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Celebrate

Science
& Engineering

CONFERENCE PROGRAM

MARCH 1-2, 2019 • AMWAY GRAND PLAZA HOTEL • GRAND RAPIDS, MICHIGAN



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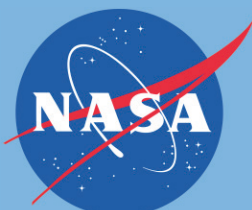
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A Message from the 2019 Conference Committee Chairs

Dear Conference Attendees,

It is with great pleasure that MSTA welcomes you to the 2019 Annual Conference where **Michigan Teachers Celebrate Science & Engineering** at the Amway Grand Plaza in Grand Rapids. The MSTA Conference is a wonderful opportunity to expand your knowledge on current topics in science education and to network with other science educators from across the state. Whether you choose to attend general sessions, workshops, field trips, or special events, there is sure to be something for everyone! Here are some highlights of what awaits you at the 66th Annual MSTA Conference.

- Over **150 sessions** will be offered throughout the day on Friday, spanning levels from early elementary through college. Be sure to look for strands supported by educators from CREATE for STEM, MABT, MAEOE, Mi-STAR, MiAAPT, MMSLN and MSELA.
- On Saturday, over **100 additional sessions** will be presented from 8:00 a.m. to 3:00 p.m.
- We welcome our keynote speakers, Jim Clark & Samantha Johnson, from Next Gen Science Innovations in California. They will be presenting **Transformative Teaching: Teachers as Agents of Change** at 9:00 a.m. on Friday in the Pantlind Ballroom. We are delighted that Jim & Samantha will share their expertise in two workshops at the Pre-Conference as well as additional sessions and workshops on Friday in the Imperial Ballroom.
- We are pleased to offer four **field trips** to those attendees who have pre-registered for experiences at:
 - Grand Rapids Community College
 - Grand Rapids Public Museum
 - John Ball Zoo
 - Van Andel Educational Institute and Van Andel Research Institute
- There will be a **movie presentation** featuring BioInteractive videos from the Howard Hughes Medical Institute from 5:15-6:15 p.m. on Friday in the Imperial Ballroom.
- Join this year's MSTA award winners at the **Awards Banquet** in the Pantlind Ballroom at 6:00 p.m. on Friday. Be awed by these inspirational educators as you hear each individual's contributions to science education in Michigan. The **Awards Reception** will precede the Gerald R. Ford Ballroom at 5:00 p.m.
- Join members of the MSTA Board in the Fine Arts Room at 9:00 a.m. on Saturday for **Muffins with Members**. Learn more about the mission and current work of MSTA and share with us what you need from your professional organization.
- On Friday and Saturday, see the largest concentration of science educational materials available anywhere in the state as you visit the **exhibitors** in the Ambassador Ballroom, Crown Foyer, West Concourse, and Central Concourse. Be sure to stop by the MSTA booth to enter the raffle drawings and purchase your new conference t-shirt.

We look forward to celebrating science & engineering with you at this year's MSTA Conference!

The 2019 Conference Committee Chairs:

Rich Bacolor	Conni Crittenden	Mike Klein	Patti Richardson
Crystal Brown	Betty Crowder	Marlenn Maicki	Sandra Yarema
Robby Cramer	April Holman	Holly McGoran	

Message from the Executive Directors

Welcome to the 66th MSTA Annual State Science Conference! On behalf of the MSTA Board of Directors and the 2019 Conference Committee, we are happy you made the commitment to attend Michigan's premier science education conference. The theme of our conference is "*Michigan Teachers Celebrate Science & Engineering*".

Michigan is three years into implementation of the Michigan Science Standards (MSS). We have designed a conference that enables science educators across our state to share strategies that support their students as they contribute to and explore three-dimensional teaching and learning. MSTA has encouraged speakers to consider how they are using Phenomena and storylines to construct their lessons based MSS/NGSS.

We have, once again, brought featured speakers, Samantha Johnson and Jim Clark, classroom master classroom teachers from California to our conference. Five and a half years into their NGSS implementation, these California state trainers will share their strategies for classroom implementation of these standards. Look for their keynote presentation; ***Transformative Teaching: Teachers as Agents of Change*** on Friday morning as well as other great workshops throughout the conference.

We encourage you to seek out sessions that will enable you to uncover ideas and resources to take back to your classroom, school, and or district.




