and the H2O Zone, which explores the science behind all of water's amazing uses. As part of Food Science Zone, attendees are invited to bring a food or basic household/personal care item to donate to Food for Thoughts. Donations will be taken to the Cocoon Shelter. A Roots to STEM Pre K-2 Zone is also back this year, featuring activities that cater specifically to younger children.

The STEM stage will once again feature super-sized demos from the Imagination Station and the Toledo Zoo.

Activity station hosts include BGSU's Marine Lab and Herpetarium, SSOE, Verizon, Challenger Learning Center of Lake Erie West, Nature's Nursery, Toledo Zoo and more than 80 other institutions and organizations.

STEM in the Park is the brainchild of Drs. Emilio and Lena Duran, both faculty members in BGSU's College of Education and Human Development, and seeks to increase public engagement in the STEM disciplines in a family-friendly atmosphere.

The event allows participants to become a food technologist, dabble in robotics, launch pop rockets, pet lizards, take home free STEM activities and much more. Everyone who attends the event will receive take-home materials, activity ideas and a complimentary catered lunch from Tony Packo's. Parking is free.

NWO, the Northwest Ohio Center for Excellence in STEM Education, organizes the free event on campus and is committed to increasing attendance among low-income and at-risk children. For the fifth consecutive year, transportation will be provided for families from several school districts in urban and low-income neighborhoods. Nearly 4,700 people attended last year's event.

NWO is a partnership among area universities, K-12 schools and community partners, who all come together to showcase innovation and educational opportunities and promote positive attitudes toward STEM teaching and learning.

STEM in the Park presenting sponsors for 2017 are Bowling Green State University, BP, First Solar, Lubrizol, PPG and Verizon. In addition to NWO, community sponsors include Perrysburg Rotary Club, SSOE, Thayer Family Dealerships, Toyota, Wal-Mart and The Andersons. Bostdorff's, Columbia Gas of Ohio, Glass City Federal Credit Union, Partners in Education, Tony Packo's and Whirlpool comprise the general sponsor list.

Visit www.STEMinthePark.org for more information and to pre-register to attend the event.

###

Appendix H STEM in the Park Advertising & Recognition cont.

STEM in the Park Recognition



LATEST NEWS & INFO

Saturday, find STEM in the park in Northwest Ohio

Posted on September 19, 2017 in [Events](#), [MakerMinded](#), [Parents](#), [School leaders](#), [STEM schools](#), [Students](#), [Teachers](#)
[0 Comments](#)



Free hands-on fun and learning for all ages is the goal of STEM in the Park. The eighth annual event, featuring interactive displays and activities, musical performances and lunch, runs from 9:30 a.m. to 2:30 p.m. September 23 at the Perry Field House at Bowling Green State University (BGSU). To find out more, we contacted Susan Marie Stearns, assistant director of programming and development at the Northwest Ohio Center for Excellence in STEM Education at BGSU, which organizes the event:

Q: Give us an overview of STEM in the Park.

A: STEM in the Park was founded by Drs. Emilio and Lena Duran, both faculty members in the College of Education at BGSU. It was their idea to present hands-on and inquiry-based STEM activities in a fun and friendly atmosphere to engage people of all ages in these fields. This event has become our passion at the Northwest Ohio Center for Excellence in STEM Education, as we strive as a team to enlighten all participants in activities that are purposefully created to get our minds engaged in STEM.



Jenna Pollock is our coordinator, and each year she leads the effort with the Durans to bring amazing and colorful activities to this event that last year attracted nearly 4,700 people to our campus. We are very proud to offer this program at no cost to participants and include STEM takeaways to extend learning at home along with a lunch by local Toledo favorite Tony Packo's.

More than 150 unique, hands-on STEM activity stations will be offered at STEM in the Park. The event allows participants to "become" a food technologist, dabble in agricultural science, launch pop rockets, pet lizards, operate remote-controlled robots and much more.

Appendix H STEM in the Park Advertising & Recognition cont.

STEM in the Park Recognition

BGSU NEWS
ACADEMICS ADMISSIONS ABOUT ATHLETICS ALUMNI LIBRARIES RESEARCH STUDENTS INTERNATIONAL

STEM IN THE PARK | SEPT. 23

Bowling Green State University / News / 2017 / September / STEM in the Park | Sept. 23

This year's event at BGSU will feature new, must-see zones: All Wheels, Robotics



[Tweet](#) [Like](#) [Share](#)

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NWO is a partnership among area universities, K-12 schools and community partners, who all come together to showcase innovation and educational opportunities and promote positive attitudes toward STEM teaching and learning.

