2018 NWO SYMPOSIUM

NEW Highlight for 2018

The Symposium will host an Education Resource Fair, where local educational resource providers will showcase classroom resources and services available for teachers and students.

A STEM Education Professional Development Conference for preK-12 in-service and pre-service teachers, informal educators, administrators and college faculty.

Saturday
November 17, 2018
8:45 a.m. to 3:00 p.m.

Olscamp Hall
Bowling Green State University

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

bgsu.edu/nwosymposium

BOWLING GREEN STATE UNIVERSITY BGSU

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Let's get trending!
Include #NWOsymposium
on all of your posts!

8:00 – 8:45 a.m. . . . . Registration (Outside Olscamp Hall: Room 101)

9:00 – 9:50 a.m. . . . . Block A

10:00 – 10:50 a.m. . . . . Block B

11:00 – 11:50 a.m. . . . . Block C

12:00 – 1:30 p.m. . . . . Lunch & Education Resource Fair

1:45 – 2:35 p.m. . . . . Block D

2:40 – 3:00 p.m. . . . . Closing/Raffle

NWO Symposium Evaluation

Please complete the online evaluation for the 2018 Symposium. All who complete the survey will be entered into a drawing for a $25 Amazon.com gift card.

A contact hours certificate can be requested at the completion of the evaluation survey. The certificate will be emailed to you approximately 2 weeks after the event.

EDUCATION RESOURCE FAIR PROVIDERS

American Chemical Society

Challenger Learning Center of Lake Erie West

Chase STEMM Academy

Feed the World

GrowNextGen.org

Maumee Greens

Mrs.Geeky, LLC

NWOET / INFOhio

National Association of Biology Teachers

National Inventors Hall of Fame

ODNR Division of Wildlife - Project Wild

Ohio State University Extension

Professional Land Surveyors of Ohio, Inc.

STEM is Elementary

Science Education Council of Ohio (SECO)

Sylvania Historical Village

Texas Instruments

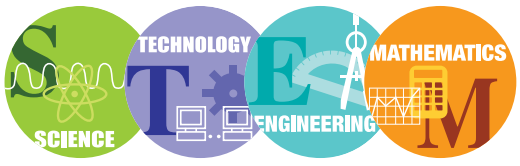
Toledo GROWs

Toledo Lucas County Public Library

University of Toledo SCOPE Program

University of Toledo-GLOBE

WBGU-TV



OLSC = Olscamp Hall

8:00 – 8:45 a.m.	**Registration (Outside Olscamp Hall: Room 101)**					
Room #	**OLSC 120**	**OLSC 201**	**OLSC 208**	**OLSC 225**	**OLSC 117**	**OLSC 113**
Block A: 9:00 – 9:50 a.m.	Mathematics A1	Engineering A2	Putting Creativity to Work A3	STEM in the Community A4	Mathematics A5	Mathematics A6
Block B: 10:00 – 10:50 a.m.	STEM in the Community B1	Science B2	Mathematics B3	Engineering B4	Integrating Technology B5	STEM in the Community B6
Block C: 11:00 – 11:50 a.m.	Mathematics C1	Putting Creativity to Work C2	STEM in the Community C3	Integrating Technology C4	STEM in the Community C5	Science C6
Lunch & Resource Fair OLSC 101: 12:00 – 1:30 p.m.	**Education Resource Fair (Olscamp Hall: Room 101)**					
Block D: 1:45 – 2:35p.m.	Integrating Technology D1	Integrating Technology D2	Science D3	Putting Creativity to Work D4	Mathematics D5	

Room #	**OLSC 203**	**OLSC 106**	**OLSC 219**	**OLSC 221**	**OLSC 223**
Block A: 9:00 – 9:50 a.m.	A7	Integrating Technology A8	STEM in the Community A9	Science A10	Science A11
Block B: 10:00 – 10:50 a.m.	Science B7	Mathematics B8	Mathematics B9	Science B10	Putting Creativity to Work B11
Block C: 11:00 – 11:50 a.m.	Science C7	Putting Creativity to Work C8	Science C9	Mathematics C10	Engineering C11
Lunch & Resource Fair OLSC 101: 12:00 – 1:30 p.m.	**Education Resource Fair (Olscamp Hall: Room 101)**				
Block D: 1:45 – 2:35 p.m.	STEM in the Community D7	Integrating Technology D8	Integrating Technology D9	Putting Creativity to Work D10	STEM in the Community D11

2018 NWO SYMPOSIUM STRANDS

Teaching and Learning in ENGINEERING

A rapidly growing population and ever more complex systems of human interaction demand innovation and perseverance to solve the important social, economic, health, and environmental problems we face everyday. Engineering is key to solving these problems, and more emphasis is currently being placed on integrating engineering concepts into the classroom. Sessions in this strand will focus on deepening your engineering knowledge and/or exploring interesting and effective ways to teach engineering.

Teaching and Learning in SCIENCE

There is no doubt that science is central to our lives. Never before has our world been so complex and science knowledge so critical to making sense of it all. It is paramount, therefore, that our students have a solid science education. Sessions in this strand will focus on deepening your science knowledge and/or exploring interesting and effective ways to teach science.

Teaching and Learning in MATHEMATICS

In today's world, we are bombarded with data that must be absorbed, sorted, organized, and used to make decisions. Mathematics teaches ways of thinking that are vital to work and civic life, and it is essential that mathematics education imparts these patterns of thought. Sessions in this strand will focus on deepening your mathematics knowledge and/or exploring interesting and effective ways to teach mathematics.