MSTA Executive Directors

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Conference At-A-Glance

Friday, March 1, 2019

7:00 a.m. – 5:00 p.m. Pre-Registration

Location: Amway Grand Plaza Hotel, Center Concourse

7:00 a.m. – 5:00 p.m. On-site Registration/Speaker Check-In/Help Desk

Location: Amway Grand Plaza Hotel, Center Concourse

7:00 a.m. – 5:00 p.m. SCECHs Desk

Location: Amway Grand Plaza Hotel, Center Concourse

8:00 a.m. – 4:45 p.m. Sessions

Amway Grand Plaza Hotel

9:00 a.m. – 5:00 p.m. EXHIBITS

Location: Amway Grand Plaza Hotel, Ambassador Ballroom, Crown Foyer, and West Concourse

9:00 a.m. – 9:45 a.m. KEYNOTE SESSION

Transformative Teaching: Teachers as Agents of Change

Samantha Johnson and Jim Clark, NextGen Science Innovations
Location: Amway Grand Plaza Hotel, Pantlind Ballroom

10:40 a.m. – 12:30 p.m. VAN ANDEL INSTITUTE TOUR

Pre-registration was required for this field trip. Meet at the Lyon Street entrance of the Amway Grand Plaza Hotel for transportation pick-up.
Location: Van Andel Education Institute and Van Andel Research Institute

12:00 p.m. – 2:50 p.m. RAFFLE items!

Make sure to put your raffle ticket next to the item you want to win! Items in the raffle are displayed at the MSTA booth. Raffle starts at 2:50!

2:50 p.m. Friday Raffle Tickets...

Can be placed at the MSTA store until 2:50 p.m.. Winners will be drawn at 2:50 p.m. — need not be present to win. Winners will be texted and can pick up their prizes until 11:00 a.m. on Saturday.

3:00 p.m. – 5:00 p.m. GRAND RAPIDS PUBLIC MUSEUM – Watershed Lab Open House & Planetarium Show

Pre-registration was required for this field trip. Transportation not provided.
Location: Grand Rapids Public Museum

4:15 p.m. MESTA Rock Raffle!

Location: Amway Grand Plaza Hotel, West Concourse

5:15 p.m. NIGHT AT THE MOVIES!

Come see a movie presentation featuring BioInteractive videos! Enjoy refreshments and the movies provided by the Howard Hughes Medical Institute!
Location: Amway Grand Plaza Hotel, Imerial Ballroom

5:00 p.m. Awards Reception

Location: Amway Grand Plaza Hotel, Gerald R. Ford Presidential Ballroom

6:00 p.m. Awards Program

Location: Amway Grand Plaza Hotel, Pantlind Ballroom

6:00 p.m. – 8:30 p.m. HUMAN CADAVER WORKSHOP

Pre-registration was required for this field trip. Transportation not provided.

Location: Grand Rapids Community College, Calkins Science Center #343

Saturday, March 2, 2019

7:00 a.m. – 1:00 p.m. Pre-Registration

Location: Amway Grand Plaza Hotel, Center Concourse

7:00 a.m. – 1:00 p.m. On-site Registration/Speaker Check-in

Location: Amway Grand Plaza Hotel, Center Concourse

7:00 a.m. – 3:15 p.m. SCECHs Desk

Location: Amway Grand Plaza Hotel, Center Concourse

8:00 a.m. – 8:45 a.m. MUFFINS FOR MEMBERS!

Learn more about the mission and current work of MSTA and share with us what you need from your professional organization.

Location: Amway Grand Plaza Hotel, Fine Arts Room

8:00 a.m. – 2:45 p.m. Sessions

Location: Amway Grand Plaza Hotel

8:00 a.m. – Noon RAFFLE items!

Saturday raffle tickets can be placed at the MSTA bookstore until 12 noon. Winners will be drawn at 12 noon. You MUST be present to win. If Winners are not present, a new winner will be drawn immediately.

Noon MESTA Rock Raffle!

Location: Amway Grand Plaza Hotel, West Concourse

9:00 a.m. – 1:00 p.m. EXHIBITS

Location: Amway Grand Plaza Hotel, Ambassador Ballroom, Crown Foyer, West Concourse, Central Concourse

1:00 p.m. – 3:00 p.m. STEM at the Zoo

Pre-registration was required for this field trip. Transportation not provided.

