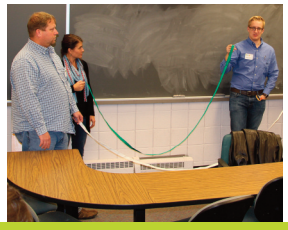
2015
NWO Symposium









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

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

Saturday, November 21, 2015

8:30 am - 4:00 pm

Olscamp Hall
Bowling Green State University

www.nwocenter.org/nwoSymposium

Sponsored in part by

NWO Northwest Ohio Center for Excellence in STEM Education

BGSU

The Andersons

Welcome

We are pleased to welcome you to the Northwest Ohio Symposium on Science, Technology, Engineering, and Mathematics (STEM) Teaching. This event offers a valuable opportunity for educators to share and learn from one another in our common effort to advance (STEM) education for people of all ages.

Last year over 270 people attended this event, including in-service and pre-service teachers, higher education faculty, and business and community partners participating in more than 70 sessions.

This year, we are offering 59 informative and engaging sessions, and are thrilled to have as our keynote speaker Dr. Daniel Brahier, BGSU Professor of Teaching Excellence (more on Dr. Brahier on pg. 4).

We hope you find the 2015 Northwest Ohio Symposium on STEM Teaching to be a beneficial experience, especially those of you who are here for the first time. With your help, we will continue to make this symposium the premier STEM professional development opportunity for educators in northwest Ohio.

Thank you for joining us!

NWO
Northwest Ohio Center for Excellence in STEM Education

COSMOS
Center Of excellence in Science and Mathematics education: Opportunities for Success

BGSU

SCIENCE TECHNOLOGY ENGINEERING MATHEMATICS
Northwest Ohio Symposium on Science, Technology, Engineering, and Mathematics Teaching

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

Conference Agenda

7:30 – 8:30 AM . . . . . Registration (Outside Olscamp Hall: Room 101)

8:00 – 9:45 AM . . . . . Breakfast (Olscamp Hall: Room 101)

8:30 – 9:45 AM . . . . . Welcome and Keynote Address

10:00 – 10:50 AM . . . . . Block A

11:00 – 11:50 AM . . . . . Block B

11:50 AM – 12:40 PM . . . Lunch

12:50 – 1:40 PM . . . . . Block C

1:50 – 2:40 PM . . . . . Block D

2:50 – 3:40 PM . . . . . Block E

NWO Symposium Evaluation

Please complete an evaluation sheet for each session you attend. (The sheets are in the manila envelope you received at registration.) Everyone who returns a completed set of evaluation sheets at the end of the day will be entered in a raffle for a $25 Amazon.com gift card!

Also, please complete the online evaluation for the 2015 Symposium. All who complete the survey will be entered into a drawing for a $25 Amazon.com gift card.

The online evaluation can be found at:
tinyurl.com/NWOSymposium

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.

Keynote Presentation

Dr. Daniel Brahier
BGSU Professor of Teaching Excellence

Science and Mathematics for a New Generation

A passionate and dedicated educator for 35 years, Dr. Brahier continues to have a tremendous impact on mathematics education nationwide. He has written several books, including the top-selling textbook for middle and high school mathematics teacher preparation. He is also the co-author of *Principles to Actions*, an NCTM-published guidebook centered on mastering teaching practices with core principles for today's educators. Dr. Brahier has spent much of the last year traveling around the country speaking about *Principles to Actions* and where mathematics education is headed.

Dr. Brahier has taught mathematics and science at many levels during his career. He currently teaches mathematics education courses at BGSU, and Honors 8th Grade Mathematics at St. Rose Catholic School in Perrysburg, OH. Dr. Brahier also serves as the BGSU Director of Science and Math Education in ACTION, a scholarship program designed to prepare STEM teachers in current and effective teaching and research methods.

Over the course of his career, he has been a mathematics and earth science teacher, high school principal, and regional curriculum coordinator. He was also instrumental in re-writing BGSU's mathematics education curriculum and Ohio's model curriculum for mathematics. He has received funding from the National Science Foundation, the Ohio Board of Regents, and the National Council of Teachers of Mathematics to conduct research on improving the teaching of mathematics in schools. Dr. Brahier enjoys working on the local, state, national, and international levels to improve mathematics teaching and learning and has most recently worked with the Ministry of Education in Jamaica to reform the entire country's approach to mathematics education.

Dr. Brahier's passion for teaching math and for preparing the next generation of math teachers has earned him the title of **2015-2018 Professor of Teaching Excellence**, designated for BGSU faculty members who hold the rank of full professor and whose extraordinary achievements as effective teachers in their discipline or in interdisciplinary fields deserve special recognition. His BGSU students appreciate his devotion and named him a 2001 Master Teacher, praising him as a transformative teacher who shows great care for his students. He has more than fulfilled the early promise he showed as the first winner of BGSU's Outstanding Young Scholar Award. He has received the highest state award for math teaching excellence and was the recipient of a second top state teaching award.

Dr. Brahier's keynote presentation – "***Science and Mathematics for a New Generation***" – will focus on the use of research-based teaching practices in classrooms of today and the future. He will explore the role that critical thinking plays in the STEM classroom and how all educators need to work toward the same goals.

Session Overview

OLSC = Olscamp Hall

BA = Business Administration Building

Welcome & Keynote: 8:30-9:45 AM	Keynote Address: Dr. Daniel Brahier (Olscamp Hall: Room 101)						
Room #	**OLSC 117**	**OLSC 219**	**OLSC 223**	**BA 101**	**BA 103**	**BA 110**	**BA 112**
Block A: 10:00-10:50 AM	College Classroom A1	Engineering A2	Science A3	A4 Integrating Technology	A5 Mathematics	Science A6	STEM in the Community A7
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Lunch: 11:50 AM - 12:40 PM							
Block C: 12:50-1:40 PM	College Classroom C1	STEM in the Community C2	Putting Creativity to Work: C3	Science C4	Engineering C5	Mathematics C6	Mathematics C7
Block D: 1:50-2:40 PM	D1 Putting Creativity to Work:	College Classroom D2	Putting Creativity to Work: D3	Science D4	Science D5	D6 Mathematics	Mathematics D7
Block E: 2:50-3:40 PM	E1		Putting Creativity to Work: E2	Science E3	STEM in the Community E4	E6	

Room #	**BA 114**	**BA 115**	**BA 117**	**BA 1000**	**BA 1002**	**BA 1007**
Block A: 10:00-10:50 AM	Mathematics A8	Mathematics A9	Putting Creativity to Work: A10	Science A11	A12 Engineering	
Block B: 11:00-11:50 AM	Mathematics B8	Mathematics B9	Mathematics B10	Integrating Technology B11	B12	Putting Creativity to Work: B13
Lunch: 11:50 AM - 12:40 PM						
Block C: 12:50-1:40 PM	Mathematics C8	Mathematics C9	Mathematics C10	Integrating Technology C11	Mathematics C12	Mathematics C13
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Block E: 2:50-3:40 PM		Mathematics E5	Mathematics E7	Integrating Technology E8		

2015 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.