STEM in the Park presenting sponsors for 2017 are Bowling Green State University, BP, First Solar, Lubrizol, PPG and Verizon. In addition to NWO, community sponsors include Perrysburg Rotary Club, SSOE, Thayer Family Dealerships, Toyota, Wal-Mart and The Andersons. Bostdorff's, Columbia Gas of Ohio, Glass City Federal Credit Union, Partners in Education, Tony Packo's and Whirlpool comprise the general sponsor list.

Visit [STEM in the Park](#) for more information and to register.

Ohio STEM Learning Network



Saturday, find STEM in the park

Free hands-on fun and learning for all ages is the goal of STEM in the Park. The eighth annual event, featuring interactive displays and activities, musical performances and lunch, runs from 9:30 a.m. to 2:30 p.m. September 23 at the Perry Field House at Bowling Green State University (BGSU). To find out more, we contacted Susan Marie Stearns, assistant director of programming and development at the Northwest Ohio Center for Excellence in STEM Education at BGSU, which organizes the event:

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Appendix H STEM in the Park Advertising & Recognition cont.

STEM in the Park Recognition



September



1-22 Black Swamp Players
50th Anniversary Exhibit
3-4 WCDPL Closed for Labor
27 Ukulele for Beginners
10:30a
27 Faculty Artist Series: Cole
Burger, piano 8p
28 Drowning In Paper? 7p
28 International Film Series:
Mad Detective 7:30p
28 BGSU Wind Symphony 8p
30 2017 Hockey for Habitat 9a
30 Break-It Make-It with Home
Depot @ WCDPL 2p

SEPTEMBER 8, 9 & 10, 2017
ART • MUSIC • FOOD
WWW.BLACKSWAMPFEST.ORG



STEM
in the **PARK™**
Science, Technology, Engineering, and Mathematics

SATURDAY, SEPTEMBER 23, 2017
9:30 a.m. - 2:30 p.m.
Located the Perry Field House @ BGSU



Perrysburg Rotary Club

September 20 at 11:54am · 🌐

A big thank you to Jenna Pollock for giving us a great presentation on the upcoming BGSU STEM in the Park event!!

STEM in the Park is a free event for children and families to engage in Science, Technology, Engineering, and Mathematic activities!

The Perrysburg Rotary Club is a proud sponsor of STEM in the Park at BGSU!

Registration is still open! Click the link below for more information.
<http://www.bgsu.edu/nwo/programs/stem-in-the-park.html>



- Home
- About
- Photos
- Reviews
- Videos
- Events
- Posts
- Community

Create a Page

Appendix H STEM in the Park Advertising & Recognition cont.

STEM in the Park Recognition



Home > Event > STEM in the Park at BGSU

EVENTS

STEM in the Park at BGSU



Saturday, September 23, 2017
Perry Field House at BGSU
801 N. Mercer Road
Bowling Green, Ohio
9:30 AM – 2:30 PM (EST)

SSOE will be participating in a fun-filled day of STEM-based activities at STEM in the Park at BGSU. This family-friendly event features interactive displays and activities created by area universities, community partners, and local businesses to engage children of all ages in science, technology, engineering, and mathematics. STEM activities will take place at BGSU's Perry Field House and families will receive free lunch provided by Tony Packo's. Make sure to stop by and visit SSOE's volunteers, who will be helping participants build a motor and construct their own catapult—challenges that serve as playful introductions to the motor effect and Newton's Laws.

For more info on this event, [click here](#).

You can follow any responses to this entry through the **RSS** feed. Both comments and pings are currently closed.

Appendix H STEM in the Park Advertising & Recognition cont.