STEM in the Community: Thinking Outside the Classroom

Making STEM relevant for students is critical in improving their motivation and learning. Showing students the applications of STEM outside the classroom is a great way to get them engaged. Sessions in this strand will demonstrate ways that community resources and informal or non-traditional education settings can be used to supplement and support your STEM teaching efforts.

Integrating Technology in the Classroom

Technology is ubiquitous, touching almost every part of our lives, our communities, and our homes. Technology in education can engage and challenge students with new and interactive methods, and can allow teachers to reach their students in new and ever more effective ways. Sessions in this strand will demonstrate how to effectively use technology in STEM teaching.

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 and creative ways to teach STEM.

A1 Math Labs to Engage Student Learning

Participants will be engaged in hands on math labs to encourage students learning. Instructions, materials lists and copies of materials will be available for teacher use.

Presented by: Sharon Cichocki, Buffalo

Grade Levels: 9 - 12 ***Room:*** Olscamp 120

Strand: Teaching and Learning in MATHEMATICS

A2 Space In Your Place: NASA Resources

Have you ever wanted to use NASA resources for your class? Have you wondered where to go and how to find these resources? In this program we will go over a number of free NASA resources that can be easily added to your lesson plans! Learn about the Let It Glide Engineering Design Challenge and design your own glider! If you are looking for a great way to add new and exciting activities to your class, look to the stars and learn from NASA and the Challenger Learning Center of Lake Erie West!

Presented by: Tyler O'Brien, Challenger Learning Center

Grade Levels: PreK - 4, 5 - 8, 9 - 12, College ***Room:*** Olscamp 201

Strand: Teaching and Learning in Engineering

A3 The Collab Lab at BGSU

Attendees to this session will learn about our approach to designing and programming the Collab Lab, a hands-on creative space where students, faculty, staff, and community members engage in collaborative work. The session will include a summary of our research and descriptions of our promotion and advancement activities as well as a demonstration of the types of exercises we use to promote creativity and innovation through the framework of design thinking.

Presented by: Jerry Schnepp, Bowling Green State University

Grade Levels: College / University Faculty or Staff ***Room:*** Olscamp 208

Strand: Putting Creativity to Work: Teaching STEM With Innovation

A4 Using Competitive Robotics to Teach STEM Outside and Inside Classroom

Competitive robotics has become a cultural phenomenon. Worldwide the VEX platform effects over 200,000 students and is the most cost effective platform. Students engage in STEM activities to solve game challenges which when done properly cause students to increase knowledge and show creativity growth. Students involved in robotics increase the likelihood of both scholarships and future success. This presentation will consist of teacher handout with websites, budget and contacts. Also present will be two co-presenter students who are current undergrads, discussing the effects of the program on their lives and career choices. There will be two robots to show the platform for both elementary educators and secondary educators.

Presented by: Jeff Demaray, Technology First

Grade Levels: 5 - 8, 9 - 12, College ***Room:*** Olscamp 225

Strand: STEM in the Community: Thinking Outside the Classroom

A5 Teaching Math Effectively: Data, Resources & Strategies

What resources are available to help with the revised standards and how can you use data effectively? I served on the standards revision and model curriculum committees and will share resources I think are helpful. Information will also be shared about how to use Value-Added data to guide instruction. Finally, what is the GAISE model and how can it be used? A simplistic overview will be given.

Presented by: Gary Herman

Grade Levels: PreK - 4, 5 - 8, 9 - 12 ***Room:*** Olscamp 117

Strand: Teaching and Learning in MATHEMATICS

A6 Various Methods to Find Pythagorean Triples

I will show and prove various methods for finding Pythagorean Triples. Some methods are very simple and some are common sense. I found a very simple method for finding ones that are relatively prime. The Pythagorean Triples make it easier for students when all sides are natural numbers.

Presented by: Beryl Stemen, Owens Community College, Lourdes University, Henry Ford College

Grade Levels: 9 - 12 ***Room:*** Olscamp 113

Strand: Teaching and Learning in MATHEMATICS

A7/ B7 Project Wild/Growing Up Wild

NOTE: THIS SESSION IS FOR BGSU EARLY CHILDHOOD STUDENTS WHO HAVE REGISTERED ONLY. DOUBLE SESSION

Add this great environmental education curriculum to your classroom! Project Wild and Growing up Wild provide teachers with all the resources they need to include wildlife concepts into their lesson plans and way to incorporate science, math, literacy, and language arts. I will be giving a brief overview of what Project Wild is and how it can be used in the classroom. I will then run through a number of activities with the group from the curriculum. Finally, I will wrap up by giving the group information on future education with Project Wild.

Presented by: Meredith Gilbert, ODNR Division of Wildlife

Grade Levels: PreK - 4, 5 - 8, 9 - 12 ***Room:*** Olscamp 203

Strand: Teaching & Learning in Science

A8 FREE STEAM Resources from INFOhio, Ohio's PreK-12 Digital Library

We'll explore free STEAM digital resources that include videos, lesson plans, encyclopedia and periodical articles, interactive experiments, online courses, posters, diagrams, tutorials, practice tests, ebooks, and even more available from INFOhio and learn how these resources can be easily transferred with one click into assignments and questions in Google Classroom or stored on Google Drive. This presentation will include attendees with devices (even smart phones) reviewing, hands-on, the STEAM resources available from the INFOhio website. Those teachers using Google Classroom with students will go through creating an assignment using one of the resources, while those using an alternative learning management system will be shown how to 'save' their chosen resources to their Google Drive or one of the other 'save' options.

Presented by: Judith Tucker, NWOET (Northwest Ohio Educational Technology Foundation)

Grade Levels: PreK - 4, 5 - 8, 9 - 12 ***Room:*** Olscamp 106

Strand: Integrating Technology in the Classroom

A9 Lettuce turnip the beet! STEM in the garden!