Research Based Instructional Practices in the College Classroom: Enhancing the Undergraduate Experience
Inquiry-based teaching practices and active learning strategies are often difficult to implement in the high-enrollment courses that make up much of the early undergraduate experience. These difficulties, however, are not insurmountable. Sessions in this strand will demonstrate how inquiry can effectively be implemented in undergraduate STEM courses, especially those that are high-enrollment.

Block A: 10:00 - 10:50 AM

A1 Work Smarter, Not Harder: Tools, Tips, and Techniques to Help Students become more Focused, Organized, and Productive

Efficient and effective time management is especially important for college students whose schedules are largely self-directed. While the flexibility afforded to students promotes autonomy and responsibility, it can inadvertently lead to divided focus and unproductive behaviors. There are myriad resources, mostly from the field of business, that address efficiency techniques. This presentation will focus on applying these established, practical techniques to the workflow of college students.

Presented by: Jerry Schnepp, Bowling Green State University
Mary-Jon Ludy, Bowling Green State University

Grade Levels: 9 - 12, College ***Room:*** OLSC 117

Strand: Research Based Instructional Practices in the College Classroom: Enhancing the Undergraduate Experience

A2 Elementary STEM Resources for Grades K-6

Over 20 elementary free or inexpensive STEM resources, including collections of lessons, construction systems, inexpensive programmable robots, engineering educator websites, and other materials will be presented in a hands-on display. Resources can be integrated into the Ohio or NGSS standards. A checklist and hot links webpage will given to all attendees.

Presented by: Bob Claymier, STEM is Elementary

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

Strand: Teaching and Learning in ENGINEERING

A3 Simulations and Computational Thinking to Teach Scientific Practices

Simulations should never replace regular laboratory experiences, but should be an integral part of every science classroom. Simulations can help teach the importance of a controlled experiment, and how to analyze a variety of data. Additionally, hundreds of experiments can be run in a single class period. Now that is inquiry!

The complex, elegant systems and cycles that make up the human body and the natural world are fascinating. Using lectures, blackboard diagrams, or even animations to explain those systems and cycles can make them incomprehensible and, well, boring. That's why I use simulations to teach Scientific Practices. I will demonstrate free, cloud-based computational simulations that allow students to manipulate variables using sliders, and run their experiments. Teachers will participate in whiteboarding, student-led investigations, and role-playing with simulations. These techniques have transformed my students ability to analyze data and use data to drive decisions. Teachers in this session will participate in hypothesis testing, and learn how to easily implement simulations into their classrooms today.

Presented by: Jon Darkow, Seneca East High School

Grade Levels: 9 - 12, College ***Room:*** OLSC 223

Strand: Teaching and Learning in SCIENCE

Block A: 10:00 – 10:50 AM continued

A4/B4 Improving Mathematics Instruction & Assessment Through Technology

(Double Session from 10:00 - 11:50 AM)

In this interactive presentation participants will explore innovative ways technology can be utilized in the mathematics classroom. Participants will learn how to engage students through the use of various google applications as well as other educational web 2.0 tools. Be sure to bring a computer or other device in order to be an active participant learning how to use these tools both as an educator and student. At the end of the presentation, participants will leave with templates to utilize in the classroom.

Presented by: Stephanie Buckenmeyer, Anthony Wayne Junior High School
Sarah Keane, Anthony Wayne Junior High School

Grade Levels: 5 - 8, 9 - 12 ***Room:*** BA 101

Strand: Integrating Technology in the Classroom

A5/B5 Rich Experiences that Bring Math Alive! (Double Session from 10:00 - 11:50 AM)

Two challenges teachers most often face are motivating students to want to learn and differentiating instruction so that students really learn. In 4 simple steps, learn how to engage students in learning and meet individual student needs by using rich math tasks, problems and questions. Increase motivation and achievement with a "minds-on" approach to teaching and learning. Teach more concepts in less time to all levels of students with one lesson!

Presented by: Jonily Zupancic, Minds On Math

Grade Levels: PreK - 4, 5 - 8 ***Room:*** BA 103

Strand: Teaching and Learning in MATHEMATICS

A6 Oak Openings Region Ecosystem as the Material for Elementary Level Instruction: Use Your Native Environment to Teach Science

We will present a 4th-grade level lesson from newly developed lesson plans using place-based education. "Great Oaks of Fire" introduces the abrupt changes some natural environments undergo in the event of fire. Oak's natural resistance to fire is a key idea. An activity points to the different tolerances plants in a mixed forest have to wildfire heat. We will study tree ring evidence as clues to earlier environmental events, and learn about how oak bark has special properties. Participants will prepare tree cookies representing their own lives.

Presented by: Janet Traub, Green Ribbon Alliance
Lindsey Reinarz, The Nature Conservancy
Erika Buri, Olander Park System

Grade Levels: PreK - 4 ***Room:*** BA 110

Strand: Teaching and Learning in SCIENCE

Block A: 10:00 – 10:50 AM continued

A7 History Einstein: How Historical Sites can enhance your STEM curriculum

For decades, history museums have employed hands-on learning in the form of demonstrations and activities such as butter making, gardening and old fashioned game playing. These very same activities can also engage your students in STEM subjects in new and creative ways. This presentation will help you see your next field trip in a new light. You'll get insights and concrete projects to take with you that will help you incorporate STEM into your social studies and history lessons and create memorable experiences for your students.

Presented by: Andi Erbskorn, Sylvania Historical Village

Grade Levels: 5 - 8 ***Room:*** BA 112

Strand: STEM in the Community: Thinking Outside the Classroom

A8 Earth by the Numbers

In this STEM-based workshop, participants will engage in innovative, hands-on activities to help students use their developing math skills to better understand human impacts on the environment. Use real-world data to boost understanding of numbers and operations, measurement, probability and more. Receive lesson plans on CD-ROM.

Presented by: Debra Gallagher, Bowling Green State University

Grade Levels: 5 - 8 ***Room:*** BA 114

Strand: Teaching and Learning in MATHEMATICS

A9 How do I find enough TIME to teach all the math standards??

This quick, hands-on activity will allow you to prioritize your time more efficiently and teach math more effectively. Teachers will be surprised to find out that they can spend a week (or more) PER STANDARD in regards to their "major standards". Teachers will leave with a color-coded document to alleviate the stress from the recurring question "how do I get it all covered?" and will also gain an understanding of how their standards align vertically with other grade levels.

