Seventh Annual

Appalachian Ohio

Mathematics and Science Teaching

Research Symposium

The Incalculable Value of STEM

Saturday, September 24, 2016
8:30 a.m.–3:00 p.m.
Morton Hall Second Floor
Ohio University, Athens
AppO MaSTRS 7 Program

8:30 Symposium Registration (second floor foyer, south side)

9:00 Welcome (237)
Howard Dewald, Associate Provost, Ohio University

9:10 Introduction of Keynote Speaker (237)
Courtney Koestler, OCEMS Director, Ohio University

9:15 Keynote Presentation: Teaching Mathematics to Empower, Not to Constrain (237)
Kim Yoak, Executive Director, Ohio Council of Teachers of Mathematics

For too long, too many students and adults have felt beaten down as a result of negative or limiting experiences in mathematics classes. Achievement in traditional school mathematics has often been used as a measure of one’s potential for success in many other aspects of life. These patterns must be drastically altered, and we as a professional community can take specific steps toward this goal.

10:00 Break

10:10 Green Schools in America (115)
Ryan Mack and Linda Rogness, Muskingum University, 20 min

Some schools in America have made the transition to a green operation. Mack and Rogness will present examples of green schools, how schools can go green, and why schools (as well as other buildings) should make the transition.

10:10 Multi-Intelligences, UDL, and Differentiated Instruction Applied to Mathematics and Science (126)
Julio Camacho, North Central University, 50 min

The students will learn how to develop basic and advanced mathematical computational and procedural skills, reasoning, critical thinking, predicting, evaluating, concluding, and solving problems, acquiring skills involving cognitive, abstract and
conceptual information from several sources such as visual, auditory, kinesthetic, and tactile learning modalities or styles through multi-intelligences, universal design for learning (UDL), and differentiated instruction. These scaffolding strategies and instructional techniques will be used to move students progressively toward stronger understanding, and ultimately, greater learning success.

10:10  

*It's Debatable! Using Socioscientific Issues to Develop Science Literacy* (127)  
**Sami Kahn**, Ohio University, 50 min  
During this interactive workshop, participants will model the use of controversial societal issues related to science to develop their students' scientific literacy. Participants will receive an NGSS-aligned lesson plan, rubrics, and other supporting materials.

10:10  

*Modular Arithmetic* (215)  
**Megan Crabbs**, Ohio University, 20 min  
Attendees will learn about modular arithmetic and how it can be used in the high school classroom.

10:10  

*A Statistics Simulation for Many Different Students* (219)  
**Alex Blohm**, Franklin Heights High School, 50 min  
We will be using manipulatives and the Rossman/Chance web applet to build statistics conceptions and to decide if a lady can smell Parkinson's disease. This simulation can be used in all math classes from seventh grade math up through AP Statistics.

10:10  

*The Math League Math Circle—Come Observe It in Action* (322)  
**Bob Klein and Rebin Muhammad**, Ohio University, 90 min  
This session runs from 10:10–11:40 a.m. and is an opportunity for people to observe how a student math circle operates. We will introduce students to the game of Spot It! and develop the mathematics and mathematical questions underlying the game. We invite observers to witness what goes on and see how mathematical discourse arises from the low-floor, high-ceiling tasks.
10:35  Learning To Be a Warm and Fuzzy Science Teacher (115)
Linda Rogness, Muskingum University, 30 min
Values based behavior goals and a technique called Plan B makes for better communication, better discipline, and a more student-friendly classroom in any content area but especially in these notoriously goal-oriented, daunting-content courses.

10:35  Math Book Groups for Parents, Families, and Teachers: How to Get Started (215)
Courtney Koestler, Ohio University, 20 min
This session will describe how successful books groups with parents, families, and teachers have been designed and implemented. We will talk about specific books that make great book group books.

11:00  Break

11:10  The Tri-State STEM+M Academy (115)
Jayshree Shah and Alicia Spears, Tri-State STEM+M Academy, 30 min
Tri-State STEM+M Academy is a new public high school that will open in the fall of 2017. This academy is open to all students in Ohio, West Virginia, and Kentucky. The school will focus on medical pathways for area students, however other STEM-focused pathways will be offered also. Shah and Spears will talk about the need for a STEM+M school in Southern Ohio and how a STEM school is different from a traditional public school.

11:10  What Is Spatial Thinking, and Why Is It Important for STEM? (126)
Greg Foley, Ohio University, 30 min
Spatial thinking is crucial in art, science, mathematics, engineering, and everyday life. Spatial skills are linked to success in STEM fields. More fundamentally, spatial thinking is essential for the survival of any mobile species. The talk will examine spatial thinking from multiple perspectives.
11:10  *A Place-Based Environmental Approach to Elementary Education* (127)
**Danielle Dani**, Ohio University, 30 min
Dani will make a case for a place-based environmental education approach to elementary science teaching, learning, and teacher education using standards and research findings. Participants will engage in an application activity that can be used in elementary classrooms.

11:10  *Go Fish in the Interactive Classroom* (215)
**Kathryn Wilson**, Muskingum University, 30 min
The common card game, Go Fish, can be applied to various math topics through all levels of education to broaden and deepen understanding with manipulatives.