Location: John Ball Zoo



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Region 14 Director

Jenny VanDaele
Region 2 Director

Sandra Yarema
Secretary

MESTA

**Amway Grand Plaza Hotel,
West Concourse**

**Friday: 9:00 a.m. – 5:00 p.m.
Saturday: 9:00 a.m. - 1:00 p.m.**

Come in and check all this fun stuff...and educational stuff too! You may need a tote bag or cart to carry away all the goodies, or better yet, a friend/colleague to help you carry it!

Rock Raffle –Jay Sinclair

Check out the extraordinary samples you could win in the famous MESTA Rock Raffle! Buy your tickets anytime Friday and Saturday for the raffles – Friday @ 4:15 p.m. and Saturday @ Noon (MUST be present to win).

Will YOU be one of the lucky winners to walk away with an amazing rock, mineral, or fossil from the famous MESTA Rock Raffle? Bring your MESTA raffle tickets on Saturday and “cross your fingers”!

Rock Shop – Parker Pennington IV

Need something to get your students excited about science? Come visit MESTA's fabulous Rock Shop! We have a variety of rocks, minerals, fossils and other oddities that will spark your student's curiosity. These purchases can be used as classroom showpieces and make great gifts. There is something for everybody. All proceeds go towards Earth Science scholarships and grants through the Michigan Earth Science Teachers Association. Major credit cards accepted.

FREE & Inexpensive – Chuck Schepke

Looking for classroom specimens of rocks and minerals for students to test and identify in labs? Come visit MESTA's Free and Inexpensive selection for affordable rocks, minerals and fossils.

www.mestarocks.org

Past Presidents

(List shown from 1994 to current. For a full list, please contact the MSTA Office at 734-973-0433).

1994/96 ___ Alex Azima	2006/08 ___ Paul Drummond
1996/98 ___ Barb Berthlesen	2008/10 ___ Betty Crowder
1998/00 ___ Robert Long	2010/12 ___ Mike Klein
2000/02 ___ Walter Rathkamp	2012/14 ___ Mike Sampson
2002/04 ___ Phil Walker	2014/16 ___ Charles Bucienski
2004/06 ___ Robby Cramer	2016/18 ___ Jennifer Arnswald

PRE-CONFERENCE SESSIONS

Thursday

Thursday, February 28, 2019

Thursday - 8:30 AM - 12: 00 PM

Assessment in a Three-Dimensional Classroom

Jim Clark, Next Gen Science Innovations; Samantha Johnson, Next Gen Science Innovations

This workshop provides a deeper dive into NGSS assessments. We will start by looking at the purpose of different types of assessments and how to design performance tasks and items for each. Participants will then receive tools to analyze the three-dimensionality of their current formative and current summative assessments and will spend time revising so they are more aligned to NGSS performance expectations. Participants will leave with sample assessments and NGSS revisions of their own!

Location: Amway Grand Plaza Hotel, Vandenberg B

Thursday - 8:30 AM - 4:00 PM

Introducing ML-PBL: NGSS- and CCSS-Focused Elementary Project-Based Learning Units

Joseph Krajcik, CREATE for STEM at MSU; Emily Miller, CREATE for STEM at MSU; Deborah Peek-Brown, CREATE for STEM at MSU; Susan Codere, CREATE for STEM at MSU;

Bring MSS/NGSS to life in your classroom. Experience ML-PBL: Project-Based NGSS-aligned curriculum/instructional units, vetted by Achieve, that engage students in making sense of phenomena and solving problems. Teachers/Leaders will have full access to two units and experience 3D learning in the context of PBL; including embedded integrated literacy and mathematics, language development, productive discourse, and SEL/Equity supports. Hear from MI teachers how ML-PBL has changed their teaching practice and reignited a love of teaching science.

Location: Amway Grand Plaza Hotel, Gerald R. Ford Ballroom

K-8 Engineering in Science? How, What, When?

Christine Cunningham, PhD, Museum of Science; Janet Kolodner, PhD, Boston College

The Framework for K-12 Science Education and the Michigan Science Standards include Engineering as part of science learning. Why is this? How do we support teachers and others as

they work to include the Engineering expectations in science classrooms, K-8? This pre-conference Leadership session will include explanations of how engineering can support science learning, what engineering means in the Framework, and what examples of high-quality engineering in K-8 might look like as it is implemented. The facilitators of this workshop are leaders in engineering education and will bring a broad perspective of the role of engineering in student learning. Join us for this pre-conference session that will challenge us to think differently.

