Fifth Annual

Appalachian Ohio
Mathematics and Science Teaching

Research Symposium

STEM for One, STEM for All!

Saturday, September 20, 2014
8:30 a.m.–3:00 p.m.
Morton Hall 237
Ohio University, Athens
Program

8:30  **Symposium Registration** (2nd floor foyer)

9:00  **Welcome** (237)
Jeff Connor, SEOCEMS Co-Director
Courtney Koestler, SEOCEMS Director

9:10  **Opening Remarks** (237)
John Henning, Associate Dean of the Patton College

9:25  **Introduction of Keynote Speaker** (237)
Jeff Connor, SEOCEMS Co-Director

9:30  **Keynote: Enduring Understanding for All** (237)
Nina Sudnick, Mathematics Coach, Athens City West Elementary, 45 min
How can we create enduring mathematical understanding for all students? One mathematics educator will share her ongoing journey in pursuit of solutions to this question. She invites you to join the “conversation for possibility” about creating rich mathematical discourse that produces enduring understanding for all.

10:15  **Break**

10:25  **Panel Discussion: Co-Teaching**, 30 min (237)
Gregory Foley, Moderator and CAT Program Director
Panelists:
  Kevin Dael, Mathematics, Alexander High School
  Keith Palmer, Science, Vinton High School
  Rex Payne1, Science, Vinton High School
  Joe Stringer1, Mathematics, Middletown High School

10:55  **Break**

11:05  **Maker Spaces and Science Clubs in the Schools** (115)
Mark Lucas, Ohio University, 30 min
"Maker Spaces" are popping up all over the country, including
in the schools. As well, there is the time-honored, after-school science club. What are the challenges with these kinds of endeavors and what kinds of resources are available?

11:05  *Intrinsic and Extrinsic Motivators in the Classroom* (122)
*Samantha Fetters*, Shawnee State University, 12 min
Fetters presents her research on intrinsic and extrinsic motivators in the classroom.

11:05  *STEM Interventions to Increase or Reinforce Girls’ Interest in STEM Fields* (126)
*Elisabeth Kager*, Ohio University, 12 min
Kager gives a brief overview of how and why various STEM interventions can support girls' interest in STEM fields and anticipated STEM careers. Then she will introduce the Women in the Sciences (WITS) camp, which is held annually at Marietta College, and talk about its specific benefits.

11:05  *The Use of Abstract Algebra in High School* (127)
*Joseph Smart* and *Levi Thompson*, Ohio University, 30 min
Smart and Thompson discuss how abstract algebra can be used in high schools through three activities: permutations, modulos, and groups or group theory.

11:05  *Common Core Content for Teachers and Students* (322)
*Gregory Foley*, Ohio University, 30 min
Ohio’s new graduation requirements and learning standards call for high school mathematics teachers to address the topics of statistics, probability, and modeling. The Advanced Quantitative Reasoning course for high school seniors and the Advanced Teacher Capacity professional development program for teachers provide common sense solutions for this Common Core content.

11:23  *Who Should Do the Talking?* (122)
*Mariah Breech*, Shawnee State University, 12 min
Breech researched students' perspectives on having a classroom that solely uses student-led instruction. Here, she presents her
findings.

11:23 **Engaging in Teacher Research to Create More Equitable Mathematics and Science Classrooms** (126)
**Mathew Felton-Koestler and Courtney Koestler, Ohio**
In this session, we will discuss an upcoming opportunity for teachers to engage in a teacher research study group focused on creating more equitable mathematics and science classrooms.

11:35 **Lunch and Conversations** (pick up a boxed lunch in 2nd floor foyer)
Choose Appalachian Teaching Scholar Gathering (115)
Woodrow Wilson Teaching Fellows Gathering (122)
Noyce Scholar Gathering (126)
K–12 STEM Educator Gathering (322)

12:35 **Building Physics Demonstrations with Your Classes** (115)
**Lawrence King, Warren High School, 30 min**
Lawrence King, a physics teacher, shares his current classroom building projects on electrical concepts. A capacitor build will be held, followed by an open sharing of your favorite building projects. Bring your successes and failures, and tips for science building projects that are on task, and on time. Examples are welcome.