Presented by: Gary Herman, Putnam County Educational Service Center

Grade Levels: PreK - 4, 5 - 8, 9 - 12 ***Room:*** BA 115

Strand: Teaching and Learning in MATHEMATICS

Block A: 10:00 – 10:50 AM continued

A10 Tried Geocaching in the Classroom? It's Simple, Innovative, Engaging, Easy to Implement, Transforming, Fun & Educational

Geocaching is a real-world, outdoor treasure hunting game using GPS-enabled devices. Participants navigate to a specific set of GPS coordinates and then attempt to find the geocache (container) hidden at that location. Educaching transforms geocaching in education. The presenters will explain the two concepts and work through two of the award winning Educaching GPS/STEM lessons. They will highlight some of the benefits of the instructional method related to teaching science and math in the wonderful outdoors.

Presented by: Bob Rumschlag, SDG Creations, Ltd
Kate Hubbard, SDG Creations, Ltd

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

Strand: Putting Creativity to Work: Teaching STEM With Innovation

A11 GMO Answers

Teach students the science through lab activities. Come to transform bacteria to glow in UV light. This presentation will cover basics of genetic transformation, gene insertion and help to clarify misconceptions about GMO's. This activity is part of a two-day workshop offered in the summer by Feed the World Program.

Presented by: Heather Bryan, Education Projects and Partnerships
Jane Hunt, Education Projects and Partnerships

Grade Levels: 9 - 12, College ***Room:*** BA 1000

Strand: Teaching and Learning in SCIENCE

A12/ B12 3-2-1 BLAST OFF! (Double Session from 10:00 - 11:50 AM)

It's easy; it's fun, and it's guaranteed to be a hit with your students. During this session, we will use NASA's "Rocket Guide" to design, build, and launch high-flying paper rockets. Bring your coat because we will launch the rockets outside. I will also share my ideas and experiences for successfully implementing this engaging, hands-on STEM activity in the classroom. This presentation will support instruction in engineering processes, the scientific concepts of projectile motion, and applications for trigonometry.

Presented by: James Less, Lake High School

Grade Levels: 5 - 8, 9 - 12 ***Room:*** BA 1002

Strand: Teaching and Learning in ENGINEERING

Block B: 11:00 - 11:50 AM

B1 Promoting Virulence Gene Expression in Phytophthora Sojae

Promoting virulence gene expression by removing selective pressure in favor of an environment where virulence genes are warranted.

Presented by: Rachel Wilson, Bowling Green State University

Grade Levels: College ***Room:*** OLSC 117

Strand: Research Based Instructional Practices in the College Classroom: Enhancing the Undergraduate Experience

B2 STEM Opportunities with Metroparks

Nature provides us with numerous opportunities to engage students in the STEM fields. However, there is an ever-growing disconnect in our society to natural areas. Nature cannot only help develop STEM thinking in students, but STEM can also help students to view these natural areas in a new light and value the importance of conserving these areas. Take away activities to use in your classroom, and inspire your students to go outside.

Presented by: Rachel Hefflinger, Metroparks of the Toledo Area
Katherine Clement, Metroparks of the Toledo Area
Lauren Broddrick, Metroparks of the Toledo Area

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

Strand: STEM in the Community: Thinking Outside the Classroom

B3 Touchable Animals as a Hook to Learning (Limited to 20 Participants)

Animals can be used in a multitude of ways to promote inquiry and interdisciplinary learning in the classroom. Come watch as we demonstrate lessons that use animals to engage students, help them overcome common fears and misconceptions, and develop an appreciation of life in all forms.

Presented by: Christine Knaggs, Lourdes University
Ashley Breakfield, Lourdes University

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

Strand: Teaching and Learning in SCIENCE

B6 Water Quality: Clearly an Important Issue

Teaching students about the science behind hazardous algae blooms is critical. What contributes to this problem and how can it be addressed? In this session participants will perform water quality tests, use data to show the development of cultural eutrophication and discover what factors are important to water quality.

Presented by: Jane Hunt, Education Projects and Partnerships
Heather Bryan, Education Projects and Partnerships

Grade Levels: 5 - 8, 9 - 12 ***Room:*** BA 110

Strand: Teaching and Learning in SCIENCE

Block B: 11:00 – 11:50 AM continued

B7 Fostering Mathematical Proficiency through Problem Solving: Sharing Grade 6 Lessons, Successes, and Challenges

During this session teachers will share lessons they developed to help their students gain greater mathematically proficiency. Over the past year, we have participated in the $(C)^2A(M)^2P$ grant (Common Core for Achievement and Middle Grades Mathematical Proficiency) and collaborated on designing and enacting lessons in grade-level teams crossing school districts. We will share these lessons that support students' problem solving and proficiency, and discuss successes and challenges with a focus on promoting mathematical proficiency through problem solving.

Presented by: $(C)^2A(M)^2P$ Teacher Participants

Grade Levels: 6 ***Room:*** BA 112

Strand: Teaching and Learning in MATHEMATICS

B8 Fostering Mathematical Proficiency through Problem Solving: Sharing Grade 8 Lessons, Successes, and Challenges

During this session teachers will share lessons they developed to help their students gain greater mathematically proficiency. Over the past year, we have participated in the $(C)^2A(M)^2P$ grant (Common Core for Achievement and Middle Grades Mathematical Proficiency) and collaborated on designing and enacting lessons in grade-level teams crossing school districts. We will share these lessons that support students' problem solving and proficiency, and discuss successes and challenges with a focus on promoting mathematical proficiency through problem solving.

Presented by: $(C)^2A(M)^2P$ Teacher Participants

Grade Levels: 8 ***Room:*** BA 114

Strand: Teaching and Learning in MATHEMATICS

B9 Helping students become mathematically proficient: Sharing Grade K Lessons

During this session teachers will share lessons they have developed and shared to help their students become mathematically proficient thinkers. Over the past year we have been participating in the $(CO)^2MP$ grant (Common Core for Mathematical Proficiency). We will share our lessons, materials, and student learning and growth that has resulted from a focus on making students mathematically proficient.

Presented by: $(CO)^2MP$ Teacher Participants

Grade Levels: K ***Room:*** BA 115

Strand: Teaching and Learning in MATHEMATICS

Block B: 11:00 – 11:50 AM continued

B10 Helping students become mathematically proficient: Sharing Grade 3 Lessons

During this session teachers will share lessons they have developed and shared to help their students become mathematically proficient thinkers. Over the past year we have been participating in the $(CO)^2MP$ grant (Common Core for Mathematical Proficiency). We will share our lessons, materials, and student learning and growth that has resulted from a focus on making students mathematically proficient.