This pre-conference session is supported by the Michigan Mathematics and Science Leadership Network and the TESLA grant, provided to the MMSLN by the Michigan Department of Education.

Location: Amway Grand Plaza Hotel, Vandenberg A

The Michigan Modeling Instruction Symposium

Mike Gallagher, Oakland Schools/MiSTEM Network

Past participants from one of the 41 summer Modeling Instruction workshops are encouraged to attend this full day symposium where the Michigan Modeling community can come together to deepen our understanding of student learning and deliberate on our efforts. We will engage with panels and keynotes who will bring us insights from their classrooms and research. We will become updated on new instructional resources and approaches that can improve our implementation of Modeling Instruction.

Location: Amway Grand Plaza Hotel, Governors Room

Thursday - 12:45pm-4:00pm

Three-Dimensional Learning... What does it look like in my classroom?

Jim Clark, Next Gen Science Innovations; Samantha Johnson, Next Gen Science Innovations

This session will assume that participants have a working knowledge of the three dimensions of NGSS, and will spend very little time reviewing what they mean, as well as what it means for a lesson to be phenomena-driven. Instead, we will be looking at knowledge in use.

Location: Amway Grand Plaza Hotel, Vandenberg B

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Friday, April 12
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Saturday, April 13
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KEYNOTE SESSION

Friday, March 1, 2019

9:00 a.m. – 9:45 a.m.

Transformative Teaching: Teachers as Agents of Change

Samantha Johnson, Next Gen Science Innovations; Jim Clark, Next Gen Science Innovations

Primary Subject: **GS**

Interest Level: **BI, CH, EN, PH, SE**

Location: **Pantlind**

How do you utilize your outside spaces for engineering challenges? The students want to move outside--and we must ensure that they will make connections with their outdoor environment. Check out these NGSS-aligned activities that will grab your students' attention as they problem-solve for some real-world outside challenges.



Samantha Johnson:

Samantha is currently teaching biology and AP biology at Arroyo High School in San Lorenzo California, where she is the coordinator for the Health and Medicine small learning community. She is the co-director of Next Gen Science Innovations, providing NGSS aligned curriculum and professional development. She is also currently working on curriculum and presenting for the Howard Hughes Medical Institute and workshops with the California Institute for Biodiversity. She was on the reading committee for the California NGSS framework, and is a frequent presenter at state-wide roll

outs, state and national conferences. She was recently named as president of the board for the California Institute for Biodiversity (Cal Alive). She has a master's degree in science education from UC Berkeley.



Jim Clark

Jim taught high school science for 32 years then spent three years as the district science coordinator for San Lorenzo Unified School District in California where he was responsible for overseeing the implementation of the Next Generation Science Standards (NGSS). He taught biology, AP biology and honors anatomy and physiology at Arroyo High School in the San Lorenzo Unified School District, for 32 years. He was the founder and director for the Academy of Health and Medicine, a small learning community at Arroyo. Among many other achievements, Jim is currently on the reading committee for the California Next Generation Science Standards framework, working with Howard Hughes Medical Institute on curriculum development, and serves as a curriculum and classroom specialist for the Knowles Science Teachers' Foundation. He is on the board of directors for the California Institute for Biodiversity where he coordinates curriculum and professional development. Jim has received international recognition for his work around growth mindset and classroom culture through KQED Mindshift. He was awarded Teacher of the Year in 2008 for Alameda County and serves on the UC Berkeley Graduate School of Education advisory board. Jim is also the co-founder of Next Generation Science Innovations (NGSI) a partnership designed to provide professional development to school districts as they move toward full implementation of the NGSS. He regularly presents at local and national conferences sponsored by the National Science Teachers Association, National Association of Biology Teachers and California Science Teachers Association.



SAVE THE DATE!!

March 5-7, 2020

MSTA 67th Annual Conference

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THANK YOU to the following! They have advertised, provided the bags for attendees, supported our “Sponsor-a-Teacher” program, provided a raffle item, or help with funds to help off-set expenses for this year’s conference! Some are here exhibiting, make sure to stop by and say “thanks”! (Booth numbers indicated by company name).