Come with your sleeves rolled up and your thinking caps on! Gardens are more than just planting, they can be used as outdoor classrooms to teach all kinds of STEM topics. Each participant will get to take home engaging curriculum and youth garden resources. Gardens are such a unique place for children to learn and grow. In this presentation learn how to bring classroom topics into a nature setting with a fun, hands-on flair. Participants will get the opportunity to see how STEM education components come to life in a garden. This is a learning by doing program and everyone will get to be a student again. Each participant will get to take home engaging curriculum instructions, resources for gardening in the classroom, and a list of grants that schools and community gardens serving youth can apply for. Come with your thinking cap turned on and your sleeves rolled up, it's time to get your hands dirty for science!

Presented by: Hannah Halfhill, Toledo GROWs

Grade Levels: PreK - 4, 5 - 8 ***Room:*** Olscamp 219

Strand: STEM in the Community: Thinking Outside the Classroom

A10 Viruses – From Adenovirus to HIV to Zika

Participants will explore how to incorporate engaging 3D-models of viruses that students can click on to rotate and view from different angles. Also, participants will learn about materials that can be incorporated into the classroom to allow students to explore the criteria that scientists use to classify viruses, the characteristics of different viruses, and the global prevalence of viral infections. I will be showing participants how to access the HHMI Biointeractive website and the multitude of free, teacher created resources that HHMI provides. The focus on this presentation will be to show a small sample of the viral content that HHMI has. I will focus on the virus explorer and it's use in the classroom, as will as showcase materials over genetically modified mosquitos and ebola.

Presented by: Chris Monsour, Tiffin Columbian High School

Grade Levels: 9 - 12, College ***Room:*** Olscamp 221

Strand: Teaching & Learning in Science

A11 National Inventors Hall of Fame Innovation Ecosystem

Turn students into inventors with the National Inventors Hall of Fame's Innovation Ecosystem. The Innovation Ecosystem was created in 1990 when we launched our nationally acclaimed flagship program, Camp Invention. Building on the success of Camp Invention, we have developed an entire network of programs designed to promote a life-time of innovative learning. This network of Pre-K-college level programming has impacted over 2 million students, parents, educators and inventors. Participants in this presentation will experience hands-on, innovative, 21st Century STEM education curricula. Research shows that exposure to innovation substantially increases the chances that children will become inventors.

Presented by: Chrystal Manos, National Inventors Hall of Fame

Grade Levels: PreK - 4, 5 - 8 ***Room:*** Olscamp 223

Strand: Teaching & Learning in Science

BLOCK B: 10:00 - 10:50 A.M.

B1 History Einsteins: Fun and Engaging Ways to Work STEM Content into Social Studies and Other Subjects.

Join in this engaging hands on workshop that shows how you can include STEM content into other subjects particularly Social Studies. The staff of the Sylvania Historical Village will also show you how you can effectively and creatively use local and regional information education and cultural organizations to enhance your students' STEM education. We'll provide resources plus actual projects you can replicate in the classroom. We will share with the teachers how they can use local and regional informal education resources (such as history museums, zoos, and art centers) to enhance STEM understanding in creative ways. We'll do a hands on activity that teachers can replicate in their classroom and provide other resources for content.

Presented by: Andi Erbskorg, Sylvania Historical Village

Grade Levels: PreK - 4, 5 - 8, 9 - 12 ***Room:*** Olscamp 120

Strand: STEM in the Community: Thinking Outside the Classroom

B2 Exercising the Scientific Method in Early Childhood Environments-Prek-K

Participants will be learn how to apply the scientific method in PreK-K classes using evidence based strategies that are developmentally appropriate and engaging for little learners within small and whole group instructional settings. The presentation will provide strategies and resources for educators to plan and implement how to teach the scientific method to support critical thinking and cognitive rigor that is suitable for early childhood environments PreK-K.

Presented by: Melissa Romero, Educational Service Center of Lake Erie West

Grade Levels: PreK - 4 ***Room:*** Olscamp 117

Strand: Teaching and Learning in SCIENCE

B3 How to Turn Your Classroom into a Math Escape Room, Plan a Family Math Night, and Create a STEM Program for Middle School Students

As a 4th year math and science teacher (grade 5), participants will be able to learn how to plan different math activities for students as well as parents. Participants will be able to try out activities that I have used in my Math Escape Room at school.

Presented by: Serena Newburger, Lordstown Elementary School

Grade Levels: 5 - 8 ***Room:*** Olscamp 208

Strand: Teaching and Learning in MATHEMATICS

B4 Elementary STEM Resources for Grades PreK-8

Participants will have the opportunity to explore elementary STEM resources in a hands-on setting and have access to a linked list of over 40 resources. A brief introduction to several elementary STEM resources, including robots, lesson database websites, construction systems, microcontroller, STEM guidebooks, and others for grades PreK-8 will be highlighted. Many of these resources will be available for participants to explore hands-on. A linked list of all the resources will provided as a Dropbox download.

Presented by: Bob Claymier, STEM is Elementary
Terry Claymier, STEM is Elementary

Grade Levels: PreK - 4, 5 - 8 ***Room:*** Olscamp 225

Strand: Teaching and Learning in ENGINEERING

B5 Use of Affordable Infrared Cameras for Inquiry in the Chemistry Classroom

Presentation of best practices for incorporating newly-affordable infrared imaging technology into high-school or undergraduate chemistry courses. Chemists often rely on visually striking color changes shown by indicators to detect or track reactions. IR thermography represents a new class of universal indicators that use false colors to visualize chemical processes. Its applications are numerous as any process that absorbs or releases heat can be visualized. From the change of the temperature pattern of a subject over time, one can infer what is going on behind the thermal scenes. Although IR cameras are not new, inexpensive lightweight models such as the $200 FLIR ONE have become available only recently, paving the road for its large-scale applications in science education. We will present laboratory experiments we have developed based on IR thermography along with curriculum modules based on these experiments that will help educators plan to incorporate this newly-affordable technology into their undergraduate or high school chemistry classrooms.