Presented by: $(CO)^2MP$ Teacher Participants

Grade Levels: 3 ***Room:*** BA 117

Strand: Teaching and Learning in MATHEMATICS

B11 Building Success for Every Learner: Integrating technology into everyday learning to ensure access for all

The focus of this session will be on how strong instructional supports through the use of technology can build success for all learners. Participants will have the opportunity to review a lesson in light of embedded technology supports, interact with lesson review rubrics and supporting tools, and examine a redesign process that will provide quality universal lesson design for diverse learners.

Presented by: Brenda Gift, ESC of Lake Erie West

Grade Levels: PreK - 4, 5 - 8, 9 - 12 ***Room:*** BA 1000

Strand: Integrating Technology in the Classroom

B13 STEM Behind Hollywood and STEM Behind Health – Outstanding Activities for Grades 7 – 12 Math and Science

Teach and engage students with STEM practices and concepts using math and science activities about Zombies, Space, Forensics, Superheroes, and Diabetes Research. Experience these activities first-hand and see how to easily obtain them for FREE along with the student worksheets and teacher notes and solutions. Texas Instruments combined energies of the National Academy of Sciences, the Science and Entertainment Exchange, and Sandford Health to create these STEM reality–based activities. "Combining math and science in interactive, hands-on simulations is an exciting way to show how these disciplines are used in the real world." – Dr. Kurt Griffin, Director of Clinical Trials

Presented by: Tom Reardon, Youngstown State University/Fitch High School

Grade Levels: 5 - 8, 9 - 12, College ***Room:*** BA 1007

Strand: Putting Creativity to Work: Teaching STEM With Innovation

Block C: 12:50 - 1:40 PM

C1 Student Research Projects Related to the Intersection between Chemistry and Art

(Limited to 15 Participants)

This presentation will describe various student group projects including the analysis and synthesis of pigments, salt formations on ancient ceramics, off-gassing from materials used in museum display cases, investigation of fresco chemicals, and reproduction of a classic work of art.

Presented by: Elizabeth Wise, Lourdes University

Grade Levels: 9 - 12, College ***Room:*** OLSC 117

Strand: Research Based Instructional Practices in the College Classroom: Enhancing the Undergraduate Experience

C2 Ag + Sci = STEM: Discovering the Science of Agriculture

Discover the science of agriculture and instantly integrate STEM activities into your classroom. Developing methods to make STEM relevant to every day can easily begin with helping students understand where their food comes from. Agriculture encompasses many aspects of science and learning to include lessons and activities that promote an understanding of STEM in agriculture will help youth understand the challenges we face globally in creating a sustainable world that makes sure all people get enough to eat. Lesson ideas and activities will be shared with participants on how to incorporate agriculture as STEM in their classroom throughout the year. Also ideas will be shared on how to work collaboratively with a high school agricultural department and other community resources.

Presented by: Donna Meller, Pettisville High School

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

Strand: STEM in the Community: Thinking Outside the Classroom

C3 A Framework for Integrated STEM: Grades K-2

We will discuss a framework which integrates K–2 STEM Problem-Based Learning with the NGSS and CCSS. With our session participants, we will conduct an activity from a portion of a project that is developmentally appropriate for grade 2. Handouts will be available.

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

Grade Levels: PreK - 4 ***Room:*** OLSC 223

Strand: Putting Creativity to Work: Teaching STEM With Innovation

Block C: 12:50 – 1:40 PM continued

C4 Universal Design for Learning (UDL): Creating a Learning Environment that Challenges and Engages All Learners

UDL provides multiple and flexible methods of presentation, expression and engagement. An overview of UDL, methods and strategies for implementation, and two teachers use of UDL will be discussed.

Presented by: Amy Biggs, Buckeye United School District
Lynn Shoemaker, Mount Vernon Nazarene University
Tamie Shiplett, Indian River High School

Grade Level: 5 - 8, 9 - 12 ***Room:*** BA 101

Strand: Teaching and Learning in SCIENCE

C5 Launch Your Students' Future Today with this Engineering Design Process Program!

Future City is a cross-cultural program that lets students in the 6th, 7th, and 8th grades do the things engineers do: identify problems, brainstorm ideas, design solutions, test and retest, build and then share the results.

Presented by: Debbie Morgan, Future City Competition
Carolyn Watkins, Future City Competition

Grade Levels: 6-8 ***Room:*** Room: BA 103

Strand: Teaching and Learning in ENGINEERING

C6 The Key to Retention in Math: Emporium Model in High School

In order to create a student-centered environment that could accommodate learners of various mathematics background and ability levels, mastery-based STEM high school piloted Emporium Model in its Algebra I courses. Students in the Emporium Model class used mathematical learning platform Assessment and Learning in Knowledge Spaces (ALEKS) to learn, apply, and demonstrate their mastery of algebraic concepts. Teachers in this course assumed a role of an encourager, guide, and just-in time tutor. We will share the experiences of both teacher and students, as well as student achievement and retention of Algebra I concepts after completing this class.

Presented by: Sandra Wilder, Bio-Med Science Academy, NEOMED

Grade Levels: 9 - 12 ***Room:*** Room: BA 110

Strand: Teaching and Learning in MATHEMATICS

Block C: 12:50 – 1:40 PM continued

C7 Fostering Mathematical Proficiency through Problem Solving: Sharing Grade 6 Lessons, Successes, and Challenges

During this session teachers will share lessons they developed to help their students gain greater mathematically proficiency. Over the past year, we have participated in the $(C)^2A(M)^2P$ grant (Common Core for Achievement and Middle Grades Mathematical Proficiency) and collaborated on designing and enacting lessons in grade-level teams crossing school districts. We will share these lessons that support students' problem solving and proficiency, and discuss successes and challenges with a focus on promoting mathematical proficiency through problem solving.

Presented by: $(C)^2A(M)^2P$ Teacher Participants

Grade Levels: 6 ***Room:*** BA 112

Strand: Teaching and Learning in MATHEMATICS

C8 Fostering Mathematical Proficiency through Problem Solving: Sharing Grade 7 Lessons, Successes, and Challenges

During this session teachers will share lessons they developed to help their students gain greater mathematically proficiency. Over the past year, we have participated in the $(C)^2A(M)^2P$ grant (Common Core for Achievement and Middle Grades Mathematical Proficiency) and collaborated on designing and enacting lessons in grade-level teams crossing school districts. We will share these lessons that support students' problem solving and proficiency, and discuss successes and challenges with a focus on promoting mathematical proficiency through problem solving.

