

WSST Conference 2024

E Elementary **G** General **H** High School **M** Middle School

APRIL 20 • SATURDAY

7:00am – 9:00am **Registration** Registration Desk

8:00am – 8:50am **E Developing and Using Scientific Models in the Science Classroom** Meeting C

Speakers: Pamela Richards

Models such as diagrams, drawings, physical replicas, mathematical representations, analogies, and computer simulations are helpful tools for representing ideas and developing explanations related to phenomena. This training will introduce educators to the ways in which models can be used to deepen student understanding of scientific concepts. Participants will also identify connections to the use of models in their instruction while examining their state standards and/or frameworks. We will explore how and why scientists and engineers develop and use models while experiencing how developing and using models impacts students' learning experiences.

8:00am – 8:50am **H Help students "hack" the Science ACT!** Meeting B

Speakers: Greta Voit, Kirsten Wiesneski

Participants will leave this session knowing how to: 1) use baseline ACT data to help students set goals and track growth, 2) infuse ACT instruction with the NGSS Science & Engineering Practices, 3) teach specific strategies to prepare students for the ACT Science test, and 4) access free and paid ACT-prep resources.

8:00am – 8:50am **M Increase Student Agency with Driving Question Boards** Meeting A

Speakers: Aaron Burg, Katilyn Schrader

Participants will experience the creation of a driving question board (DQB) as learners and then reflect upon the facilitation tricks required to effectively utilize this tool to frame a unit of learning. The end of the session will provide the participants time to ponder and potentially start developing an activity with which to anchor an upcoming unit. Participants will also leave with concrete suggestions of different ways to "build" the DQB to increase the likelihood of landing on a method that fits in each teacher's workflow.

Driving Question Boards have strong connections to NGSS Science and Engineering Practice 1: Asking Questions and Defining Problems and to NGSS Science and Engineering Practice 3: Planning and Carrying out Investigations. DQB are also a technique centered around creating equitable classrooms. --Working with the ChemLEAP Community out of UW Madison

8:00am – 9:50am **E Workshop: Why We Teach Science: A Micro-Retreat to Reconnect to Our Deeper Purposes for Teaching** Meeting E

Speakers: Ian Carter, Joel Donna

Here are the slides for the presentation

https://docs.google.com/presentation/d/1yX6kl7m_OpuHhbz3uKvkhM554-n_jeCD5p_00ooKhjU/edit#slide=id.g12376fbed50_0_616

This will be a highly interactive workshop with a lot of individual thinking/writing time, small group discussion, and large group discussions. The objectives are to help participants get more clear on their own personal reasons for teaching science. We will examine some common purposes for teaching aligned to the goals for NGSS and then have the participants make their own choices, share their choices on sticky notes, and then collectively share through a gallery walk.

8:00am – 9:50am	M Workshop: Introduction to Chemistry Learning Environments Anchored in Phenomena (ChemLEAP)	Meeting D
	<p><i>Speakers: Brie Bradshaw, Lindsay Wells</i></p> <p>Chemistry courses, according to the NGSS, should focus on helping students make sense of the world by connecting molecular behavior to observable events. By carefully orienting class work toward constructing and refining causal accounts for phenomena, a learning environment can bound student sensemaking and support students' use of science and engineering practices. This workshop will engage participants in reflecting on pedagogical tools and practices supportive of students' molecular-level sensemaking.</p>	
9:00am – 9:50am	E Educational Equity	Meeting C
	<p><i>Speakers: Lalitha Murali</i></p> <p>Everyone benefits when we teach and learn from a perspective of equity. Students feel seen and heard, and they are more likely to succeed both academically socially. Equity in education will allow students to use their classroom-based knowledge to identify problems, come up with solutions, and devise a way to test them. Out-of-the-box thinking and individualized education are the keys that are required for this digital age. Come and learn how a middle school teacher uses diverse materials in the classroom and is proactive in seeking out resources to help promote equity in her classroom.</p>	
9:00am – 9:50am	H Investigating properties of materials using light-matter interactions along the electromagnetic spectrum	Meeting B
	<p><i>Speakers: Sandra I. Campos-Diaz</i></p> <p>The 2023 Nobel Prize in Physics was awarded to a diverse group of scientists for their "experimental methods that generate attosecond pulses of light for the study of electron dynamics in matter." Information from these experimental methods can show the movement of electrons in chemical reactions as they are occurring. Teams in a laser lab in the Department of Physics is collaborating with a lab in the Department of Materials Science and Engineering to conduct similar studies. Engaging students in such groundbreaking studies is one way to show that scientific knowledge is an ongoing process they can be a part of.</p> <p>After participating in a Research Experience for Teachers in the laser lab at UW-Madison, I adapted a lesson using red laser pointers to measure the width of thin materials. This lesson provides an opportunity to teach about scale and measurements, a variety of knowledge obtained from light-matter interactions like the structure of DNA, and novel information like the processes of electrons movement and change in energy. The presentation will include linguistic strategies to support multilingual students. Through these strategies I argue that inclusivity is already built-in within science and engineering practices and show ways to bring them into action.</p>	
9:00am – 9:50am	H Monitoring COVID-19 in Schools	Meeting A
	<p><i>Speakers: Rachael Lancor, Ashley Mattina</i></p> <p>Through a partnership with UW-Madison, our school has been one of several test sites for monitoring COVID-19 and Influenza. In this presentation, we'll share how the air surveillance program works to detect these viral nucleic acids through and how this data is being used by the researchers and the local public health department as an indicator of virus levels in the local community. Additionally, the data collected by the air samplers can be used in the classroom to teach students about experimental design and data analysis. We'll have participants work through an activity that prompts students to think about research questions, formulating a hypothesis, identifying variables, and designing experiments. These lessons are appropriate for an introductory level biology course and can be used in a unit on physiology, infectious disease, and/or genetics.</p>	
10:00am – 10:50am	E Harnessing the Power of Simulations in Science Education	Meeting B
	<p><i>Speakers: Patty Low</i></p> <p>The integration of online simulations aligns with Science and Engineering Practices by promoting student engagement, active learning, and the development of scientific citizenship. By harnessing the power of simulations and combining them with instructional best practices, teachers can create dynamic learning experiences that empower students to ask questions, analyze data, and construct explanations. Through this interactive session, educators can explore effective strategies for leveraging simulations and fostering student engagement, ultimately nurturing the next generation of scientifically literate and engaged citizens.</p>	

