

# Practice-able Science

*Taking 21<sup>st</sup> Century Science  
Into the Classroom & Beyond!*



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**2017 STOM Conference**

**Saturday, October 14, 2017**

**Hickman High School – Columbia, Mo**



**07:30 – 08:30am**

1. **Registration**  
West Lobby – Hickman H.S.
2. **Vendors**  
West Lobby – Hickman H.S.

**Poster Session 8:30am-3:30pm**

**Undergraduate Science Research at the University of Missouri**  
**Grades K-12**

Are you curious about new discoveries and ongoing research in your science discipline? Come talk to undergraduate students from the University of Missouri who have engaged in summer research projects in physics, astronomy, biology, and nanotechnology. MUColumbia is recognized as a research-intensive university (Research I) according to the Carnegie classification. Our students will present results from cutting-edge research labs this summer. Topics range from characterizing star dust to understanding how a single protein in a cell wall moves to using berries to target cancer cells. Come learn what is going on in your neighborhood research lab!

**Hickman HS Upper Commons**

**Karen King**

Assistant Professor, University of Missouri

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***with this promo code: KS2017***

**SESSION 1 08:30 – 09:25am**

1. **Exploring Missouri Wildlife**  
**Grades K-2 (Physical, Life, Earth and Space, Engineering)**  
The Missouri Species Coloring Sheets contain a colorable image of over two dozen species plus information on their range, habitat, food preferences, life cycles and more. Learn to use the sheets with K-5 to explore Missouri wildlife.  
**Room 108**  
**Jan Weaver**  
Executive Director; Missouri Environmental Education Association

2. **Elementary Engineering: How it works and fits into the curriculum**  
**Grades K-5**  
In this session, you will learn the basics behind teaching engineering in grades K-5. Ideas will be shared on how to begin teaching engineering as well as a continuum of ideas for engineering projects. Teachers will also have an opportunity to try out some engineering challenges themselves.  
**Room 110**  
**Heather McCullar**  
STEM Specialist; Benton STEM Elementary
3. **Building STEM Literacy through Career Exploration**  
**Grades 6-9**  
STEM is everywhere, and we want students to see that. Through interactive problem-based scenarios, Endeavor takes students into the science, technology, engineering, and math behind their world, and introduces them to inspiring careers they never knew existed.  
**Room 112**  
**Heather Miller**  
Schools Manager; EverFI  
**Ben Gwynne**  
Senior Schools Manager, EverFI
4. **Hands-on Human Ecology for the Next Generation**  
**Grades 6–12**  
Discover innovative activities for the new Missouri Learning Standards that explore population growth, carrying capacity, human impacts on the environment and paths to sustainability.  
**Room 117**  
**Lloyd Barrow**  
Professor Emeritus of Learning, Teaching and Curriculum; University of Missouri
5. **Going Viral! Explorations in Microbial Genetics**  
**Grades 9-12**  
An ‘Outbreak’ of classroom ready learning experiences exploring the awesome potential of viruses to change lives and cultures. Investigations address virus diversity, models of virus reproduction, emerging viral epidemics, and viral comparative genomics/evolution.  
**Room 208**  
**Pam Close**  
Columbia Public Schools; Hickman High School

6. **Assessing Labs and Experiments Using "BioBlitz" Presentations**

**Grades 9-12**

Changes to science education based upon NGSS, ESSA, and AP make inquiry labs more important than ever; however, they can be difficult to assess outside of worksheets and lab questions, which are far from inquiry. This session shall introduce participants to the "BioBlitz," which requires that students present their lab data in a 1 slide, 60 second presentation that prepares them for poster sessions and peer review.

**Room 214**

**Ryan Lacson**

Galena R-II Schools; Galena Jr/Sr High

7. **A Picture-Perfect Approach to Connecting Science and Literacy**

**Grades K-2**

Need ideas to connect literacy and science? Never before has it been so easy to interest students in reading and science. Picture-Perfect Science Lessons combine the appeal of children's picture books with standards-based science content. Leave with ideas on how to begin the integration in your classroom.

**Room 213**

**Kim Stillwell**

Program Integrations; NSTA

8. **Diversity in the Science Classroom**

**Grades K-12**

Considering how to recruit and retain a diverse group of science educators while supporting and respecting all students in the quest for quality science instruction.

**Room 216**

**Eric Hadley**

Science Coordinator; Ferguson Florissant School District

9. **Investigating Plate Boundaries**

**Grades 3-12**

Adapted from Rice University's "Discovering Plate Boundaries" this exploratory jigsaw activity allows students to discover the processes that occur at plate tectonic boundaries. Requires students analyze data maps (Earthquakes, Volcanoes, Seafloor Age, Topography), identify trends in maps, collaborate, and categorize plate boundaries.

**Room 220**

**Heather Jones**

Gentry Middle School (8<sup>th</sup> Grade), Columbia Public School

10. **Evolution for Educators**

**Grades 6-12**

The Teacher Institute for Evolutionary Science is an entirely teacher-run project to help middle school science teachers. We provide evolution content and ready-to-use resources for the classroom, including presentation slides, online sites, and hands-on labs.

Everything is free and high-quality.

**Room 222**

**Jessica Platto**

Biology Teacher, Hickman High School, Columbia MO

11. **Phenomena, More Ordinary than Extraordinary**

**Grades K-12**

Phenomena or observable events add interest to science lessons. Explaining phenomena is central to student learning in science. This session explores criteria for choosing phenomena and best integration practices.

**Room 116**

**Susan German and Betsy O'Day**

Middle School Science Teachers; Hallsville R-IV School



**National Association of Biology Teachers Conference  
November 9-12, 2017**

Join other leaders in biology and life science education for four days of renowned speakers, hands-on workshops, informative sessions, and special events that you can't get anywhere else!

Advance registration ends October 23, and all STOM members are eligible for a discount!