STEM in the Park Recognition

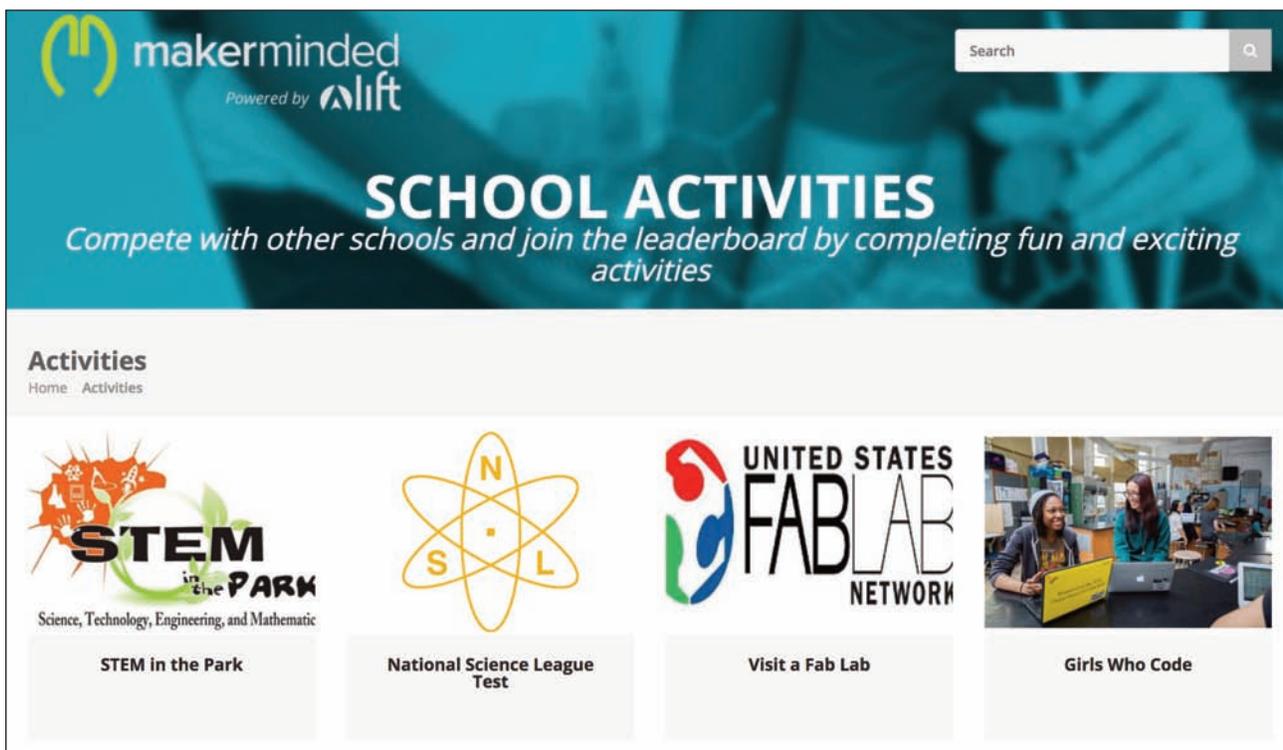


The poster features two photographs: one of a boy in a blue shirt and yellow hard hat working with a woman, and another of two girls looking through a microscope. The text on the poster reads: "STEM IN THE PARK Saturday, Sept. 23 | 9:30 a.m. to 2:30 p.m. | Perry Field House". To the right, a paragraph describes the event as a free community event coordinated by the Northwest Ohio Center for Excellence in STEM Education (NWO) at BGSU, featuring over 150 interactive displays and hands-on activities. A logo for "STEM in the PARK" is also present, with the tagline "Science, Technology, Engineering, and Mathematics" and the website "www.STEMinthePark.org".

STEM IN THE PARK
Saturday, Sept. 23 | 9:30 a.m. to 2:30 p.m. | Perry Field House

STEM in the Park is a **FREE** community event coordinated by the Northwest Ohio Center for Excellence in STEM Education (NWO) at BGSU that was created to get people of all ages excited about STEM (Science, Technology, Engineering, and Mathematics). This popular event features over 150 interactive displays and hands-on activities created by area universities, community partners, and local businesses to engage people of all ages in science, technology, engineering, and mathematics. A **FREE** lunch is offered along with at-home activities.

STEM in the PARK
Science, Technology, Engineering, and Mathematics
www.STEMinthePark.org



The webpage header includes the "maker minded" logo (Powered by lift) and a search bar. The main heading is "SCHOOL ACTIVITIES" with the subtext "Compete with other schools and join the leaderboard by completing fun and exciting activities". Below this, there are four activity cards: "STEM in the Park" (Science, Technology, Engineering, and Mathematics), "National Science League Test" (represented by a stylized atom logo), "Visit a Fab Lab" (United States Fab Lab Network logo), and "Girls Who Code" (represented by a photo of two girls at a laptop).

maker minded
Powered by lift

Search

SCHOOL ACTIVITIES

Compete with other schools and join the leaderboard by completing fun and exciting activities

Activities
Home · Activities

- STEM in the PARK**
Science, Technology, Engineering, and Mathematics
- National Science League Test**
- Visit a Fab Lab**
UNITED STATES FAB LAB NETWORK
- Girls Who Code**

Appendix H STEM in the Park Advertising & Recognition cont.