Presented by: $(C)^2A(M)^2P$ Teacher Participants

Grade Levels: 7 ***Room:*** BA 114

Strand: Teaching and Learning in MATHEMATICS

C9 Helping students become mathematically proficient: Sharing Grade 1 Lessons

During this session teachers will share lessons they have developed and shared to help their students become mathematically proficient thinkers. Over the past year we have been participating in the $(CO)^2MP$ grant (Common Core for Mathematical Proficiency). We will share our lessons, materials, and student learning and growth that has resulted from a focus on making students mathematically proficient.

Presented by: $(CO)^2MP$ Teacher Participants

Grade Level: 1 ***Room:*** BA 115

Strand: Teaching and Learning in MATHEMATICS

Block C: 12:50 – 1:40 PM continued

C10 Helping students become mathematically proficient: Sharing Grade 4/5 Lessons

During this session teachers will share lessons they have developed and shared to help their students become mathematically proficient thinkers. Over the past year we have been participating in the (CO)^{2}MP grant (Common Core for Mathematical Proficiency). We will share our lessons, materials, and student learning and growth that has resulted from a focus on making students mathematically proficient.

Presented by: (CO)2MP Teacher Participants

Grade Level: 4/5 ***Room:*** BA 117

Strand: Teaching and Learning in MATHEMATICS

C11 Flipping Your Classroom

You will explore and discuss what a flipped classroom is, brainstorm potentials of the flipped teaching and also identify key challenges that must be addressed in a flipped learning environment. Because audio and video-based materials play a significant role in a flipped classroom, you will also gain insights and be introduced to a variety of tools to create flipped learning content. This presentation will get you up and running with knowledge and skills you need to flip your own classroom.

Presented by: Lan Li, Bowling Green State University
Anca Nicoleta Birzescu, Bowling Green State University

Grade Level: 5 - 8, 9 - 12, College ***Room:*** BA 100

Strand: Integrating Technology in the Classroom

C12 Math on the Move! Focus on Number

Bring your coat and come prepared to move! I will share ways that upper elementary to early high school students can learn mathematics through movement. Topics will focus on calculations with integers and include the order of operations. This session should also help participants learn to critique ways that certain model-movements may support or interfere with student learning of any mathematics topic. Handouts provided!

Presented by: Julie Nurnberger-Haag, Kent State University

Grade Levels: 5 - 8, 9 - 12 ***Room:*** BA 100

Strand: Teaching and Learning in MATHEMATICS

C13 Black Swamp Math Teachers' Circle

Black Swamp Math Teachers' Circle is one of the newest MTC in Ohio. The summer immersion was held in 2015. Come see some of the exciting mathematics that the teachers experienced in the summer and learn more about this new group. Find out how you can join us for the fall and spring meetings.

Presented by: Debra Gallagher, Bowling Green State University
Joan Funk, Notre Dame Academy
Marcia Miller, Notre Dame Academy

Grade Levels: 5 - 8, 9 - 12, College ***Room:*** BA 1007

Strand: Teaching and Learning in MATHEMATICS

Block D: 1:50 - 2:40 PM

D1/E1 Limited Facts: A pedagogy for teaching students the concepts, problem solving, and complex calculations of arithmetic, fractions, and algebra. (Double Session from 1:50 - 3:40 PM)

This session focuses on helping teachers restructure their math or science class so that all children can succeed. The session will include a focus on introducing the results of various teacher action research projects; teaching the concepts of addition using solely the "limited facts" of: zero plus anything, anything plus one, 5+5, 1+9, 9+1, 7+7, 7+8, and 8+8; how the same system of teaching limited facts can be adapted for teaching subtraction, multiplication, and division; and how "limited facts" improves the teaching algebra and chemistry for students who don't know their basic arithmetic facts.

Even if you teach early childhood, you may find it useful to see that teaching algebra and chemistry should be the reason "why" to teach early childhood.

Presented by: Richard Oldrieve, Cleveland State University

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

Strand: Putting Creativity to Work: Teaching STEM With Innovation

D2 Beyond Clickers - the Next Generation of Classroom Response Systems is here

Making large classes more interactive: LectureTools allows students to use any type of mobile device, including flip phones, to answer questions during class. Questions are no longer limited to MC questions; you can use short answer, numerical, and image questions as well. Students afraid to ask questions can now send them to the instructor during class, and get answers either during or after class per the instructor's preference. Participants will login and use LectureTools during a short lesson. Tips for creating presentations in LectureTools will be shared at the end of the presentation.

Presented by: Edith Preciosa Kippenhan, The University of Toledo

Grade Levels: College ***Room:*** OLSC 219

Strand: Research Based Instructional Practices in the College Classroom: Enhancing the Undergraduate Experience

D3 Energetic Engineers! STEM based activities for preschoolers (Limited to 20 Participants)

This presentation will demonstrate how to plan engineering projects for preschoolers using favorite children's picture books.

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

Grade Levels: PreK - 4 ***Room:*** OLSC 223

Strand: Putting Creativity to Work: Teaching STEM With Innovation

Block D: 1:50 – 2:40 PM continued

D4 Project WET Sampler (Water Education for Teachers)

On "The Incredible Journey," students simulate the movement of water molecules within the water cycle. "Ask the Bugs" simulates bioassessment of a stream, the way that Ohio EPA collects macroinvertebrates as indicators of good or poor water quality. Participants will (1) walk through these two activities; (2) receive copies of seven hands-on activities from the new Project WET 2.0 guide, including "Blue Planet," "Seeing Watersheds," and "On Track with Hydration;" and (3) receive samples of successful OEEF mini grants for science supplies.

Presented by: Carolyn Watkins, Ohio EPA Office of Environmental Education
Jeff Montavon, Ohio EPA Office of Environmental Education

Grade Levels: 5 - 8 ***Room:*** BA 101

Strand: Teaching and Learning in SCIENCE

D5 Build-a-Bin: Wiggle your way into worm composting (Limited to 20 Participants)

Let worms turn your trash into growing treasure and learn the science of vermiculture! Worm composting is an exciting and interactive way for students to learn about decomposers, composting, and soil health while meeting standards in science, math, and literacy. The build-a-bin program offered through the Toledo Botanical Garden engages participants in scientific inquiry and observation as they learn the preferences of worms through experimentation. Participants engage in math and engineering as they build a bin to meet these preferences. A classroom worm bin and in-class presentation will be raffled off to participants who attend!