10:00am – 10:50am	H Exploring Materials Science at all grade levels!	Meeting C
	<p><i>Speakers: Franklin Hobbs</i></p> <p>What is Materials Science & Engineering? Unfortunately, this is a question very few college applicants can answer. Due to this lack of clarity, across the country we see a decrease in enrollment and awareness of this fundamental discipline; a discipline that has driven technology and civilization forward since the earliest humans picked up their first rock.</p> <p>So what is it? In this talk, I will make the case that materials science is one of the most tangible and basic of scientific explorations: The study of the solid world around us. We will then dive deeper and explore how it is a blending of all the fundamental sciences that explain that world with the engineering required to manipulate and sculpt it to our whims. In pursuit of these goals, we will cross many length scales from the smallest atoms to the tallest buildings.</p> <p>Ultimately, this is call for your help. Materials science can and should be included at all grade levels and in nearly all scientific disciplines. Come explore how you can include materials discovery into your classroom. Short lesson plans, demos, and brainstormed ideas will be made available. Help us spark interest in the next generations of scientists and engineers.</p>	
10:00am – 10:50am	M Motivational Interviewing	Meeting A
	<p><i>Speakers: Darsha Olsen</i></p> <p>Boost student motivation through Motivational Interviewing - guide them to voice the case for change and amplify this in decision-making. Students sometimes engage in less-than-ideal behaviors. Move beyond advice-giving patters and help students align their behavior with their own goals and self-interest. Learn about MI, practice with some case studies, and prepare to implement Motivational Interviewing in your context. In this session, we will use resources from, "Motivational Interviewing in Schools; Conversations to Improve Learning and Behavior" by S. Rollnick, S.G. Kaplan, & R. Rutchman.</p>	
10:00am – 11:50am	E Workshop: Using Noticing, Wondering, and Connection Routines to Get Engagement and Discourse	Meeting E
	<p><i>Speakers: Chase Kern, Joel Donna</i></p> <p>Here is a link to a draft of the slides - https://docs.google.com/presentation/d/1h64HO8PeFfgE6-QTN1AEIKTCGRExyA_t/edit#slide=id.p1</p> <p>Participants will</p> <ul style="list-style-type: none"> - Identify ways they are already using discourse strategies - Learn and practice a routine that helps students access prior knowledge and lived experience and gets them talking with other students and teacher - Set the stage for learning by centering student thinking - Begin to shift pedagogy in ways that will prepare them for implementing NGSS in student-centered ways <p>There will be small group, whole group discussions, presenter modeling of the routine, and participant rehearsal of the routine.</p>	
11:00am – 11:50am	Stimulating Student's Interests in Science Using Citizen Science Projects	Meeting A
	<p><i>Speakers: Ilya Avdeev, Allison Landwehr, Kelly Voight, Dan Lesniak, Joshua Putnam, Shauna Brown, Joe Gayly, Katherine Schober, Craig Berg</i></p> <p>Science, math, and tech ed teachers developed and implemented citizen science projects with students. During these units, an issue that was important to their students was identified, data was collected and analyzed, and students learned how science and data were important to their lives.</p>	

11:00am – 11:50am

H Supporting English Learners to Access Disciplinary Literacy in a Chemistry Lesson through the Mode Continuum Meeting C*Speakers: Melissa Hemling, Julia Peterson, Ruslana Westerlund*

In this presentation we illustrate ways of supporting English learners and all students how to access disciplinary literacy of reading and writing through the Mode Continuum in a co-taught chemistry classroom. This illustration will be in a lesson where students predict properties of different molecules using VSEPR Theory to analyze Lewis structures. The Mode Continuum is an approach of scaffolding language of “here and now, you and me” to reflecting on experience, translating everyday language to technical and finally to theorizing experience. Participants will walk away with an instructional sequence to integrate into their science lessons.

HS-PS1-3 Matter and its Interactions: Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.

Scientific practice: Developing Models

Cross-Cutting Concept: Energy and Matter

<https://www.nextgenscience.org/pe/hs-ps1-3-matter-and-its-interactions>

Learning Objective for attendees: Participants will be able to apply the mode of continuum to a lesson in their own science classroom to improve the scientific understanding and literacy for all learners, including English learners.

12:00pm – 2:30pm

G WSST Spring Board Meeting

Meeting G

Speakers: Kristin Michalski, Dennis Rohr