STEM in the Park Recognition



13abc THIS IS HOME

News Weather Sports Special Reports Live Live Newscasts

LIVE: STEM in the Park

BGSU is hosting a free day of family fun through Science, Technology, Engineering and Mathematics.

9:16 70°
13abc
@13abc

Appendix H STEM in the Park Advertising & Recognition cont.

STEM in the Park Recognition



STEM on the Park embraces every day science & fun

TOPICS: STEM In The Park



Misty Lovejoy helps young STEM in the Park attendee try out a trombone.

POSTED BY: DAVID DUPONT SEPTEMBER 23, 2017
By DAVID DUPONT

BG Independent News

The STEM disciplines – science, technology, engineering and mathematics – are infused in daily living.

Don't believe it? Take a stroll through STEM in the Park that sprawled inside and outside of the Bowling Green State University Field House Saturday. You'll see feats of engineering, and owls, starfish and other fauna from around the world, and bottles with multicolored water that illustrate the ocean layers. You'll also see kids making pizza dough, and taking those first tentative sounds on musical instruments.

You'll see kids tumbling and watching bubbles float high above them.

And don't forget the slime. That was the favorite of Melissa Works' four children, age 4 to 10.

Logan, 8, was especially enthusiastic about the slime, his sister Rozlyn, 6, liked the bubbles and gymnastics, and all including Benjamin, 10, and Serena, 4, were enjoying the free hot dog and mac and cheese lunch provided by Tony Packo's. Well, Serena was more interested in leaving her mark with a crayon to the paper table coverings.



Work said that the activities held the interest of her crew. They still had the outside to explore, she said.

This is the eighth year the event has been staged on the campus of Bowling Green State University, Emilio Duran, who teaches in the College of Education and Human Development, said the idea for the event first occurred to him and his wife, Lena Duran, who also teaches in the college.

The college, they realized, offers many events for students and teachers. "We wanted to do something for families," Duran said. "This is a community event. It's about learning about science together."

The event is presented by Northwest Ohio Center for Excellence in STEM Education.

People don't realize that STEM can be fun, he said.

The first year drew about 1,200 people. "It keeps growing and growing."

Duran estimates about 6,000 people will attend STEM in the Park this year. There are more booths, about 160 and activities about 180.

"It's all hands-on," Duran said. "This is the essence of the event. You always have to do something. That's how you learn science, not observing and listening. You do science."

Those activities appeal to a range of ages.

The organizers work all year, he said. Much of that work involves rounding up the corporate support that makes the event possible.

Student volunteers working at booths are another key element, he said.



Three students in the Academic Investment in Mathematics and Science program were taking a lunch break from their volunteer duties.

Griffin Spilman, who is studying to be a veterinarian, was helping kids make kaleidoscopes.

He, Denaja Haygood, and Kapri Burnett said they all enjoyed seeing how they kids reacted to the various activities.

"It's nice to see the excitement on their faces," Haygood, a biochemistry major, said.

"I was very passionate about science at a young age," Burnett, who is studying forensic biology, said. "Helping to expose kids to science is something I'm very happy about."

Duran said the event gives students a chance to interact with people from Bowling Green and the surrounding area.

"Most of the people here are local," Spilman, who comes from Cincinnati, said. "It's nice to see the community I'm going to be part of for the next few years."

Jeff Gonzales had brought his two young sons up from Bryan for the event at the urging of his wife, who had to work.

His mother, Beverly Gonzalez, said she'd also heard of the event and thought it'd be a great activity for her grandsons, Manny, 6, and Israel, 4.

He liked that STEM in the Park gave them exposure to so many aspects of science and technology.

"Robots and sports," Beverly Gonzalez said.

Manny said he liked the tumbling, and the robots as well as the introduction to curling. Israel liked watching the stunt biking.

Jeff Gonzalez said it was great that the boys got to try all sorts of activities. It shows them fields "they might want to go into."

For all the bustle and buzz of having so many excited kids, Beverly Gonzalez was impressed at how well organized the event was.

"This is the day everyone looks forward to," Duran said. "We make a lot of people happy today. We count our success by how many smiles we get. It's priceless."

Appendix H STEM in the Park Advertising & Recognition cont.