Visit <https://www.nabt.org/Events2017-Conference>



**Professional Development Conference**  
ST. LOUIS UNION STATION HOTEL • ST. LOUIS, MO

## SESSION 2 09:35 – 10:30am

1. **STEM Sound Project -- Cancelled**
2. **Developing a Model of Light**  
**Grades 9-12**  
In MSLS (9-12.PS4.A.2), students evaluate the idea that “electromagnetic radiation can be described either by a wave model or a particle model”. What does “wave model” mean? What evidence suggests that light can be modeled as both?  
**Room 110**  
**Karen King**  
Assistant Teaching Professor; University of Missouri  
**Kory Kaufman**  
Science Teacher, Rock Bridge HS, Columbia MO
3. **Science classrooms that support diverse students' STEM and ELA abilities**  
**Grades 6-12**  
Text sets and linked activities support inquiry by providing diverse learners with the opportunity to meaningfully build STEM understanding while accessing rich informational literary content. This session will explore enrichment units focusing upon grade 6-9 Science Grade Level Expectations (2016) and English Language Arts Grade Level Expectations (2016) about:  
• How we (and other vertebrates) perceive light and sound energy.  
• Impact of anthropogenic production of carbon dioxide upon plant photosynthesis, acidification of the oceans and bleaching of coral reefs. The enrichment units are being developed with support of the U.S. National Institutes of Health through a new MU program that includes teacher professional development and help with classroom implementation. Participants will acquire tools for building and refining instructional content that support diverse students' STEM and ELA abilities and college preparation.  
**Room 112**  
**William (Bill) Folk**  
Professor; University of Missouri  
**Delinda Van Garderen**  
Professor, University of Missouri
4. **"Minionese" Reaching the ELL student in the science classroom**  
**Grades 6-12**  
Experience the world of the ELL science student through your own eyes. This training will provide teachers of ELL students powerful and effective tools that support vocabulary, literacy and engagement in the science classroom.  
**Room 117**  
**Marcia Steeby**  
Biology Teacher; St. Joseph School District  
**Georgia Wisler**  
ESOL Teacher; St. Joseph School District
5. **Cancelled**
6. **Incorporation of Creating Writing Techniques to Increase Learner Engagement in Collegiate Molecular Science Curricula**  
**Grades 6-12**  
Are you looking for simple, low budget activities to integrate health science and “big data” into your secondary school (grade 7-12) curriculum? These lessons involve incorporating over-the-counter medicine safety and osteoporosis education into life science classrooms.  
**Room 216**  
**Erin Sellner**  
Assistant Professor of Biochemistry; Stephens College
7. **Literacy Strategies that Engage Students**  
**Grades 6-12**  
Wondering what to do with science news and current events? Explore engaging content literacy strategies that allow all students to explore new ideas, think critically and make connections.  
**Room 220**  
**Mary Coogan**  
Science Department Chair; Liberty North High School  
**Rosemary Camp**  
Administrative Intern, Liberty North High School
8. **Science Fair is for Me!**  
**Grades 6-12**  
In the world of Project-Based Learning- Let's go "Old School" with Science Fairs-what the process is for ISEF, ISWEEEP and Genius Olympiad  
**Room 213**  
**Elizabeth Hobbs**  
Science Teacher; Washington High School

### *NSTA Special Offer*

*Take 20% off all online orders*

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*with this promo code: KS2017*

9. **Helping Students Visualize Chemistry Concepts Through Practice-able Science**  
**Grades K-2**  
 Feel like you're not doing enough science in your K-2? Learn about how adding one more ingredient will actually boost your students' learning: literacy!  
**Room 222**  
**Jenna Mercury**  
 Educational Specialist; Science4Us
  
10. **Adventures in Flipped-Mastery: The Dos and Don'ts of Changing a Traditional Classroom into a Flipped Learning and Objective Mastery Environment**  
**Grades 6-12**  
 Three high school chemistry teachers reflect and present on the do's and do not's of implementing a flippedmastery classroom model based on their personal experience.  
**Room 214**  
**Hannah Nandor, Shanna Barkume, & Julie Gastler**  
 Science Teachers; Battle High School, Columbia MO
  
11. **Add Depth to Student Learning Through Using the 3 Dimensions**  
**Grades K-12**  
 3-Dimensional Learning deepens student conceptual learning of science. Bring a lesson to the session that you use to build student conceptual understanding. This session will assist you in modifying it to include the three dimensions.  
**Room 116**  
**Susan German and Betsy O'Day**  
 Middle School Science Teachers; Hallsville R-IV School District
  
2. **Before the Puck Drops - Teaching Science to Students Through Hockey**  
**Grades 3-8**  
 Attendees will gain access to a web-based resource that is available at NO COST: Hockey Scholar: This course brings science concepts to life using the exciting, game of hockey. Through immersive simulations, students explore real-life applications of science concepts.  
**Room 110**  
**Heather Miller**  
 Schools Manager, EverFI  
**Ben Gwynne**  
 Senior Schools Manager; EverFI
  
3. **Utilizing Smithsonian Resources in your classroom**  
**Grades 6-8**  
 A combination of alternative PD examples, resources, and curriculum for inside and outside learning  
**Room 112**  
**Amy Peoples**  
 Middle School Science Teacher; Chillicothe R-II Middle School
  
4. **OMG, What's OER? IDK, Let's Find Out!**  
**Grades K-12**  
 Is your science team interested in Open Education Resources (OER's)? Would you like to help develop a rich, state-wide, network of shared content and curriculum based on the Missouri Learning Standards? Come see what Liberty's Biology team is doing and how you can do it in your schools.  
**Room 209**  
**Juli Hustoft**  
 Biology Teacher; Liberty North High School **Ryan Dahm**  
 Biology Teacher, Liberty North High School

### **SESSION 3 10:40 – 11:35am**

1. **Project-Based Science Learning**  
**Grades K-2**  
 This session focuses on Project-Based Learning for elementary science. Science A-Z's Project-Based Learning Packs will be explored, providing resources that encourage students to use 21st Century skills as they work in teams to investigate an overarching science question or design solutions for an engineering challenge. Free trials for all!  
**Room 108**  
**Lori Smith**  
 National Curriculum Consultant; Learning A-Z
  
5. **Socio-Scientific Issues Teaching and Learning**  
**Grades 9-12**  
 An instructional framework for teaching high school science through an issues-based approach. A variety of issue-based curriculum units co-designed with teachers will be shared. Sample lessons included.  
**Room 216**  
**Amanda Peel**  
 Graduate Student; University of Missouri  
**Troy Sadler**  
 Professor, University of Missouri

6. **Engaging ALL Students in Science using Anchor Phenomena and 3-D Integrated Language Rich Instruction in Life Science.**