Presented by: Tiffany Jenkins, Toledo Botanical Garden

Grade Levels: PreK - 4, 5 - 8 ***Room:*** BA 103

Strand: Teaching and Learning in SCIENCE

D6/E6 Pushing the Boundaries of Formative Assessment in Mathematics

(Double Session from 1:50 - 3:40 PM)

The success of students relies on teachers' ability to evaluate prior knowledge, identify the misconceptions, and modify instruction while teaching and learning are still occurring. The goal of a fairly new type of formative assessment, called MAP Classroom Challenge, is to support mathematics teachers in effectively accomplishing this in their classrooms. During this presentation we will provide detailed descriptions of this teaching and assessment strategy and how it can be successfully implemented in your classroom. Finally we will demonstrate the positive impact a particular Classroom Challenge had on revealing and subsequently eliminating student misconceptions related to certain fundamental algebraic concepts in an Algebra 2 class in a STEM high school.

Presented by: Sandra Wilder, Bio-Med Science Academy, NEOMED

Grade Levels: 5 - 8, 9 - 12 ***Room:*** BA 110

Strand: Teaching and Learning in MATHEMATICS

Block D: 1:50 – 2:40 PM continued

D7 Fostering Mathematical Proficiency through Problem Solving: Sharing Grade 7 Lessons, Successes, and Challenges

During this session teachers will share lessons they developed to help their students gain greater mathematically proficiency. Over the past year, we have participated in the $(C)^2A(M)^2P$ grant (Common Core for Achievement and Middle Grades Mathematical Proficiency) and collaborated on designing and enacting lessons in grade-level teams crossing school districts. We will share these lessons that support students' problem solving and proficiency, and discuss successes and challenges with a focus on promoting mathematical proficiency through problem solving.

Presented by: $(C)^2A(M)^2P$ Teacher Participants

Grade Level: 7 ***Room:*** BA 112

Strand: Teaching and Learning in MATHEMATICS

D8 Fostering Mathematical Proficiency through Problem Solving: Sharing Grade 8 Lessons, Successes, and Challenges

During this session teachers will share lessons they developed to help their students gain greater mathematically proficiency. Over the past year, we have participated in the $(C)^2A(M)^2P$ grant (Common Core for Achievement and Middle Grades Mathematical Proficiency) and collaborated on designing and enacting lessons in grade-level teams crossing school districts. We will share these lessons that support students' problem solving and proficiency, and discuss successes and challenges with a focus on promoting mathematical proficiency through problem solving.

Presented by: $(C)^2A(M)^2P$ Teacher Participants

Grade Level: 8 ***Room:*** BA 114

Strand: Teaching and Learning in MATHEMATICS

D9 Helping students become mathematically proficient: Sharing Grade 2 Lessons

During this session teachers will share lessons they have developed and shared to help their students become mathematically proficient thinkers. Over the past year we have been participating in the $(CO)^2MP$ grant (Common Core for Mathematical Proficiency). We will share our lessons, materials, and student learning and growth that has resulted from a focus on making students mathematically proficient.

Presented by: $(CO)^2MP$ Teacher Participants

Grade Level: 2 ***Room:*** BA 115

Strand: Teaching and Learning in MATHEMATICS

Block D: 1:50 – 2:40 PM continued

D10 Computer Science Math Electives for All High School Students

Computer science is a uniquely relevant immersion in science, technology, engineering and math. You can offer this exposure to all high school students, not just AP Java heads, via one-semester math electives in computer programming. From Hello World, to elementary cryptology, to winning at tic-tac-toe, to Turing Machines and CPU architecture, necessary programming platforms are already classroom-deployed with MS-Office. Come see curricula and assessments for up to three semesters of high school computer science prior to AP Java.

Presented by: Peter Lang, Cleveland Metro Schools

Grade Level: 9 - 12 ***Room:*** BA 117

Strand: Teaching and Learning in MATHEMATICS

D11 Getting more out of animations: Going beyond the content

Animations are a powerful tool for helping students visualize objects, events, and interactions that are too small, large, fast, slow, or otherwise difficult to observe directly. They can help students learn difficult scientific concepts, but the benefits are limited if they are just passively watching the animation. This session will provide some practical strategies to get students to be more active and engaged in the viewing of animations. This will allow them to extract more meaningful information from animations as well as develop important lifelong learning skills. Most examples given are from a college Introductory Biology course, but the strategies can easily be applied to other science courses at the high school or college level.

Presented by: Justin Pruneski, Heidelberg University

Grade Levels: 9 - 12, College ***Room:*** BA 1000

Strand: Integrating Technology in the Classroom

D12 There IS a Challenger Learning Center near YOU!

The Challenger Learning Center of Lake Erie West provides students with unique real-world learning experiences, transforming them into scientists, engineers, or researchers on simulated space missions. Come and learn about our new missions and programs.

Presented by: Janet Struble, Challenger Learning Center – ESC of Lake Erie West

Grade Levels: PreK - 4, 5 - 8, 9 - 12 ***Room:*** BA 1002

Strand: STEM in the Community: Thinking Outside the Classroom

D13 Our Water Story: A Cross-Curricular Approach to Global Water Conservation

Every living thing on planet earth is connected through one common need: access to clean water. What is your connection to water? This session will engage geographic literacy, inquiry and story telling to provide a multi-disciplinary approach to teach your students the science behind water.

Presented by: Laura Schetter, Wildwood Environmental Academy & Jodi Haney, Xcite Learning

Grade Levels: 4-6 ***Room:*** BA 1007

Strand: STEM in the Community: Thinking Outside the Classroom

Block E: 2:50 - 3:40 PM

E2 Making Standards-Based Grading Work For You

Standards-based grading is becoming more prevalent in education. From authors like Robert Marzano to blogs from teachers like Frank Noschese, there is a lot of information to sift through and break down. This session breaks down the ideology behind the standards-based grading and provides tips for how to implement it in a classroom. Presented by teachers who have taken the plunge and made the change in their own classrooms, this session shows what standards-based grading looks like in real classrooms at different levels and gives suggestions about what it could look like in your classroom, as well as the challenges you may encounter along the way.

Presented by: Tom Stewart, Oregon City Schools
Lauren Stewart, Sylvania City Schools

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

Strand: Putting Creativity to Work: Teaching STEM With Innovation

E3 Exercise Science: Exercise as Medicine

A lack of physical activity/exercise is thought to be a better predictor of premature death than smoking. Many look to medications to restore wellness but overlook physical activity. Medicine is usually taken according to a prescribed formula and the same is true for exercise. The presenters will discuss the science of exercise in developing wellness and preventing and treating chronic disease, as well as how exercise prescribed using the FITT-VP principle.

Presented by: Frederick Andres, Bowling Green State University
Todd Keylock, Bowling Green State University

Grade Levels: 5 - 8, 9 - 12, College ***Room:*** BA 101

Strand: Teaching and Learning in SCIENCE

E4 It's a Zoo Out There - The Zoo, Inquiry, and Your Class (Limited to 15 Participants)

Explore the integration of inquiry lessons and live animals during Zoo visits with an emphasis on hands on learning. Activities for at the Zoo and in your classroom will be the main focus.