Presented by: Andrew Torelli, Ithaca College
Alexis Ostrowski, Bowling Green State University
Travis Green, Bowling Green State University

Grade Levels: 9 - 12, College ***Room:*** Olscamp 201

Strand: Integrating Technology in the Classroom

B6 The Great Lakes: A Great Resource to Teach Math & Science

HOMES? What does this acronym mean to you? Do you know if you live in the Great Lakes watershed or not? Come join us to learn some of the basic facts about the Great Lakes. Also learn of available lesson plan resources and classroom activities to incorporate into teaching Ohio math and science standards. Participants will receive copies of the demonstrated lessons and instructions on how to access a wealth of other resources.

Presented by: Marla Miller, Pettisville High School
Donna Meller, Pettisville High School

Grade Levels: 5 - 8, 9 - 12 ***Room:*** Olscamp 113

Strand: STEM in the Community: Thinking Outside the Classroom

A7/ B7 Project Wild/Growing Up Wild

NOTE: THIS SESSION IS FOR BGSU EARLY CHILDHOOD STUDENTS WHO HAVE REGISTERED ONLY. DOUBLE SESSION

Add this great environmental education curriculum to your classroom! Project Wild and Growing up Wild provide teachers with all the resources they need to include wildlife concepts into their lesson plans and way to incorporate science, math, literacy, and language arts. I will be giving a brief overview of what Project Wild is and how it can be used in the classroom. I will then run through a number of activities with the group from the curriculum. Finally, I will wrap up by giving the group information on future education with Project Wild.

Presented by: Meredith Gilbert, ODNR Division of Wildlife

Grade Levels: PreK - 4, 5 - 8, 9 - 12 ***Room:*** Olscamp 203

Strand: Teaching & Learning in Science

B8 Extending Mastery Based Mathematics with Technology

Are you ready for a journey to Mastery Island? Visit this presentation for evidence based practices that catapulted a 3rd grade classroom in urban Toledo toward math mastery. The entire class scored accelerated or higher on the most recent State OST. Also learn how other grades are making tremendous growth by integrating Scratch, Ozobots, Edison Robots and Makey-Makey's to extend students critical thinking skills. In addition to discussing the Mastery Initiative we will model and allow time for participants to engage with these new products and old trusted favorites. We have created centers for participants to travel to for a brief demonstration of each product and how we integrate them into our school.

Presented by: Jack Hunter, Chase STEMM Academy
Brandi Taylor, Chase STEMM Academy

Grade Levels: PreK - 4, 5 - 8 ***Room:*** Olscamp 106

Strand: Teaching and Learning in MATHEMATICS

B9 Teaching About Population and the Environment with Mathematical Models

In this hands-on, interdisciplinary workshop, participants will learn how to effectively use mathematical modeling in the classroom to link math with key topics in the natural sciences and social studies, including timely global challenges like carbon emissions, population growth, and changing ecosystems. Participants will learn how to engage students with hands-on activities that use math modeling in a variety of formats – with manipulatives, technology and in classroom simulations. They will also learn how these activities meet their state and Common Core standards for several different disciplines. The presented activities explore population growth models and probabilistic projections, the creation of cartograms and the use models to illustrate carbon emissions over time.

Presented by: Deb Gallagher, Bowling Green State University

Grade Levels: 5 - 8 ***Room:*** Olscamp 219

Strand: Teaching and Learning in MATHEMATICS

B10 Getting Students to Argue From Evidence

This session will focus on how to implement the Claim-Evidence-Reasoning (CER) model to make scientific explanations. CER is one of the Science Practices found in Ohio's Learning Standards for Science and can also be found in the Social Studies and Language Arts standards. To demonstrate the process, participants will go through the process in the 50 minute session. Participants will be given a set of "Skewed" dice. They will develop a question about the dice and collect the data. Participants will then write a CER for their question. We will then discuss how to use this in class, how to scale it to multiple grade levels, and how to do an argument session. Participants will be provided with websites that have inquiry based activities teachers can implement in their own classrooms.

Presented by: Bob Furlong, Otsego High School

Grade Levels: 5 - 8, 9 - 12, College ***Room:*** Olscamp 221

Strand: Teaching & Learning in SCIENCE

B11 Doing the DESMOS: Bringing STEM into the Classroom and Putting Teachers in the Driver's Seat

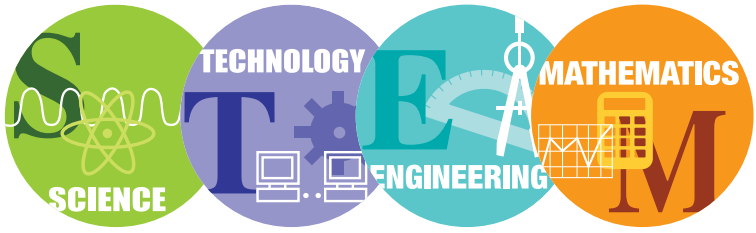
Participants will discover that the FREE Desmos program is more than just a calculator app. Learn how science teachers are using this online, teacher-led program to change the face of STEM in their classrooms...everything from graphing to mastering vocabulary. Personal electronic device is recommended for this hands-on session.

Presented by: Angie McMurry, Arcanum High School/SECO

Grade Levels: 5 - 8, 9 - 12, College

Room: Olscamp 223

Strand: Putting Creativity to Work: Teaching STEM With Innovation



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

BLOCK C: 11:00 - 11:50 A.M.