**Grades K-College**

With the recent release of the Next Generation Science Standards and the emphasis that is now associated with language intensive 3-dimensional learning, a concern exists on how to enable all students, but especially (ELL), to meet the more rigorous and sophisticated standards, by achieving 3-dimensional thinking and learning within this framework. This session will share with participants the importance of experiential learning that is used prior to and simultaneously with the development of the language modalities associated with learning science and integrated STEM disciplines. Experiential learning refers to developing rich context in which students engage in phenomena while using authentic and meaningful dialogue to develop meaning. The session will utilize a Learning Cycle format as the participants are engaged in the phenomena of "How does the non-living (abiotic) enter into the living (biotic) world and when does the living (biotic) return to the non-living (abiotic) world." This phenomenon will be explored through food chains / webs through engaging literature to establish background content knowledge (listening and speaking), participants will then create in a kinesthetic food web where all students will be linked with yarn by trophic level (PSE) (listening, speaking, simple reading, writing). Participants will then have an opportunity to learn the concept of food webs and energy flow (DCI) with appropriate academic vocabulary strategies (listening, reading, and writing), the elaboration activity will focus on human interactions to the given ecosystem (CCC) (Speaking and writing), and the final phase of the activity will focus on 3 Dimensional summative projects to assess knowledge learned (with adaptations for different ELD levels).

**Room 117**

**David Crowther**

2017-2018 President, NSTA

7. **Appy Hour**

**Grades 6-12**

Come explore a variety of apps for teaching science in middle and high school. We'll have apps across the sciences that run on a variety of devices.

**Room 213**

**Pat Friedrichsen**

Professor, Science Education; University of Missouri

**Clayton Elmy, Kara Schulte, Jess LaSota, Jordan Young, Van Ediger, Brad Gallow, Matt Graham, Tanner Hakert, Holden Hirsch, Joe Klatka, Sarah Laster, Jacob McKiddy, Brett Morris, Jesse Singleton, Danielle Speckman, Matt Negron, Catherine Sadowski, AJ Womack, Eric Wulff, and Mandy Peel** NSTA Student Chapter

8. **Hands-On Mathematics in Science Education Grades K-2**

This presentation focuses on four modules that showcase an integrated STEM process in which mathematics takes central stage. The modules fully meet standards. The mathematics is necessary to construct a design decision and check how well the proposed solutions meet criteria and constraints. Collaborative aspects between math and science will be discussed, and participants will leave with a pathway to incorporate mathematics into other STEM units.

**Room 220**

**Johannes Strobel**

Professor; University of Missouri

**Olivia Hua**

Ph.D. Candidate, McGill University

9. **Serving up the "T" in STEAM!!!**

**Grades 6-12**

Over the last 3 years we have improved our use of Schoology to a point where we are almost paperless, and students utilize it daily with their warm-up discussions, assignments (including readings, videos, and interactives), reflections on assignments, and assessments. It has streamlined our ability to provide immediate, meaningful feedback and decreased the amount of papers we collect and carry around to grade. Students become better at holding themselves accountable and following up on missing work. Resources are always available, and students and teachers can access past assignments and assessments with ease. In addition, we use Schoology as a platform for students to access other online media and learning resources. Join us as we share with you how to streamline your lessons and grading and improve the self-efficacy of your students through the use of Schoology, EdPuzzle, Notability, Nearpod, and Google Docs. (Technology that can be used - iPads, mobile phones, laptops)

**Room 222**

**Caitlin Cunningham**

Gentry MS (8<sup>th</sup> Grade), Columbia MO

**Heather Jones**

Gentry MS (8<sup>th</sup> Grade), Columbia MO

10. **Tell a Conceptual Story Using the 5 E Instructional Model**

**Grades K-12**

A conceptual story creates a narrative for students to organize learning. Using the 5E Instructional Model, learn how to develop lessons designed to deepen student learning with attention given to a coherent conceptual storyline.

**Room 116**

**Susan German and Betsy O'Day**

Middle School Science Teachers; Hallsville R-IV School District

**GENERAL SESSION I 11:40 – 12:10pm**

Learn about STEM, Science Education, ESSA, the best ways to get funding for science education, and how to become a champion/advocate for science.

**Hickman HS Commons**

**Jodi Peterson**

Assistant Executive Director: Communications, Legislative, and Public Affairs, National Science Teachers Association; Chair, STEM Education Coalition

**GENERAL SESSION II 12:15 – 1:25pm**

**Hickman HS Commons**

1. **Lunch**

2. **Awards Presentation**

3. **Keynote Presentation**

**Transitioning to Three-Dimensional Teaching  
Grades K-12**

The Framework for K-12 Science Education and the Next Generation Science Standards advocate for a ThreeDimensional (3D) approach to teaching science. The three dimensions proposed by the Framework include Disciplinary Core Ideas, Science and Engineering Practices, and Cross Cutting Concepts. For teachers, administrators, parents and science educators to fully understand the Framework and the complexity of the 3D approach to teaching and learning, there are several “shifts” in thinking and teaching that need to be made. This session will engage the participants with a natural phenomenon using the Tonle Sap River / Mekong in Cambodia as a way of understanding how to use the natural world and curiosity to frame the teaching of science. After the phenomena, participants will then explore philosophical, pedagogical, professional development, assessment and supervisory (observational) shifts that must be considered to fully understand and use three-dimensional teaching and learning.

**David Crowther**

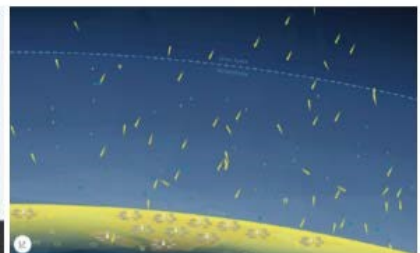
2017-2018 President, NSTA

**Amplify**Science

authored by



**THE LAWRENCE  
HALL OF SCIENCE**  
UNIVERSITY OF CALIFORNIA, BERKELEY



**Inspiring the next generation of scientists, engineers, and curious citizens**

Amplify Science is a breakthrough curriculum designed from the ground up to meet 100% of the Next Generation Science Standards. Authored by the industry-leading team at the Lawrence Hall of Science, Amplify Science is a highly-engaging, phenomena-based curriculum for grades K-8 that integrates the latest research and practices in science education, as well as interactive digital tools and hands-on activities, to teach students to think, read, write, and argue like real scientists and engineers.