Presented by: Josh Minor, Toledo Zoo

Grade Levels: PreK - 4, 5 - 8, 9 - 12 ***Room:*** BA 103

Strand: STEM in the Community: Thinking Outside the Classroom

E5 An Exploratory Aproach to Proportional Reasoning

An ability to reason using proportional relationships is a complex process that develops over an extended period of time. The activities and explorations, shared during this session, will provide the conceptual background and skill development to deal with proportional relationships in a variety of settings.

Presented by: Oxana Grinevich, Lourdes University

Grade Levels: 5 - 8 ***Room:*** BA 115

Strand: Teaching and Learning in MATHEMATICS

Block E: 2:50 – 3:40 PM continued

E7 Using GeoGebra and Problem-Based Learning to Enhance Geometrical Understanding

This session explores a classic treasure hunt problem through GeoGebra. Participants will be engaged as problem solvers, so please bring your technology (laptops). The focus of the discussion will be on the role of problem solving in the mathematics classroom and how activities such as this connect to the mathematics standards and mathematical practices. Furthermore, we will discuss strategies in addition to the role of problem solving and technology for engaging all students in their mathematics learning.

Presented by: Tod Shockey, The University of Toledo
Sekhar Pindiprolu, The University of Toledo

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

Strand: Teaching and Learning in MATHEMATICS

E8 2D and 3D GeoGebra Constructions of the Conics

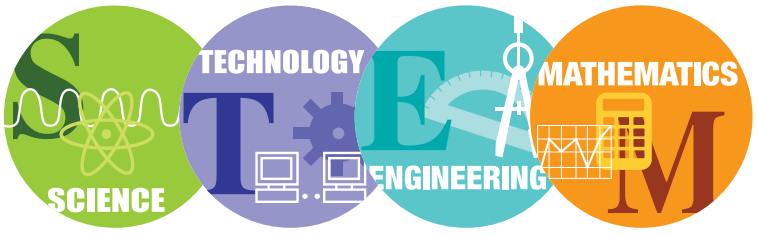
In this talk we present several 2D and 3D GeoGebra applets for studying the conics (ellipse, parabola, and hyperbola). We show how cutting an infinite cone with a plane generates all three conics depending on the slope of the plane. The other definitions of the conics, based on their characteristic properties are also presented and discussed. These properties use the distance from a point to the focci and directrix, or use the eccentricity of the curve. All constructions are made with GeoGebra applets. Several GeoGebra demonstrations of the reflective properties of the conics are also shown.

GeoGebra is a free multi-platform software for learning and teaching mathematics. It is available for desktops, and mobile devices. The participants will be able to work with the applets on their own electronic devices.

Presented by: Irina Boyadzhiev, The Ohio State Univeresity – Lima

Grade Level: 9 - 12, College ***Room:*** BA 1000

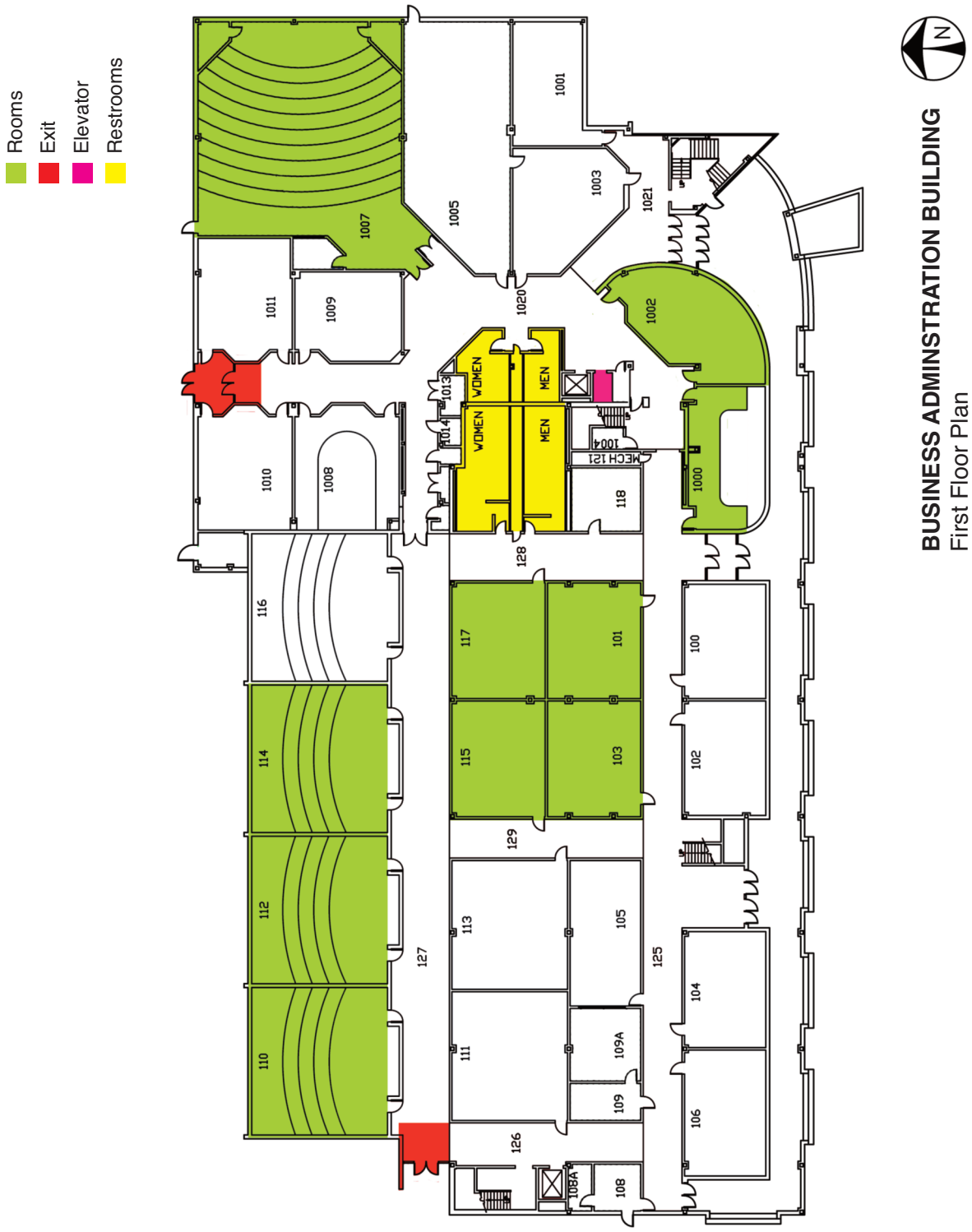
Strand: Integrating Technology in the Classroom