C1 STEM Projects in "Pure" Mathematics, Grades 7-12

We'll look at some arithmetic, algebra and geometry projects in mathematics itself, not in science, engineering, or technology. We'll see how to scaffold, assess, and even find time for pure math projects that cultivate numeric insight, logical analysis, precise expression, innovation with math tools, and persistence in problem-solving. We'll introduce open-ended student explorations in cryptology, game theory, spatial approximation, and real vs. rational quantity.

Presented by: Peter Lang, Cleveland Metro Schools

Grade Levels: 5 - 8, 9 - 12, College ***Room:*** Olscamp 120

Strand: Teaching and Learning in MATHEMATICS

C2 From Socrates to STEMM

Student centered instruction is a focal point across the contemporary education spectrum. To encourage independent thinking and improve learning, teachers are being challenged to employ student centered instructional styles. This session will include a review of the styles of teaching as categorized by Mosston and apply them to STEMM including examples currently being used to teach anatomy and physiology. Audience members will be asked to actively participate in the session.

Presented by: Frederick Andres, Ph.D., Bowling Green State University
William A. Saltarelli, Ph.D., Bowling Green State Universit

Grade Levels: 9 - 12, College ***Room:*** Olscamp 201

Strand: Putting Creativity to Work: Teaching STEM With Innovation

C3 Soil at Your Fingertips!

Get your fingers dirty! Explore soil by testing it for structure, composition, texture and nutrients. Hands-on, classroom ready labs to help students understand the importance of soil will be addressed. One free soil testing kit will be given away! This workshop is designed to help teachers understand the importance of soil integrity and structure. Teachers will participate in soil structure, composition by volume, texture by feel, and nutrient testing lessons. We will discuss why soil is important for agriculture and how structure, composition and nutrient availability determine the types of commodities that can be grown.

Presented by: Donna Meller, Pettisville High School
Jeff Jostpile, Fort Jennings School

Grade Levels: PreK - 4, 5 - 8, 9 - 12 ***Room:*** Olscamp 208

Strand: STEM in the Community: Thinking Outside the Classroom

C4 Screen Free Coding for K-2 with Bee and Blue Bot

Attend this session and see how coding can be a screen free hands-on experience for young students. Based on Seymour Paperts LOGO, a language designed specifically for young children, the Bee-Bot and Blue-Bot provide hands-on opportunities to code integrated with other key concepts such as distance, direction, and estimation. Attendees will participate in this hands-on session as they use the bots to bring alive concepts through cooperative learning. The bots also provide direct experience with Computational Thinking skills including Decomposition, Abstraction, and Algorithm.

Presented by: Laurie Green, Mrs. Geeky LLC

Grade Levels: PreK - 4 ***Room:*** Olscamp 225

Strand: Integrating Technology in the Classroom

C5 Citizen Scientists Needed for the GLOBE Urban Heat Island Effect Campaign

Dr. Kevin Czajkowski (University of Toledo) is the lead scientist for the GLOBE (www.globe.gov) Urban Heat Island Effect Campaign. The presenters are part of the GLOBE Mission EARTH program funded by NASA to promote GLOBE and NASA resources. Our session will provide teachers with the following:

- How to sign up for this new NASA badge
- Science content on heat islands, cloud formation, Earth's energy budget, and NASA satellites collecting surface temperature data
- Information on GLOBE eTrainings, Clouds Protocol and Surface Temperature Protocol
- GLOBE and NASA classroom activities to teach the science content and protocols
- Alignment to the Ohio Science Standards and NGSS.

Educators will see students working as scientists in the field collecting data and entering it on the GLOBE website. Participants will also learn how to visualize the data using GLOBE and NASA resources. In the end, educators will see the value of their students being citizen scientists.

Presented by: Sara Mierzwiak, University of Toledo

Grade Levels: PreK - 4, 5 - 8, 9 - 12, College, Citizen Scientists ***Room:*** Olscamp 117

Strand: STEM in the Community: Thinking Outside the Classroom

C6 Five E-asy Pieces: Teaching Science to Millennial Learners

We teach science because we love it! It's exciting, it's dynamic, it's relevant. Now, how can we get our millennial students to agree? Understanding how our students are wired gives us an edge. We'll borrow an approach from the constructivist learning theory - "The 5 E's" - to explore how to make our science teaching connect and infect! Brief introduction to the 5E's. Break-outs in pairs/trios for application of 5 E's to science topics. Summary discussion of opportunities and challenges.

Presented by: Christine Boudrie, Lourdes University

Grade Levels: 9 - 12, College ***Room:*** Olscamp 113

Strand: Teaching and Learning in SCIENCE

C7 Using Literacy & Nature of Science to Enhance Science Instruction for Elementary Classrooms

Teaching the Nature of Science (NoS) to young learners helps to break down misconceptions about what science is and who can do science. Purposefully incorporating children's books is one way to address these topics in a meaningful and powerful way. During this workshop, participants will learn why the NoS is important, and how to design NoS lessons/units that support content. Participants will also select appropriate children's books to teach NoS & content. Activities, a book list, and suggestions will be provided.

Presented by: Davida Pantuso, Kent State University

Grade Levels: PreK - 4 ***Room:*** Olscamp 203

Strand: Teaching and Learning in SCIENCE

C8 Ecology and Citizen Science in the Elementary and Middle School Classroom

Share Alert! - Find out how to get your students outside learning about ecology on your own school grounds and how to share what you find with scientists! Project PRAIRIE, is a partnership between the Toledo Zoo, Wild Toledo, Perrysburg , Maumee and Toledo Public Schools. An urban prairie was installed on each of the partner schools' grounds by Wild Toledo. Since installment last year, hundreds of students have been outside learning about plants, animals, ecology and conservation all while doing citizen science! Find out how you can too!