**Stop by the Amplify booth to find out more about exclusive pilot opportunities!**



## SESSION 4 1:30 – 2:25pm

- 1. The Art of Questioning**  
**Grades 3-8**  
Questioning is an important component to guiding your lessons (ranging from essential questions to reflective questions), but how do we know if we're asking GOOD questions? We also need to teach our STUDENTS the art of questioning. This workshop will guide you into deeper, better questioning for critical thinking!  
**Room 108**  
**Barb Arnold**  
Elem. Science Specialist; Lee's Summit R-7
- 2. Integrating the New Missouri Science Standards and Math Using Trade Books**  
**Grades 3-5**  
This session will focus on integrating the new MLS for math and science using hands on activities and NSTA recommended books. Crosscutting concepts within the text will also be addressed.  
**Room 110**  
**Heidi Prouhet**  
3<sup>rd</sup> Grade Teacher; Wentzville R 4  
**Kasey Lann**  
Teacher, Wentzville R4
- 3. A Box Can Be Many Things**  
**Grades K-12**  
Project Based Learning, NOVEL Engineering, STEM Challenges & NGSS lead students to become 21st Century Learners. Get your students to think OUT OF THE BOX while solving real world authentic problems with this introductory Project Based Learning Lesson.  
**Room 112**  
**Jim Bruegenhemke**  
Boone Trail Elementary (6<sup>th</sup> Gr); Wentzville School District  
**Kim Kessler**  
3<sup>rd</sup> Grade Teacher, Crossroad Elementary
- 4. Why YOU & Your Students NEED to be FLIPPED!**  
**Grades 6-12**  
Flipping in the science and math classroom changes EVERYTHING. Flipping changes EVERYTHING about science instruction and allows us to teach through hands on, instead of lecture based learning, in the classroom. It is a more effective way of teaching for this century!  
**Room 117**  
**Barb Steel**  
Science Teacher/Science Department Chairperson; West St. Francois County High School
- 5. Phenomena First: Authentic Experiences in Biology (Evolution)**  
**Grades 6-College**  
The "phenomena first" approach allows students the opportunity to learn science through an authentic approach. Participants will be presented with lessons for teaching evolution utilizing this approach. S1: Common Ancestry; S2: Natural Selection  
**Room 209**  
**Jay Meyers**  
Curriculum Advisor / Science Teacher; Central High School; St. Joseph School District  
**Monica Flaska**  
Teacher, Central HS, St Joseph MO
- 6. Using CDC Resources to Incorporate Public Health Issues into the Classroom**  
**Grades 7-12**  
Use project-based learning to engage students in public health and the roles of public health in our communities for topics in nutrition, obesity, and pandemic influenza. Apply scientific ideas, principles, and evidence to provide an explanation about the causes and correlations of health and disease using epidemiologic thinking.  
**Room 214**  
**Ryan Lacson**  
Galena R-II Schools; Galena Jr/Sr High  
**Clara Bennion**  
Science Teacher; Camdenton High School
- 7. It's a Dog's Life: Investigating Puppy Genomics**  
**Grades 6-12**  
Explore canine genomics with a highly engaging activity which compares single-nucleotide polymorphisms (SNPs) of dogs with different phenotypes (Warning: cute puppy ahead!) and leads students through analyses to identify statistical correlations.  
**Room 208**  
**Pam Close**  
Biology Teacher, Hickman High School, Columbia Public Schools

## SESSION 5 2:30 – 3:25pm

### 8. Prepare for Next Generation Science Standards with Online Interactive Simulations

#### Grades 6-12

Online interactive simulations help prepare students for the Next Generation Science Standards which are not only rich in content for students to understand deeply, but also rich in science practice. Using simulations, students can manipulate key variables, generate and test hypotheses, and engage in extensive “what-if” experimentation. Simulations also allow students to collect, analyze and interpret data, use and evaluate models of scientific concepts, and identify patterns at different scales in a system. These activities fulfill the goals described in 'A Framework of K-12 Education' in its Standards of Scientific and Engineering Practice, Crosscutting Concepts, and Disciplinary Core Ideas.

#### Room 213

#### Patty Low

Curriculum Support; ExploreLearning

### 9. Three-Dimensional Learning in the Elementary Classroom

#### Grades K-5

The participants will engage in a science investigation to discover how the three dimensions are combined together in the performance expectations in order for students to build a cohesive understanding of science over time. Science practices are the processes of using the core ideas of science to make sense of the natural and designed world, and crosscutting concepts hold the disciplines together.

#### Room 216

#### Shelley Nordquist

RETIRED Elementary Curriculum Coordinator; St. Joseph School District

### 10. Cancelled

### 11. Assessing the 3 Dimensions

#### Grades K-12

Three-dimensional learning requires three-dimensional assessment. Learn how to develop questions designed to elicit more than knowledge level responses

#### Room 116

#### Susan German/Betsy O'Day

Middle School Science Teachers; Hallsville R-IV School

### 1. The Power of Questioning and the Power of Investigation: Guiding Authentic Assessments Grades K-2

Bring science to life as we transform two-dimensional lessons into three-dimensional learning experiences! Let students' questions guide the inquiry while integrating collaborative conversations, reading of informational text, and writing. Learn hands-on strategies to launch investigations and fuel student thinking and learning.

#### Room 213

#### Kim Stillwell

Program Integrations; NSTA

### 2. Tools and Resources to Take Your Students from Novice to Expert in 3D Learning Grades K-12

Learn about our free resources (rubrics, visual aids, and handouts) to grow your students' mastery of the crosscutting concepts and science and engineering practices. Most resources are adapted to K-8 but could be used with younger or older students.

#### Room 110

#### Jeanne Norris

K-8 Curriculum Coordinator; Washington University in St. Louis Institute for School Partnership

### 3. Current Events in the Science Curriculum Grades 6-12

Using current news events, students will examine the connection between science and the real world. Students will develop target audiences and see how science technologies are helping people to lead fuller, more productive lives.

#### Room 112

#### Lindsay Ash

Teacher (8<sup>th</sup> Grade); Ozark Junior High

### 4. Project based Learning - Life Science in Real Life Grades 6-8

Have you been looking for a readymade project for your life science students? Then this is the presentation for you! I will be showing you a project that I created for my middle school life science students that blends Ecosystems and conservation.