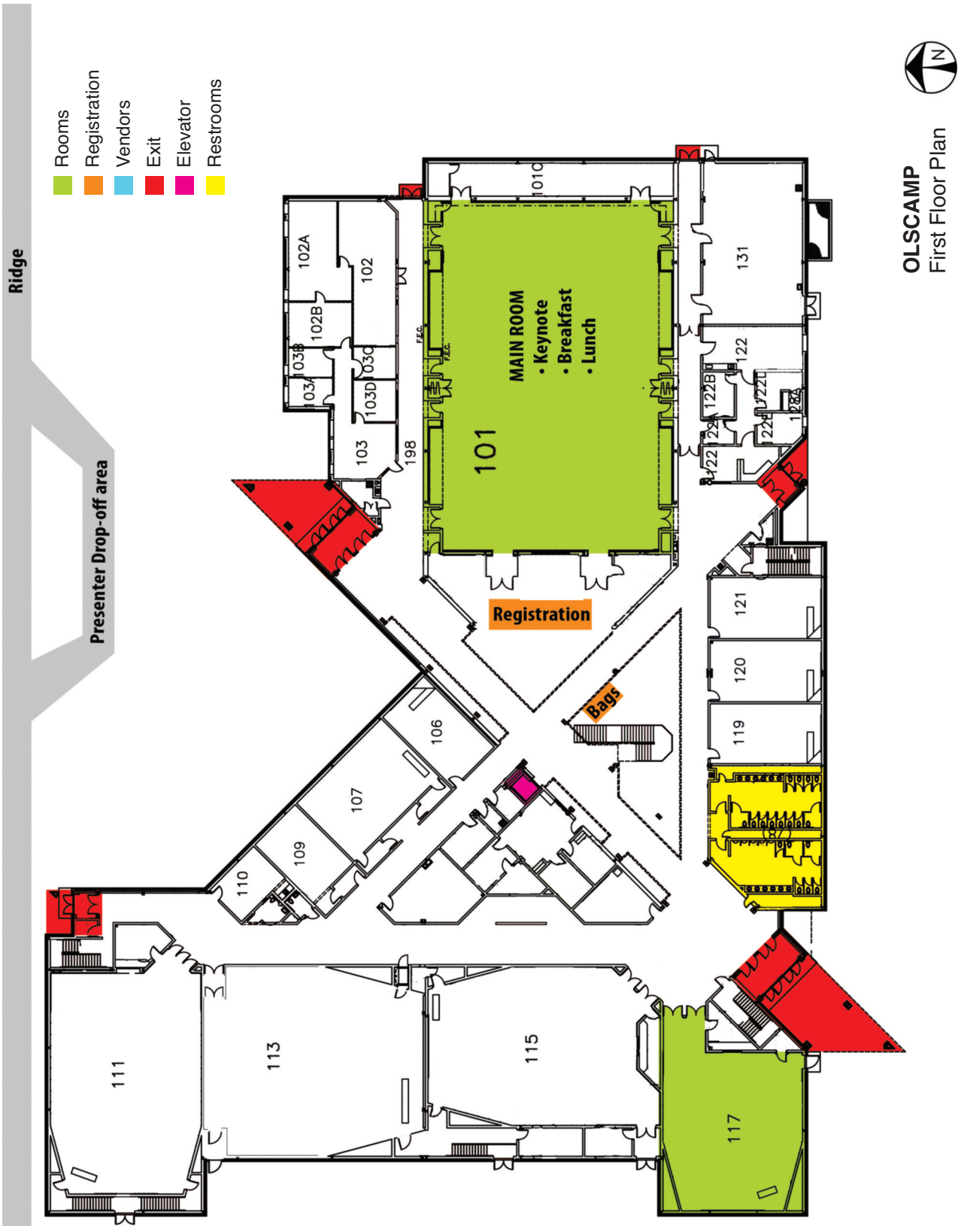
Northwest Ohio Symposium on Science, Technology, Engineering, and Mathematics Teaching

Notes

Business Administration Building Map



Olscamp Hall Map - first floor



Olscamp Hall Map - second floor

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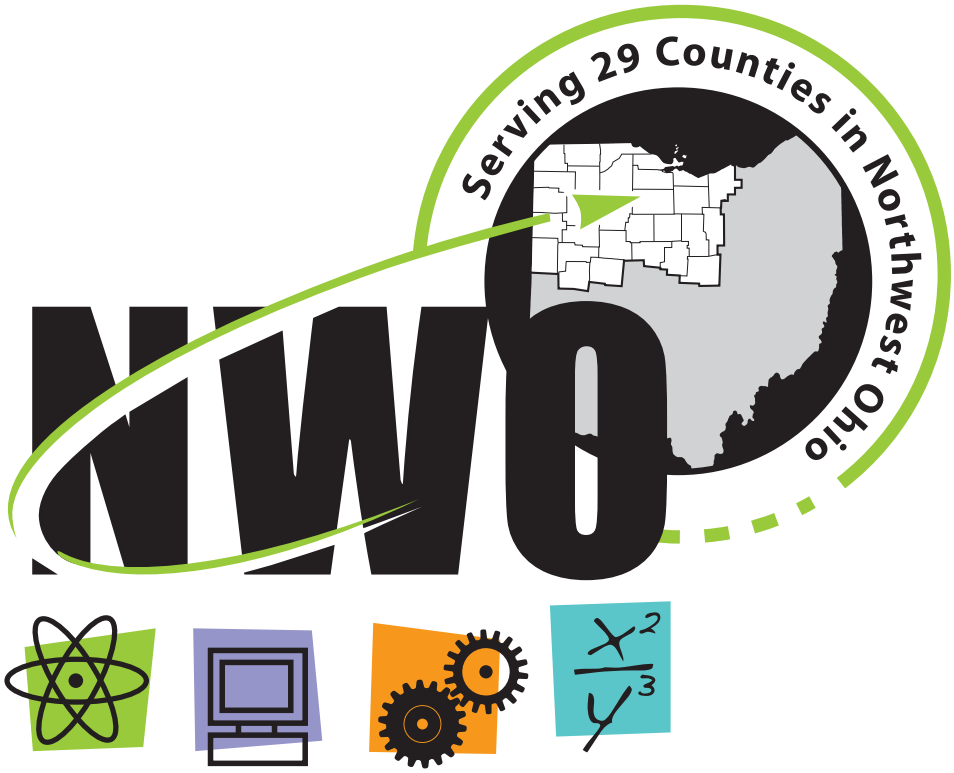

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