Presented by: Amy Boros, Perrysurg Schools/Hull Prairie Intermediate
Mike Dick, Maumee City Schools/Gateway Middle

Grade Levels: 5 - 8 ***Room:*** Olscamp 106

Strand: Putting Creativity to Work: Teaching STEM With Innovation

C9 Mighty Microgreens. Grow, Eat, Learn!

Microgreens are 2 to 4 inch baby vegetables such as broccoli, pea shoots, sunflower shoots, and radish. Mighty microgreens are highly nutritious and delicious. They can be organically grown in a classroom under regular light within 10 - 12 days in very small growing containers. Children learn basic life science concepts including traits of living things, the needs of living things, interactions within habitats, life cycles, and growth, behavior, and changes. They also experience first hand healthy eating and how to grow foods locally and organically. All participants will plant and take home a microgreen kit and gain information regarding affordable options for beginning a microgreen program at their school. Your classroom could grow, sell, and provide healthy vegetables for your school.

Presented by: Jodi Haney, Maumee Greens & Xcite Learning

Grade Levels: PreK - 4 ***Room:*** Olscamp 219

Strand: Teaching and Learning in SCIENCE

C10 Math in the Real World - Linking the Classroom and Professional Land Surveying

This session will examine resources available to math teachers provided by the Professional Land Surveyors of Ohio. Several opportunities to assist teachers with integrating career development information and real-world experiences into classroom scenarios will be outlined. Presenters will discuss several initiatives by the organization to provide educational resources for math teachers that encourage students to consider a career in the land surveying profession.

Presented by: Patrick Leonhardt, P.S., Professional Land Surveyors of Ohio, Inc
David Andrus, P.S., Professional Land Surveyors of Ohio, Inc
Terry Wright, P.S., P.E., Professional Land Surveyors of Ohio, Inc

Grade Levels: 5 - 8, 9 - 12 ***Room:*** Olscamp 221

Strand: Teaching and Learning in MATHEMATICS

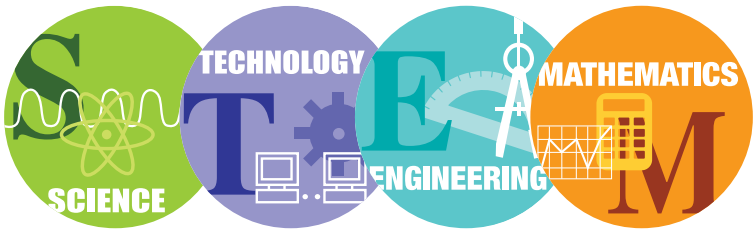
C11 NASA Engineering Design Challenge

Learn about the engineering design process and participate in a NASA Engineering Design Challenge. Participants will learn about the engineering design process and how to access NASA's free educational resources, including engineering design challenges for grades K-8. Participants will work in teams to complete a NASA engineering design challenge. The activities are aligned with the Ohio's New Learning Standards: Technological and Engineering Designs grade K-8 and fosters 21st Century Skills.

Presented by: Kristy DiSalle, Springfield Local Schools, Dorr Elementary
Kristen Quigley, Springfield Local Schools, Dorr Elementary

Grade Levels: PreK - 4, 5 - 8 ***Room:*** Olscamp OLSC 223

Strand: Teaching and Learning in ENGINEERING



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

BLOCK D: 1:45 - 2:35 P.M.

D1 Introduction to Programming with Ozobots

Participants will be introduced to ozobots and encouraged to explore them to come up with any noticings and wonderings. Participants will experience two challenges that they could use in K-8 settings to introduce students to coding with ozobots. Major ideas include the importance of being precise and of problem solving, in addition to ideas of inputs, outputs, and loops. Time will be given to discuss practical implications of using these in a classroom setting.

Presented by: Thomas Roberts, Bowling Green State University

Grade Levels: PreK - 4, 5 - 8 ***Room:*** Olscamp 120

Strand: Integrating Technology in the Classroom

D2 Get with the Program

New to coding? Overwhelmed with requests to help students with programming? This session will take those who have never coded before through a simple approach to learning the foundations of all computer languages. Free resources using familiar technology will help your students AND teachers Get With The Program! We will be using TI graphing technology and Innovator Hubs to introduce coding. These are common resources in the math classroom in the majority of high schools today.

Presented by: Michelle Grooms, Texas Instruments

Grade Levels: 5 - 8, 9 - 12, College ***Room:*** Olscamp 201

Strand: Integrating Technology in the Classroom

D3 Making Inferences During Science: The SMARTTIS Project

Citizens' outcry for higher academic achievement among students have resulted in legislative mandates calling for more frequent testing including standardized assessments beginning in elementary school. One test, the National Assessment of Educational Progress (NAEP) is the nation's only continuous assessment and survey of what students know and how they perform in various content area subjects such as science.

This presentation discusses the science-literacy teaching practices of one teacher as she engaged her students in studying variation and relatedness in living organisms. More specifically, it shares detailed moment-by-moment examples of several lessons showing how the scientific understanding of fourth graders can be increased when the teacher encourages students to generate inferences during science lessons. This session will include research, practice, and audience participation; we will also share recently published curriculum regarding this cognitive process.

Presented by: Vanessa Morrison, Adrian College
Andrea Milner, Adrian College

Grade Levels: PreK - 4 ***Room:*** Olscamp 208

Strand: Putting Teaching and Learning in SCIENCE

D4 Robotics, Coding, and Programming, OH MY!