#### Room 117

#### Erin Branstetter

Teacher; Bolivar Middle School

5. **How to Tell Geologic Time**

**Grades 6-12**

The workshop will explore the principles of relative and absolute dating, with applications to societal issues. Participants will engage in activities that can be immediately used in your classroom to enhance understanding of several important geologic concepts.

**Room 209**

**Alan Whittington**

Professor; University of Missouri

**Jesse Merriman**

Graduate Research Assistant

6. **Standards Based Grading in a Science Classroom**

**Grades K-12**

This workshop includes a discussion of the benefits of standards based grading for the student and teacher. Instructions on setting up standards based grading for your class and examples of how it works in my class will be included.

**Room 108**

**Deborah J Trafford**

Science Teacher; McCluer North HS

7. **DESE Assessment Panel Discussion**

**Room 214**

Moderated by **John Kitchens**

DESE Science Consultant

8. **Questioning Strategies: How do Questions Impact Teaching and Learning**

**Grades K-12**

This presentation focuses on two types of questions—"open ended" and "closed-ended" questions. We will analyze the impacts of both types of questions on student thinking and behavior, and using this information to help decide how and when to best use these two types of questions.

**Room 116**

**Kristen Schulte**

Ed Coordinator; Missouri River Relief

9. **NGSS Outside of the Classroom Walls: Incorporating Nature, Data Collection, and Robotics with Our Science Curriculum**

**Grades 6-12**

Come and explore the innovative, farm based Science program that incorporates data collection, robotics, bee hives, chickens and orchards for middle school to high school students at Metro East Montessori School. NSTA Award winning teacher, Carrie Wilson Herndon, will provide hands on activities for you to redefine what Science could look like in (or outside of)

your classroom. Highlights from the Science Scope (Summer 2017) article titled, "An Innovative Twist: Incorporating a Farm into Our Science Curriculum" and lessons from the farm will be the focus of how you can help prepare our future generations for the innovation era. Learn how incorporating bee hives, chickens, orchards, and robotics lessons with NGSS invigorates your lessons and motivates students. Hands on activities include an introduction to robotics, data collection, and bee keeping.

**Room 220**

**Carrie Wilson Herndon**

Faculty, Science, Math, and STEM; Whitfield School

10. **Modeling Evolution: Active lessons to have students explore and understand evolution and phylogeny**

**Grades 6-12**

Explore ready-to-use materials that will have your students actively create models, question concepts, and deepen their understanding of phylogeny and evolution.

**Room 222**

**Heather Essig**

Science Teacher; Visitation Academy - Saint Louis

11. **How to Put It All Together**

**Grades K-12**

In this session, come ready to design a unit of study for your classroom by choosing phenomena, writing storylines, mapping expectations, and determining an assessment strategy.

**Room 116**

**Susan German and Betsy O'Day**

Middle School Science Teachers; Hallsville R-IV School District

**GENERAL SESSION III 3:30 – 4:00pm**

Hickman HS Commons

**DESE Science Updates**

John Kitchens, DESE Science Consultant

**Wrap-Up 4:00 pm**

Hickman HS Commons

Announcements -- Door Prizes -- Questions

## Quick View - K-2 Strand

Time	Room #	Session Information
8:30-9:25	108	<b>Exploring Missouri Wildlife - Grades K-2</b> Jan Weaver - Executive Director; MO Environmental Education Association
	110	<b>Elementary Engineering: How it works and fits into the curriculum - Grades K-5</b> Heather McCullar - STEM Specialist; Benton STEM Elementary
	213	<b>A Picture-Perfect Approach to Connecting Science and Literacy - Grades K-2</b> Kim Stillwell - Program Integrations; NSTA
	216	<b>Diversity in the Science Classroom- Grades K-12</b> Eric Hadley - Science Coordinator; Ferguson Florissant School District
	116	<b>Phenomena, More Ordinary than Extraordinary - Grades K-12</b> Susan German and Betsy O'Day – MS Science Teachers; Hallsville R-IV School District
9:35-10:30	108	<b>STEM Sound Project - Grades K-5</b> Melissa Frericks - New Franklin Elementary (2 <sup>nd</sup> Grade) Jodie Langston - Curriculum Director, New Franklin R-1
	222	<b>Helping Students Visualize Chemistry Concepts Through Practice-able Science - Grades K-2</b> Jenna Mercury - Educational Specialist; Science4Us
	116	<b>Add Depth to Student Learning Through Using the 3 Dimensions - Grades K-12</b> Susan German and Betsy O'Day – MS Science Teachers; Hallsville R-IV School District
10:30-11:35	108	<b>Project-Based Science Learning - Grades K-2</b> Lori Smith - National Curriculum Consultant; Learning A-Z
	117	<b>Engaging ALL Students in Science using Anchor Phenomena and 3-D Integrated Language Rich Instruction in Life Science. - Grades K-College</b> David Crowther - 2017-2018 President, NSTA
	209	<b>OMG, What's OER? IDK, Let's Find Out! - Grades K-12</b> Juli Hustoft - Biology Teacher; Liberty North High School Ryan Dahm - Biology Teacher, Liberty North High School
	220	<b>Hands-On Mathematics in Science Education - Grades K-2</b> Johannes Strobel - Professor; University of Missouri Olivia Hua - Ph.D. Candidate, McGill University
	116	<b>Tell a Conceptual Story Using the 5 E Instructional Model - Grades K-12</b> Susan German and Betsy O'Day - MS Science Teachers; Hallsville R-IV School District

## GENERAL SESSION I 11:40 – 12:10pm

Hickman HS Commons

### NSTA Presentation

Jodi Peterson, Assistant Executive Director: Communications, Legislative, and Public Affairs, National Science Teachers Association; Chair, STEM Education Coalition

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## GENERAL SESSION II 12:15 – 1:25pm