Activate Learning THORNAPPLE ROOM
Amplify BOOTH # 23
Cedar Point BOOTH #14
CMU Biological Station BOOTH # T24
DNR Outdoor Adventure Center BOOTH # TT1
Explore Learning BOOTH # 36
Grand Rapids Community College Biological Sciences
Grand Rapids Public Museum BOOTH # 40
John Ball Zoo BOOTH # T23
Imagination Station
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Lab-Aids BOOTH # 28
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Michigan Sea Grant BOOTH # T26
Michigan Virtual Conservation Club
MiniOne BOOTH # 24
Museum of Science: EiE BOOTH # TT14
National Science Teachers Association BOOTH # T34
OFFICIAL Driving School BOOTH # 26
PASCO scientific BOOTH # 17
Potter Park Zoo BOOTH # TT16/17
The Markerboard People BOOTH # 20
Van Andel Education Institute BOOTH #TT15
Wayne State University - College of Liberal Arts & Sciences BOOTH # 30

Amway Grand Plaza Hotel Meeting Rooms:

Ambassador Ballroom
Atrium Room
Berkey Room
Campau Room
Center Concourse
Crown Foyer
East Concourse
Emerald Room
Fine Arts Room
Gerald R. Ford Presidential Ballroom
Governors Room
Grand View Room
Haldane Room
Heritage Hill Room
Imperial Ballroom
Kendall Room
Lyon Room
Nelson Room
North Concourse
Ottawa Room
Pantlind Ballroom
Pearl Room
Plaza Boardroom
Pullman Room
Riverview Room
Robinson Room
Ruby Room
Vandenberg Room
Thornapple Room
West Concourse
Winchester Room