There are so many resources for Robotics, Coding, and Programming, it can be overwhelming. Join us as we share the plethora of resources and help you find the ones that are right for you!

Presented by: Bob Claymier, STEM is Elementary
Laurie Green, Mrs. Geeky

Grade Levels: PreK - 4 ***Room:*** Olscamp 225

Strand: Putting Creativity to Work: Teaching STEM With Innovation

D5 Nutrition, STEM, and You: Exploring Math Trails at the Supermarket

A math trail is an activity that encourages students to explore their environment to discover and notice mathematics around them. In this interactive presentation, we share a Math Trail for middle and secondary level students constructed at a local supermarket. Our activity engages students on data analysis and interpretation of graphs through the study of food prices and nutritional content/labels. We'll distribute a variety of links to articles and sample math trails during the session. Audience members will leave with a number of classroom-ready resources and activities to use with their students.

Presented by: Michael Todd Edwards, Miami University
Zac States, Miami University

Grade Levels: 5 - 8, 9 - 12 ***Room:*** Olscamp 117

Strand:Teaching and Learning in MATHEMATICS

D6 Use of Affordable Infrared Cameras for Inquiry in the Chemistry Classroom

Presentation of best practices for incorporating newly-affordable infrared imaging technology into high-school or undergraduate chemistry courses. Chemists often rely on visually striking color changes shown by indicators to detect or track reactions. IR thermography represents a new class of universal indicators that use false colors to visualize chemical processes. Its applications are numerous as any process that absorbs or releases heat can be visualized. From the change of the temperature pattern of a subject over time, one can infer what is going on behind the thermal scenes. Although IR cameras are not new, inexpensive lightweight models such as the $200 FLIR ONE have become available only recently, paving the road for its large-scale applications in science education. We will present laboratory experiments we have developed based on IR thermography along with curriculum modules based on these experiments that will help educators plan to incorporate this newly-affordable technology into their undergraduate or high school chemistry classrooms.

Presented by: Andrew Torelli, Ithaca College
Alexis Ostrowski, Bowling Green State University
Travis Green, Bowling Green State University

Grade Levels: 9 - 12, College ***Room:*** Olscamp 113

Strand: Integrating Technology in the Classroom

D7 H2Know: Water Quality Issues in the Western Lake Erie Basin

Attend this session to see a new digital case study on water quality in the Western Lake Erie Basin, available from Nutrients for Life and GrowNextGen.org. Activities will be modeled and portions of the two-day case study will be highlighted. Participants who attend will get an overview of the water quality curriculum entitled H2Know. Video excerpts and activities will be shared to help highlight the physical, chemical and environmental contributors to harmful algal blooms (HABs). One online activity, related to run-off from farm fields, will be tried out within the session. Teachers will be able to use the free curriculum in their classrooms to help students understand HABs and why they affect the Western Lake Erie Basin and tools to evaluate the solutions that have been proposed for addressing the issue

Presented by: Katrina Swinehart, Central State University/GrowNextGen.org

Grade Levels: 9 - 12, College ***Room:*** Olscamp 203

Strand: STEM in the Community: Thinking Outside the Classroom

D8 Learning About the World Inside Your Classroom

By using Virtual Reality (VR) the amount of places you can take your students to is unlimited. Learn how to incorporate Google Expeditions VR software into your classroom to take your students on field trips around the world! Participants will have the opportunity to use the VR headsets and explore the many different areas Google Expeditions has to offer.

Presented by: Elliott Lawrence, Ohio State University Extension

Grade Levels: 5 - 8, 9 - 12 ***Room:*** Olscamp 106

Strand: Integrating Technology in the Classroom

D9 Expanding the SCOPE of Science Education

The SCOPE Program offers students the unique opportunity to gain hands-on experience with one of two state-of-the-art microscopes directly from their classroom. It is a free program available to any interested schools. We will connect to the SEM at the University of Toledo to show first-hand how the program works in a classroom. From the presentation, the SEM will be able to be used just as any researcher on campus would use it, outside of physically loading the samples.

Presented by: Cassandra Zamora, University of Toledo SCOPE Program
Kristin Kirschbaum, University of Toledo SCOPE Program

Grade Levels: 5 - 8, 9 - 12 ***Room:*** Olscamp 219

Strand: Integrating Technology in the Classroom

D10 Are your students curious? Are you curious?

Curiosity is squelched early on. Without it, STEM education will suffer. I will discuss research with sparking and maintaining students' curiosity.

Presented by: Ray Heitger, Bowling Green State University

Grade Levels: 5 - 8, 9 - 12, College ***Room:*** Olscamp 221

Strand: Putting Creativity to Work: Teaching STEM With Innovation

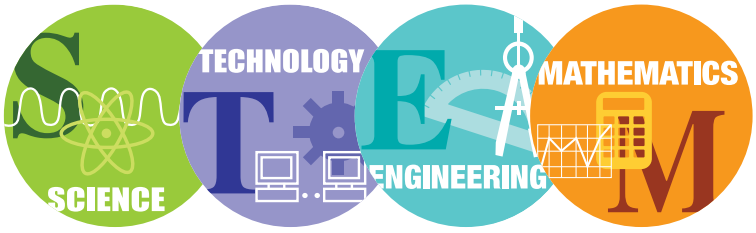
D11 Virtual Field Trips to the Zoo

In this session we will explore how classrooms can be enhanced by using technology to virtually connect students with the zoo. We will use "Zoom" (a free video-conferencing service) to virtually connect back to the zoo to see animals on exhibit and speak with staff at the zoo. We will discuss how using both live and pre-recorded videos from community partners can be used to enhance STEM learning as well as facilitate hands-on activities that involve using STEM skills to engage with the virtual field-trip.