Hickman HS Commons – Lunch – Awards Presentation –

### Keynote Presentation: Transitioning to Three-Dimensional Teaching: Grades K-12

David Crowther, 2017-2018 President, NSTA

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1:30-2:25	112	<b>A Box Can Be Many Things - Grades K-12</b> Jim Bruegenhemke - Boone Trail Elementary (6 <sup>th</sup> Grade); Wentzville School District Kim Kessler - 3 <sup>rd</sup> Grade Teacher, Crossroad Elementary
	216	<b>Three-Dimensional Learning in the Elementary Classroom - Grades K-5</b> Shelley Nordquist - RETIRED Elementary Curriculum Coordinator; St. Joseph School District
	116	<b>Assessing the 3 Dimensions - Grades K-12</b> Susan German/Betsy O'Day - MS Science Teachers; Hallsville R-IV School District
2:30-3:25	213	<b>The Power of Questioning and the Power of Investigation: Guiding Authentic Assessments - Grades K-2</b> Kim Stillwell - Program Integrations; NSTA
	110	<b>Tools and Resources to Take Your Students from Novice to Expert in 3D Learning Grades K-12</b> Jeanne Norris - K-8 Curriculum Coordinator; Washington University in St. Louis Institute for School Partnership
	108	<b>Standards Based Grading in a Science Classroom - Grades K-12</b> Deborah J Trafford - Science Teacher; McCluer North High School
	214	<b>DESE Assessment Panel Discussion - Grades K-12</b> Moderated by John Kitchens, DESE Science Consultant
	116	<b>Questioning Strategies: How do Questions Impact Teaching and Learning - Grades K-12</b> Kristen Schulte - Education Coordinator; Missouri River Relief
	116	<b>How to Put It All Together - Grades K-12</b> Susan German and Betsy O'Day - MS Science Teachers; Hallsville R-IV School District

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## GENERAL SESSION III 3:30 – 4:00pm

Hickman HS Commons - DESE Science Updates- John Kitchens, DESE Science Consultant

## Quick View - 3-5 Strand

Time	Room #	Session Information
8:30-9:25	110	<b>Elementary Engineering: How it works and fits into the curriculum - Grades K-5</b> Heather McCullar - STEM Specialist; Benton STEM Elementary
	216	<b>Diversity in the Science Classroom- Grades K-12</b> Eric Hadley - Science Coordinator; Ferguson Florissant School District
	220	<b>Investigating Plate Boundaries - Grades 3-12</b> Heather Jones - Gentry Middle School (8 <sup>th</sup> Grade), Columbia Public School
	116	<b>Phenomena, More Ordinary than Extraordinary - Grades K-12</b> Susan German and Betsy O'Day - MS Science Teachers; Hallsville R-IV School District
9:35-10:30	108	<b>STEM Sound Project - Grades K-5</b> Melissa Frericks - New Franklin Elementary (2 <sup>nd</sup> Grade) Jodie Langston - Curriculum Director, New Franklin R-1
	116	<b>Add Depth to Student Learning Through Using the 3 Dimensions - Grades K-12</b> Susan German and Betsy O'Day - Middle School Science Teachers; Hallsville R-IV School District
10:35-11:30	110	<b>Before the Puck Drops - Teaching Science to Students Through Hockey - Grades 3-8</b> Heather Miller - Schools Manager, EverFI Ben Gwynne - Senior Schools Manager; EverFI
	117	<b>Engaging ALL Students in Science using Anchor Phenomena and 3-D Integrated Language Rich Instruction in Life Science. - Grades K-College</b> David Crowther - 2017-2018 President, NSTA
	209	<b>OMG, What's OER? IDK, Let's Find Out! - Grades K-12</b> Juli Hustoft - Biology Teacher; Liberty North High School Ryan Dahm - Biology Teacher, Liberty North High School
	116	<b>Tell a Conceptual Story Using the 5 E Instructional Model - Grades K-12</b> Susan German and Betsy O'Day - MS Science Teachers; Hallsville R-IV School District

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### GENERAL SESSION I 11:40 – 12:10pm

Hickman HS Commons – NSTA Presentation

Jodi Peterson, Assistant Executive Director: Communications, Legislative, and Public Affairs, National Science Teachers Association; Chair, STEM Education Coalition

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### GENERAL SESSION II 12:15 – 1:25pm

Hickman HS Commons – Lunch – Awards Presentation –

**Keynote Presentation: Transitioning to Three-Dimensional Teaching: Grades K-12**

David Crowther, 2017-2018 President, NSTA

1:30-2:25	108	<b>The Art of Questioning - Grades 3-8</b> Barb Arnold - Elem. Science Specialist; Lee's Summit R-7
	110	<b>Integrating the New Missouri Science Standards and Math Using Trade Books Grades 3-5</b> Heidi Prouhet - 3 <sup>rd</sup> Grade Teacher; Wentzville R 4 Kasey Lann - Teacher, Wentzville R4
	112	<b>A Box Can Be Many Things - Grades K-12</b> Jim Bruegenhemke - Boone Trail Elementary (6 <sup>th</sup> Grade); Wentzville School District Kim Kessler - 3 <sup>rd</sup> Grade Teacher, Crossroad Elementary
	216	<b>Three-Dimensional Learning in the Elementary Classroom - Grades K-5</b> Shelley Nordquist - RETIRED Elementary Curriculum Coordinator; St. Joseph School District
	116	<b>Assessing the 3 Dimensions - Grades K-12</b> Susan German/Betsy O'Day - MS Science Teachers; Hallsville R-IV School District
2:30-3:25	110	<b>Tools and Resources to Take Your Students from Novice to Expert in 3D Learning Grades K-12</b> Jeanne Norris - K-8 Curriculum Coordinator; Washington University in St. Louis Institute for School Partnership
	108	<b>Standards Based Grading in a Science Classroom - Grades K-12</b> Deborah J Trafford - Science Teacher; McCluer North High School
	214	<b>DESE Assessment Panel Discussion - Grades K-12</b> Moderated by John Kitchens, DESE Science Consultant
	116	<b>Questioning Strategies: How do Questions Impact Teaching and Learning - Grades K-12</b> Kristen Schulte - Education Coordinator; Missouri River Relief
	116	<b>How to Put It All Together - Grades K-12</b> Susan German and Betsy O'Day - MS Science Teachers; Hallsville R-IV School District

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### **GENERAL SESSION III 3:30 – 4:00pm**