12:35 **The Connectedness of STEM in Students’ Lives** (122)
**Ahmad Alhammouri³ and Derek Sturgill³, Ohio University, 30 min**
This presentation will highlight NCTM’s Connections Standard as well as provide insight about establishing STEM connections in your classroom. The second half of this presentation will be reserved for an engaging discussion where participants collectively share their ideas about STEM and construct tasks to use in their classroom.

12:35 **Referring to the Common Core** (126)
**Samantha Hammond², University of Rio Grande, 12 min**
Hammond discusses the Common Core and how it has
changed when we teach certain things, for example, probability and statistics. She focuses on 7th and 8th Grade standards for probability and statistics and ends with an example to use in the classroom: "Favorite Music Genre."

12:35  *The Importance of Modeling with Mathematics in K-12 Schools (127)*

**Reuben Asempapa³, Ohio University, 30 min**
Mathematical modeling competencies have been under emphasized in most K-12 classrooms. However, research indicates that significant mathematical and social improvements occur in students when engaged with modeling. This presentation demonstrates the essence and relevance of modeling with mathematics. Modeling tasks encourage the development of mathematical practices useful for today’s world.

12:35  *Future Directions of the SouthEast Ohio Center for Excellence in Mathematics and Science (SEOCEMS) (322)*

**Jeff Connor, Courtney Koestler, and Ralph Martin, Ohio University, 30 min**
Come meet the directors of SEOCEMS to hear about current projects, discuss ways to collaborate with university faculty, and give input about the center’s future directions.

12:53  *Going for a Home Run the First Time at the Plate (126)*

**Alex Blohm, Franklin Heights High School, 12 min**
As a first-year teacher, Blohm implemented a week-long lesson that combined project-based learning, co-teaching, establishing classroom norms, and statistics in his Inclusion Algebra I classes.

1:05  **Break**

1:15  *Using Knowledge of Learning Styles to Increase Success and Satisfaction in Science Courses (115)*

**Linda Rogness, Muskingum University, 30 min**
Research in engineering courses shows that using teaching methods that employ the use of different learning styles
improves student success and satisfaction. This can be extrapolated to all science courses. This presentation will talk about the research and how to use different ways of teaching to engage all students and improve student learning.

1:15  **Google Apps and the New Google Classroom** (126)
**Tony Tracy**, Belpre High School, 30 min
Tony Tracy introduces participants to free educational tools that allow for automatic grading of tests, organizational support for students, and effortless formative assessments. Personal computer recommended.

1:15  **Baa Hozho Navajo Nations Math Circle Project** (127)
**Robert Klein**, Ohio University, 30 min
Klein reports on the work of the Navajo Nations Math Circles Project as well as local student and teacher Math Circles. Sample activity will be provided to give a sense of sessions.

1:15  **The "M" in SET** (322)
**Derek Sturgill**, Ohio University, 30 min
Sturgill’s presentation focuses on using mathematical problems as an inclusive method to challenge students' thinking and to focus on problem solving.

1:45  **Break**

1:55  **Introduction of Keynote Speakers** (237)
**Gregory Foley**, CAT Program Director

2:00  **Myths and Omissions in Rural Education** (237)
**Robert Klein and Daniel Showalter**, Mathematics, Ohio University, 45 min
Klein and Showalter provide an overview of the health of rural education on 24 indicators in various states nationwide. Using data, they will dispel some myths and fill in some omissions about rural education.

2:45  **Closing Remarks** (237)
**Gregory Foley**, CAT Program Director
The purpose of the Appalachian Ohio Mathematics and Science Teaching Research Symposium is to build and strengthen K–12 mathematics and science teaching throughout southern and eastern Ohio through the building and fostering of relationships among pre-service and in-service teachers and university and college faculty.

The symposium is sponsored by the Gladys W. and David H. Patton College of Education; the Southeast Ohio Center for Excellence in Mathematics and Science (SEOCEMS); 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 Patton College Associate Deans John Henning and Ann Paulins.

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

Help us improve the symposium by filling out a symposium evaluation survey, available at the registration evaluation tables during the lunch hour.