Presented by: Alexandra Burris, The Toledo Zoo

Grade Levels: PreK - 4, 5 - 8, 9 - 12 ***Room:*** Olscamp 223

Strand: STEM in the Community: Thinking Outside the Classroom

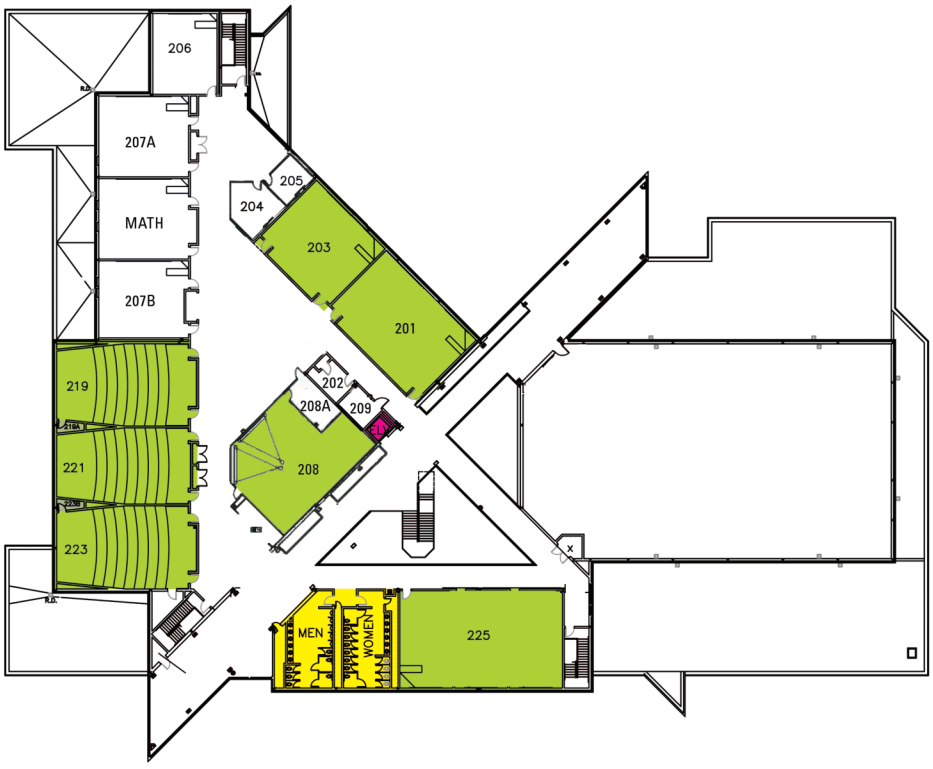


Northwest Ohio Symposium on Science, Technology, Engineering, and Mathematics Teaching

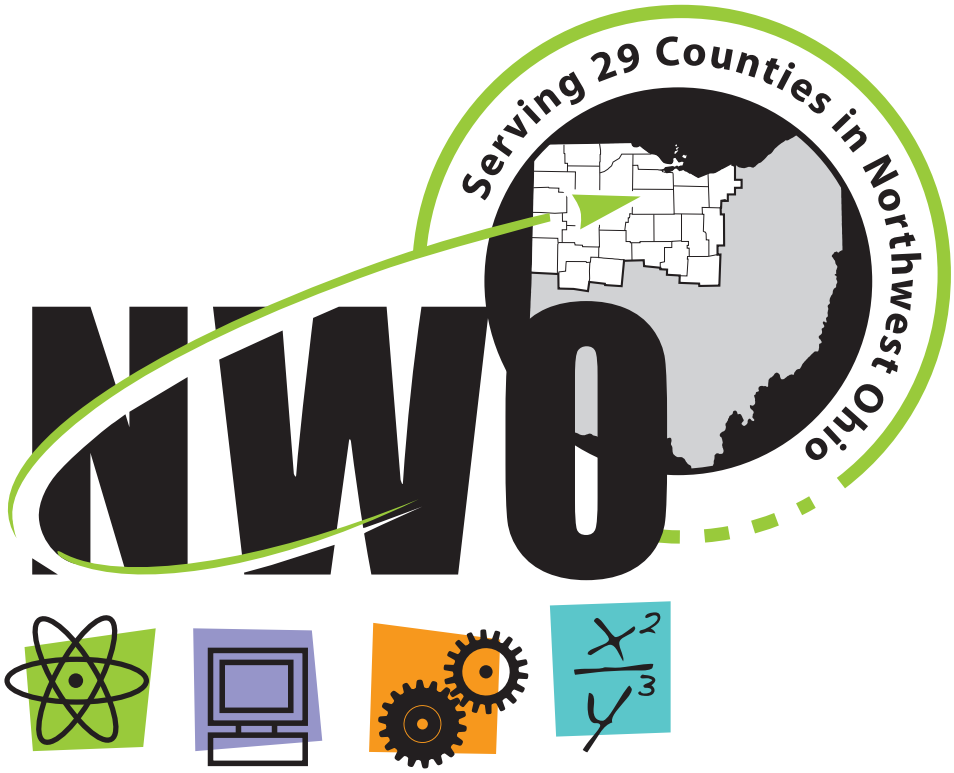
OLSCAMP HALL MAP - FIRST FLOOR

Rooms
Elevator
Restrooms

OLSCAMP HALL MAP - SECOND FLOOR



Rooms
Elevator
Restrooms



Northwest Ohio Center for Excellence in STEM Education

The NWO Symposium on Science, Technology, Engineering, and Mathematics Teaching is sponsored by the Northwest Ohio Center for Excellence in STEM Education and its partners around northwest Ohio.

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