**Hickman HS Commons - DESE Science Updates- John Kitchens, DESE Science Consultant**

## Quick View - Middle School Strand

Time	Room #	Session Information
8:30-9:25	112	<b>Building STEM Literacy through Career Exploration - Grades 6-9</b> Heather Miller - Schools Manager; EverFi Ben Gwynne - Senior Schools Manager, EverFi
	117	<b>Hands-on Human Ecology for the Next Generation - Grades 6–12</b> Lloyd Barrow - Professor Emeritus of Learning, Teaching and Curriculum; Univ of Missouri
	216	<b>Diversity in the Science Classroom- Grades K-12</b> Eric Hadley - Science Coordinator; Ferguson Florissant School District
	220	<b>Investigating Plate Boundaries - Grades 3-12</b> Heather Jones - Gentry Middle School (8 <sup>th</sup> Grade), Columbia Public School
	222	<b>Evolution for Educators - Grades 6-12</b> Jessica Platto - Biology Teacher, Hickman High School, Columbia MO
	116	<b>Phenomena, More Ordinary than Extraordinary - Grades K-12</b> Susan German and Betsy O'Day - MS Science Teachers; Hallsville R-IV School District
9:35-10:30	112	<b>Science classrooms that support diverse students' STEM and ELA abilities - Grades 6-12</b> William (Bill) Folk - Professor; University of Missouri Delinda Van Garderen - Professor, University of Missouri
	117	<b>"Minionese" Reaching the ELL student in the science classroom - Grades 6-12</b> Marcia Steeby - Biology Teacher; St, Joseph School District Georgia Wisler - ESOL Teacher; St. Joseph School District
	216	<b>Incorporation of Creating Writing Techniques to Increase Learner Engagement in Collegiate Molecular Science Curricula - Grades 6-12</b> Erin Sellner - Assistant Professor of Biochemistry; Stephens College
	220	<b>Literacy Strategies that Engage Students - Grades 6-12</b> Mary Coogan - Science Department Chair; Liberty North High School Rosemary Camp - Administrative Intern, Liberty North High School
	213	<b>Science Fair is for Me! - Grades 6-12</b> Elizabeth Hobbs - Science Teacher; Washington High School
	214	<b>Adventures in Flipped-Mastery: The Do's and Don'ts of Changing a Traditional Classroom into a Flipped Learning and Objective Mastery Environment - Grades 6-12</b> Hannah Nandor, Shanna Barkume, & Julie Gastler - Science Teachers; Battle HS, Columbia
	116	<b>Add Depth to Student Learning Through Using the 3 Dimensions - Grades K-12</b> Susan German and Betsy O'Day - MS Science Teachers; Hallsville R-IV School District



- 10:35-11:30**    110    **Before the Puck Drops - Teaching Science to Students Through Hockey - Grades 3-8**  
Heather Miller - Schools Manager, EverFI  
Ben Gwynne - Senior Schools Manager; EverFI
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- 111    **Utilizing Smithsonian Resources in your classroom - Grades 6-8**  
Amy Peoples - Middle School Science Teacher; Chillicothe R-II Middle School
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- 117    **Engaging ALL Students in Science using Anchor Phenomena and 3-D Integrated Language Rich Instruction in Life Science. - Grades K-College**  
David Crowther - 2017-2018 President, NSTA
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- 209    **OMG, What's OER? IDK, Let's Find Out! - Grades K-12**  
Juli Hustoft - Biology Teacher; Liberty North High School  
Ryan Dahm - Biology Teacher, Liberty North High School
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- 213    **Appy Hour - Grades 6-12**  
Pat Friedrichsen - Professor, Science Education; University of Missouri  
Clayton Elmy, Kara Schulte, Jess LaSota, Jordan Young, Van Ediger, Brad Gallow, Matt Graham, Tanner Hakert, Holden Hirsch, Joe Klatka, Sarah Laster, Jacob McKiddy, Brett Morris, Jesse Singleton, Danielle Speckman, Matt Negron, Catherine Sadowski, AJ Womack, Eric Wulff, and Mandy Peel  
NSTA Student Chapter, University of Missouri
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- 116    **Tell a Conceptual Story Using the 5 E Instructional Model - Grades K-12**  
Susan German and Betsy O'Day - MS Science Teachers; Hallsville R-IV School District

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### **GENERAL SESSION I 11:40 – 12:10pm**

Hickman HS Commons – NSTA Presentation  
Jodi Peterson, Assistant Executive Director: Communications, Legislative,  
and Public Affairs, National Science  
Teachers Association; Chair, STEM Education Coalition

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### **GENERAL SESSION II 12:15 – 1:25pm**

Hickman HS Commons – Lunch – Awards Presentation –  
**Keynote Presentation: Transitioning to Three-Dimensional Teaching: Grades K-12**  
David Crowther, 2017-2018 President, NSTA

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- 1:30-2:25**    108    **The Art of Questioning - Grades 3-8**  
Barb Arnold - Elem. Science Specialist; Lee's Summit R-7
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- 112    **A Box Can Be Many Things - Grades K-12**  
Jim Bruegenhemke - Boone Trail Elementary (6<sup>th</sup> Grade); Wentzville School District  
Kim Kessler - 3<sup>rd</sup> Grade Teacher, Crossroad Elementary
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- 117    **Why YOU & Your Students NEED to be FLIPPED! - Grades 6-12**  
Barb Steel - Science Teacher/Science Department Chairperson; West St. Francois County High School
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209	<b>Phenomena First: Authentic Experiences in Biology (Evolution) - Grades 6-College</b> Jay Meyers - Curriculum Advisor/Science Teacher; Central HS; St. Joseph School District Monica Flaska - Science Teacher, Central High School, Saint Joseph MO
214	<b>Using CDC Resources to Incorporate Public Health Issues into the Classroom - Grades 7-12</b> Ryan Lacson - Galena R-II Schools; Galena Junior/Senior High School Clara Bennion - Science Teacher; Camdenton High School
208	<b>It's a Dog's Life: Investigating Puppy Genomics: - Grades 6-12</b> Pam Close - Biology Teacher, Hickman High School; Columbia Public Schools;
213	<b>Prepare for Next Gen Science Standards with Online Interactive Simulations - Grades 6-12</b> Patty Low - Curriculum Support; ExploreLearning
116	<b>Assessing the 3 Dimensions - Grades K-12</b> Susan German/Betsy O'Day - MS Science Teachers; Hallsville R-IV School District
2:30-3:25	110 <b>Tools and Resources to Take Your Students from Novice to Expert in 3D Learning Grades K-12</b> Jeanne Norris - K-8 Curriculum Coordinator; Washington University in St. Louis Institute for School Partnership
	112 <b>Current Events in the Science Curriculum - Grades 6-12</b> Lindsay Ash - Teacher (8 <sup>th</sup> Grade); Ozark Junior High
	117 <b>Project based Learning - Life Science in Real Life - Grades 6-8</b> Erin Branstetter - Teacher; Bolivar Middle School
209	<b>How to Tell Geologic Time - Grades 6-12</b> Alan Whittington - Professor; University of Missouri Jesse Merriman - Graduate Research Assistant, University of Missouri
108	<b>Standards Based Grading in a Science Classroom - Grades K-12</b> Deborah J Trafford - Science Teacher; McCluer North High School
214	<b>DESE Assessment Panel Discussion - Grades K-12</b> Moderated by John Kitchens, DESE Science Consultant
116	<b>Questioning Strategies: How do Questions Impact Teaching and Learning - Grades K-12</b> Kristen Schulte - Education Coordinator; Missouri River Relief
220	<b>NGSS Outside of the Classroom Walls: Incorporating Nature, Data Collection, and Robotics with Our Science Curriculum - Grades 6-11</b> Carrie Wilson Herndon - Faculty, Science, Math, and STEM; Whitfield School
222	<b>Modeling Evolution: Active lessons to have students explore and understand evolution and phylogeny - Grades 6-12</b> Heather Essig - Science Teacher; Visitation Academy - Saint Louis
116	<b>How to Put It All Together - Grades K-12</b> Susan German and Betsy O'Day - MS Science Teachers; Hallsville R-IV School District