11:10  *How Do College Practitioners of Modeling Conceptualize the Modeling Process?* (219)
**Ahmad Alhammouri²**, Ohio University, 30 min
In this presentation, Alhammouri shares his findings from interviewing college practitioners of modeling about the modeling process. Next, he compares their perspectives versus mathematics educators’ perspectives regarding this process in secondary education.

11:40  Lunch and Conversations (pick up boxed lunch in foyer)
**Ohio Council of Teachers of Mathematics Gathering** (126)
**Science Education Council of Ohio Gathering** (127)
**Woodrow Wilson Teaching Fellows Gathering** (215)
**CAT & Noyce Scholars Gathering** (219)

12:45  Break

12:55  *Interactive? Let’s Get Active* (126)
**Megan Thornhill²**, Fairfield Senior High School, 50 min
Time flies in this hands-on, minds-on session as you learn how interactive notebooks can help your instruction of, and student retention of, academic vocabulary and concepts. Leave with a mini-comp book constructed on site filled with ideas ready to use on the first day of school!
12:55 *The Do’s and Don’ts When Teaching Evolution* (127)  
**Austin Hook-Anderson**, Muskingum University, 20 min  
Evolution can be a touchy topic. Hook-Anderson will present the good and the bad ways for teachers to introduce it in class.

12:55 *Empowering Students to Become Mathematical Practitioners* (215)  
**Kate Meier**, Dunbar Early College High School, 20 min  
The changing landscape of mathematical content and mathematical practice standards requires a shift in classroom instruction and assessment. This presentation will include specific strategies to help teachers make that shift.

12:55 *Using Photovoice to Assess Student Interest & Learning* (219)  
**Marc Behrendt**, Ohio University, 20 min  
Behrendt describes Photovoice methodology. The talk will focus on informal experiences and assessment of interest and learning during an informal learning activity through the use of photovoice. Imagine having evidence that will help support requests for repeat field trips.

12:55 *Math Circles: For Kids and Teachers* (322)  
**Nick Pilewski**, Ohio University, **Courtney Koestler**, Ohio University, **Scott Hall-Jones**, East Elementary, and **Ryan Davis**, Southern (Meigs) High School, 50 min  
Join the SouthEast Ohio Math Teachers’ Circle for a discussion of the morning’s Math Circle session, Math Teachers’ Circles, and how Math Teachers’ Circle professional development has supported their work in the classroom.

**Elizabeth Agyeman**, Ohio University, 30 min  
The phenomenology of social justice in teacher education studies spans the broad areas of teaching and learning. This includes curriculum, assessment, and instruction in teacher education. The objective of this presentation is to provide a rationale or need for studying a particular issue or problem while using modeling.
1:20  *Modern Technology in the Mathematics Classroom* (215)

**Chris Constable**, Ohio University, 30 min

Constable discusses pedagogy techniques for the math classroom. This includes different mathematical supplements, social networking, and different activities.

1:20  *The Job Interview with a Calculus Teaching Demonstration* (219)

**Zhijun Yin**, University of Akron Wayne College, 30 min

Yin’s presentation is based on experience interviewing for a mathematics teaching position in 2016 and will help graduate students understand the job market in higher education. Yin will provide resources for job hunters.

1:45  Break

1:55  Introduction of Keynote Speaker (237)

**Danielle Dani**, Science Education, Ohio University

2:00  Keynote Presentation: *Making Science Curriculum Come Alive!* (237)

**Leigh Crites**, Morrison-Gordon Elementary School, 45 min

Leigh will discuss how she makes textbook content understandable and memorable for her students.

2:45  Closing Remarks (237)

**Greg Foley**, CAT Program Director, Ohio University

3:00  Farewell

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1 Choose Appalachian Teaching (CAT) scholar
2 Woodrow Wilson Teaching Fellow
3 Ohio University PhD student
About AppO MaSTRS

The purpose of the Appalachian Ohio Mathematics and Science Teaching Research Symposium (AppO MaSTRS) is to strengthen mathematics and science teaching throughout southern and eastern Ohio by fostering relationships among pre-service and in-service teachers and university and college faculty.

AppO MaSTRS 7 is sponsored by the Gladys W. and David H. Patton College of Education; the Ohio Center for Equity in Mathematics and Science (OCEMS); the Southeast Ohio Teacher Development Collaboration (SEOTDC); the Ohio University Woodrow Wilson Teaching Fellowship program; and the Choose Appalachian Teaching (CAT) scholarship program, which partners with Marietta College, Muskingum University, Shawnee State University, and the University of Rio Grande. Additional support was provided by the Ohio University Departments of Mathematics and Teacher Education as well as the Patton College Associate Deans for Research and Outreach.

The research symposium team wishes to thank the speakers, the volunteers, and the participants, especially the CAT scholars and the Woodrow Wilson Teaching Fellows. We also wish to express our appreciation to the Choose Ohio First Scholarship Program administered by the Ohio Department of Higher Education, which funds the CAT Scholarship Program; the National Science Foundation, which funded the Noyce Scholarship Program; and the Woodrow Wilson National Fellowship Foundation.

Help us improve next year’s eighth annual symposium by completing an evaluation survey, available at the registration table during the lunch hour. You may leave your completed survey on the registration table.