STEM in the Park Recognition

Sentinel-Tribune



Good clean fun at STEM in the Park

Story Comments

Print Font Size: - +

Posted: Monday, September 25, 2017 9:28 am

Photo by J.D. Pooley/Sentinel-Tribune

Jakeyvon McNeal, 6, of Toledo, plays in bubbles with other kids inside the H2O Zone at the annual STEM in the Park event at Perry Field House on the campus of Bowling Green State University on Saturday morning. Along with the H2O Zone the event featured a Food Science Zone, Digital Media Zone and High-Energy Science of Sports Zone among others. As part of the Food Science Zone, attendees were invited to bring a food or basic household/personal care item to donate to Food for Thought. Donations were being taken to The Cocoon.

Appendix H STEM in the Park Advertising & Recognition cont.

STEM in the Park Recognition

Bowling Green Falcons



Falcons Take Part in STEM in the Park
BGSU student-athletes volunteer their time at event at Perry Field House
BOWLING GREEN, Ohio (BGSU Athletic Communications)
Women's Basketball
Posted: Wed, Sep, 27

The Bowling Green State University women's basketball team participated in the 8th annual STEM in the Park on Saturday (Sept. 23). Members of the Falcons volunteered their time and worked with local children at the event at the Perry Field House.

PHOTOS

STEM (Science, Technology, Engineering and Mathematics) in the Park is a free annual event held each September at BGSU. The event features interactive displays and activities created by area universities, community partners and local businesses to engage children of all ages in the STEM fields.

At the BGSU Women's Basketball station, participants could practice their shot and learn a little more about basketball using technology. The BG student-athletes had iPads with a software program that helped track the arc of the shot and broke down other factors involved in shooting.

The players, and the software program, explained to the participants the benefits of having good arc on their shot and the rotation of the ball.

A few photos from Saturday's event are available by clicking the link near the top of the page.

#WeAreBG
#WBCADayofService
#AyZiggy

We had a blast spending our [#WBCADayofService](#) with all of the kids at STEM in the Park! [@wbca1981 pic.twitter.com/zGj0vVO894](#)

— BGSU WBB (@BGSUwbb) [September 27, 2017](#)

Copyright ©2017 Bowling Green Falcons

Appendix H STEM in the Park Advertising & Recognition cont.

STEM in the Park Recognition

THE BLADE

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BOWLING GREEN – Bowling Green State University will host STEM in the Park, a day of hands-on displays and activities geared toward science, technology, engineering, and mathematics, on Saturday.

More than 150 STEM activity stations will be offered for all ages at the eighth annual event, which will take place from 9:30 a.m. to 2:30 p.m. at the Perry Field House.

Everyone who attends the event will receive take-home materials, activity ideas, and a complimentary catered lunch from Tony Packo's.

Visit steminthepark.org for more information or to pre-register. Attendees are asked to bring a food or basic household/personal care item to donate to the Cocoon Shelter. Parking is free.



Jasiah Turner, 11, left, watches as Kaiden Dobosu, 12, pulls the cord to release their bottle rocket powered by water during a STEM learning event at Glendale-Feilbach Elementary School in Toledo in May. Bowling Green State University is set to host a STEM learning event with more than 150 activity stations.

THE BLADE/KATIE RAUSCH
[Enlarge](#) | [Buy This Image](#)

Appendix I: Women in STEM Advertising

Recruitment Email - Attendee



**Women
in
STEM**
Science, Technology, Engineering, & Mathematics

Empowering young women in science, technology, engineering, and mathematics. Fostering confidence and inspiration.

Tuesday, October 31, 2017



For 6th through 8th Grade Girls

NWO is excited to announce the 33rd annual **Women in STEM** program at Bowling Green State University for 6th, 7th and 8th grade girls.

A full day of fun-filled and interactive learning experiences for young women led by area STEM professionals!

Each school is limited to 20 students, please register by October 1, 2017.

The goal of the **Women in STEM** program is to provide a rewarding experience for 6th - 8th grade girls that connects STEM education to the real world and sparks an interest in pursuing STEM majors in college and ultimately STEM careers.

Women in STEM provides young women with a positive experience at BGSU and offers them a variety of engaging hands-on activities that allows them the opportunity to learn and interact with successful STEM role models. Break out sessions held during the program will provide hands-on, fun-filled, critical thinking/learning activities. The ultimate goal of this program is to help young women recognize the wide array of options available in STEM fields that inspire them to take classes in the STEM fields throughout their educational careers.