### GENERAL SESSION III 3:30 – 4:00pm

Hickman HS Commons - DESE Science Updates- John Kitchens, DESE Science Consultant

## Quick View - High School Strand

Time	Room #	Session Information
8:30-9:25	117	<b>Hands-on Human Ecology for the Next Generation - Grades 6–12</b> Lloyd Barrow - Professor Emeritus of Learning, Teaching and Curriculum; University of Missouri
	208	<b>Going Viral! Explorations in Microbial Genetics. - Grades 9-12</b> Pam Close - Columbia Public Schools; David H. Hickman High School
	214	<b>Assessing Labs and Experiments Using "BioBlitz" Presentations - Grades 9-12</b> Ryan Lacson - Galena R-II Schools; Galena Junior/Senior High School
	216	<b>Diversity in the Science Classroom- Grades K-12</b> Eric Hadley - Science Coordinator; Ferguson Florissant School District
	220	<b>Investigating Plate Boundaries - Grades 3-12</b> Heather Jones - Gentry Middle School (8 <sup>th</sup> Grade), Columbia Public School
	222	<b>Evolution for Educators - Grades 6-12</b> Jessica Platto - Biology Teacher, Hickman High School, Columbia MO
	116	<b>Phenomena, More Ordinary than Extraordinary - Grades K-12</b> Susan German and Betsy O'Day - MS Science Teachers; Hallsville R-IV School District
9:35-10:30	110	<b>Developing a Model of Light - Grades 9-12</b> Karen King - Assistant Teaching Professor; University of Missouri Kory Kaufman - Science Teacher, Rock Bridge HS, Columbia MO
	112	<b>Science classrooms that support diverse students' STEM and ELA abilities - Grades 6-12</b> William (Bill) Folk - Professor; University of Missouri Delinda Van Garderen - Professor, University of Missouri
	117	<b>"Minionese" Reaching the ELL student in the science classroom - Grades 6-12</b> Marcia Steeby - Biology Teacher; St. Joseph School District Georgia Wisler - ESOL Teacher; St. Joseph School District
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214 **Adventures in Flipped-Mastery: The Do's and Don'ts of Changing a Traditional Classroom into a Flipped Learning and Objective Mastery Environment - Grades 6-12**  
Hannah Nandor, Shanna Barkume, & Julie Gastler - Science Teachers; Battle HS, Columbia

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116 **Add Depth to Student Learning Through Using the 3 Dimensions - Grades K-12**  
Susan German and Betsy O'Day - MS Science Teachers; Hallsville R-IV School District

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10:35-11:30 117 **Engaging ALL Students in Science using Anchor Phenomena and 3-D Integrated Language Rich Instruction in Life Science. - Grades K-College**  
David Crowther - 2017-2018 President, NSTA

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209 **OMG, What's OER? IDK, Let's Find Out! - Grades K-12**  
Juli Hustoft - Biology Teacher; Liberty North High School  
Ryan Dahm - Biology Teacher, Liberty North High School

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216 **Socio-Scientific Issues Teaching and Learning - Grades 9-12**  
Amanda Peel - Graduate Student; University of Missouri  
Troy Sadler - Professor, University of Missouri

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213 **Appy Hour - Grades 6-12**  
Pat Friedrichsen - Professor, Science Education; University of Missouri  
Clayton Elmy, Kara Schulte, Jess LaSota, Jordan Young, Van Ediger, Brad Gallow, Matt Graham, Tanner Hakert, Holden Hirsch, Joe Klatka, Sarah Laster, Jacob McKiddy, Brett Morris, Jesse Singleton, Danielle Speckman, Matt Negron, Catherine Sadowski, AJ Womack, Eric Wulff, and Mandy Peel  
NSTA Student Chapter, University of Missouri

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116 **Tell a Conceptual Story Using the 5 E Instructional Model - Grades K-12**  
Susan German and Betsy O'Day - MS Science Teachers; Hallsville R-IV School District

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## **GENERAL SESSION I 11:40 – 12:10pm**

Hickman HS Commons – NSTA Presentation  
Jodi Peterson, Assistant Executive Director: Communications, Legislative,  
and Public Affairs, National Science  
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Hickman HS Commons – Lunch – Awards Presentation –  
**Keynote Presentation: Transitioning to Three-Dimensional Teaching: Grades K-12**  
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117 **Why YOU & Your Students NEED to be FLIPPED! - Grades 6-12**  
Barb Steel - Science Teacher/Science Department Chairperson; West St. Francois County High School

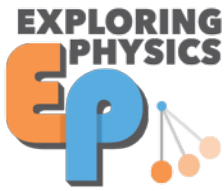
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**GENERAL SESSION III 3:30 – 4:00pm**

**Hickman HS Commons - DESE Science Updates- John Kitchens, DESE Science Consultant**

Thank you to the vendors for supporting the STOM conference.



Pearson



Please take a few minutes to visit the vendor booths located near the registration tables.