Schedule:

8:30 - 9:00 AM	Schools Check-In
9:00 - 9:05 AM	Welcome
9:05 - 9:45 AM	Imagination Station
9:55 - 10:40 AM	Session 1
10:50 - 11:35 AM	Session 2/Lunch A
11:45 - 12:30 PM	Session 3/Lunch B
12:40 - 1:25 PM	Session 4
1:35 - 2:00 PM	Closing Activities
2:00 - 2:30 PM	Adjournment and Departure

Fee: (includes lunch)

- Students - \$20
- Adults - \$20

Notes:

- Groups need to arrive by 8:30 am.
- Each school is limited to 20 students.
- Each group of students must be accompanied by a teacher or parent throughout the day (one adult per 10 students is recommended). No more than 4 adults per school.
- Adults and chaperones need to register and attend all sessions with students.
- Campus maps, parking permits, and additional information will be sent to the registered adults from each school.

Please note: There may be reptiles, including snakes at the hands-on activities.

Students attending this program will:

- Get first hand exposure to STEM education outside of the classroom.
- Have one-on-one interactions with women in STEM role models from various STEM careers.
- Engage in fun and exciting hands-on activities throughout the day that demonstrate how science, technology, engineering and mathematics is involved in everyday life experiences.
- Meet other regional students and learn from and with peers.
- Experience STEM programs in a college setting that fosters confidence in academic abilities while creating a greater vision of the STEM fields.
- Learn the facts about women's roles in STEM fields and see how they can make a difference in the world through STEM education.

School Registration

Please click on the link below to register students.
<https://goo.gl/forms/swVSc3K7TTxjoUMI2>

Registration deadline is October 1, 2017

For additional details visit the **Women in STEM** webpage at:
<http://www.bgsu.edu/nwo/programs/women-in-stem.html>

To our guests with disabilities, please indicate if you need special services, assistance or appropriate modifications to fully participate in this event by contacting Accessibility Services, access@bgsu.edu, 419-372-8495. Please notify us prior to the event.

Sponsored in part by:



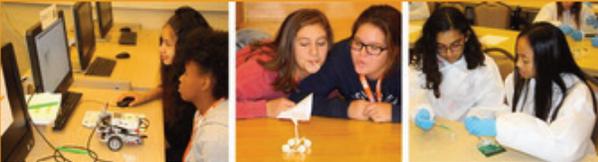
Appendix I: Women in STEM Advertising cont.

Recruitment Email - Presenter



Empowering young women in science, technology, engineering, and mathematics. Fostering confidence and inspiration.

Friday, October 31, 2017



For 6th through 8th Grade Girls

Presentation Proposals are now being accepted for the 33rd Annual Women in STEM program!

The goal of the **Women in STEM** program at BGSU is to provide a rewarding experience for 6th - 8th grade girls that connects STEM education to the real world and sparks an interest in pursuing STEM majors in college and ultimately STEM careers.

Women in STEM provides young women with a positive experience at BGSU and offers them a variety of engaging hands-on activities that allows them the opportunity to learn and interact with a wide variety of successful STEM role models.

The day will begin with a keynote presentation followed by break out sessions that provide hands-on, fun-filled, critical thinking/learning activities. **Women in STEM** will help young women recognize the wide array of options available in STEM fields, inspiring them to take classes in the STEM fields throughout their educational careers.

There will be groups of approximately 15 -20 girls with adult supervision in each break-out session. Sessions should include innovative and creative hands-on activities that are fun-filled and engaging. We would like to foster a collaborative growth-minded atmosphere in the breakout sessions that gives students opportunities to interact with one another and YOU as a STEM academic/career role model.

We rely on the support of our presenters and volunteers like you in order to continue to provide this unique experience for this age group of girls. We are thrilled to host the 33rd annual Women in STEM program at BGSU and look forward to your participation!

We invite submission of proposals for presentations at the 2017 Women in STEM on Friday, October 31st at Bowling Green State University.

We provide classroom and/or lab space, AV equipment and support.

Please click the link below to apply to be a presenter.

<https://docs.google.com/forms/d/1jVi6dB9jHRnw-kNvP30ADnZQSJWDkDPg-YEHJJF80s8/viewform>

Registration Deadline: October 1, 2017

You will be notified of your presentation acceptance to present by October 6, 2017.

Schedule:

9:55 - 10:40 AM (Session 1)
10:50 - 11:35 PM (Session 2/Lunch A)
11:45 - 12:30 PM (Session 3/Lunch B)
12:40 - 1:25 PM (Session 4)

All presenters are welcome to attend the keynote presentation and are invited to enjoy lunch on campus.

Sponsored in part by:

BGSU