SCHEDULE YOUR DAY - FRIDAY

	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM
Atrium	Science and Art - Corpus Callosum - The Power of Collaborating with Art Teachers...MS		Engineering Design in the NGSS...MS	Phenomena-Driven Lessons for the K-8 Classroom...EE, LE, MS	
Berkey		What's So Phenomenal about Phenomena?...EE, LE, MS			
Emerald A	Great Lakes. Great Activity, Great Fun...LE, MS, HS, PH	Wildlife CSI to Teach Claim, Evidence, and Reasoning...MS, HS	The Environmental Education (EE) Project...MS, HS	The Unbearable Dilemma...LE, MS, HS, PS	
Emerald B	Go Play Outside...but Why? Nature Disconnect and Our Kids...EE, LE	Real Biology Teachers Take Kids Outside...MS, HS	How to Teach the NGSS Ecology Standards by Getting Kids Outside and Using Invasive Species...HS	Requirements for Becoming a Certified Environmental Educator...EE, LE, MS, HS, PS	
Fine Arts Room		Developing Science Process Skills Through Citizen Science & Schoolyard Investigations...LE, MS, HS		The 7E Model In the Gifted Science Classroom...MS	
Ford Ballroom	Using Phenomena to Drive Student Learning...LE, MS, HS		Consensus Meetings in Science: Making Student Thinking Visible & Incorporating Student Voice...MS, HS	Escape Rooms - Gen Z's Answer to Learning and Career Discovery...MS, HS, PS	
Governor's	Cut It, Stab It, Slice It, Dice It: Using the Potato in the Science Classroom...EE, LE, MS, HS	Integrating Computation in Science Across Computation...HS			
Grandview A	Guiding Ecological Investigations: Students Learn Science Practices and the Nature of Science...MS	Assessing 3-D Learning Using Multiple Literacies in Project-Based Learning Resources...LE		Free Teacher Resources to Support the Use of Physical and Life Science Online 3-dimensional Assessment Tasks...MS	
Grandview B/C	Swimming in Great Lakes Fisheries Science Education Opportunity...LE, MS, HS	Utilizing virtual Experiences to Teach Geography in the Elementary Classroom...EE, LE	Engineering Design in the NGSS...MS		
Haldane	Helping Students Use Systems Thinking in the Classroom and Everyday Life...MS		It Can Be Done! Easy Tools to Empower Students to Steer Their Own Learning...MS		
Heritage	Biomes and Invasive Species...HS	The Rock Cycle...MS	Photosynthesis and Respiration Shuffle...HS	NGSS Chemical Reactions: Designing Better Chemical Batteries...MS	
Imperial Ballroom	From Cookbook --> NGSS!...MS, HS	Modeling Science Practices and Standards Using Forensic Science...MS, HS, PS	Student Assessment: Standards Based Grading in a Three-Dimensional Classroom...MS, HS		
Kendall	Taking the Fear Out of Using Statistics in the Biology Classroom Using HHMI BioInteractive Resources...HS, PS		Storytelling with a Twist...EE, LE, MS, HS	Biology At the Zoo...MS, HS	
Nelson	Powerful Tools for ALL Classrooms: Question Boards, Scientific Models, and Productive Talk!...EE, LE		You Can Do It...Science in the K-2 Classroom...EE		
Ottawa	Engineering - Literally!...EE, LE	Learning Target in NGSS...EE, LE, MS, HS	The Question Formulation Technique: Teaching Students to Formulate Their Own Questions...EE, LE, MS, HS, PS	Troy School District K-5 Science Materials Adoption Process in NGSS...EE, LE	
Pantlind Ballroom	Argument-Driven Inquiry in the High School Classroom...HS	Transformative Teaching: Teachers as Agents of Change...EE, LE, MS, HS		Growing in 3D Through the PLC...EE, LE, MS, HS	
Pearl	Getting Students to Argue - Encouraging Discussion for All Students...EE, LE, MS, HS	"Talking" Science...EE, LE, MS, HS		Thinking Three-Dimensionally About Science Trade Books...EE, LE	Talking Science - sharing Ideas With Your Media Students...EE, LE
Plaza Boardroom A	Science Modeling: The Growing Pains and Gains of My First Year...MS	Human Population: Past, Present, and Future...MS, HS		Biology Modeling...HS	
Pullman		Expanding STEM: Developing Partnerships...EE, LE, MS, HS, PS	The MiSTEM Network: Supporting Michigan's STEM Future...EE, LE, MS, HS		Connecting Agriculture to NGSS...EE, LE
Riverview	Low Stakes Assessment: Provide a Low Risk Opportunity for Students to Assess Their Learning While Reducing Teacher Workload!...MS, HS, PS	Greener, Safer, Better...Chemistry Replacement Labs...MS, HS	Airbag Models: Applying Gas Laws in the Middle School Chemistry Classroom...MS		Turning Chem Labs into STEM Labs...HS
Ruby	Using Instructional Videos to Enhance Student Success in an Elementary Science Classroom...EE, LE	Making It Real...Cheap!...LE, MS		May the Force Be With You...MS, HS, PS	
Thornapple	Building a Classroom Culture Through routines...MS	Using Anchoring Phenomena and Driving Questions Boards to Spark Student Questioning...MS		Engineering the Future...HS	A Focus on Modeling in the Phenomenon-Based Classroom...MS
Vandenberg A	Science in Service...HS	Physics in for Everyone...HS		Exploring Kinetic Energy Transfers in Collisions...MS	Michigan's Electricity...MS, HS
Vandenberg B	Using Design and Build Projects to Teach NGSS Science and Engineering Practices...MS	Take Your Students Outside to Engineer!...MS, HS	Ecological Impacts - Using Place-based Stewardship to Engage Students as Citizens of Their Environment...HS		Centering Out-of-School Knowledge in STEM-based Makerspaces...MS
Winchester	The Matrix, Fully Loaded: Sharing Best Practice in the Science Classroom...EE, LE, MS, HS, PS	Supporting Early Elementary Student Talk in Science...EE		"Why Make?" A Maker Space Experience for Your Classroom...EE, LE, MS	Full STEAM Ahead...EE, LE

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 = MMSLN STRAND

= Create for STEM STRAND
 = MiAAPT STRAND
 = Mi-STAR STRAND
 = MABT STRAND

12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM
	Engaging Students in Asking Meaningful Questions...EE, LE, MS, HS	Use the NGSS Engineering Practices to Make Curriculum Decisions...EE, LE, ME, HS	From Students to Stewards – Leading Students to Plan and Enact Stewardship Action Projects...MS, HS, PS	Climate Education through Data analysis...MS, HS, PS
	Think Like an Engineer with Phenomenal Science Instruction!	Unpack 3-Dimensional Standards with Phenomenal Science Instruction		Amplify Science: Wine and cheese Reception
	Catching Up with Carp: Updates and Ideas on Incorporating Invasive Carp into Your Classroom...LE, MS, HS, PS	Science in nature Activities for Early Learners: Lessons You Can Use Tomorrow!...EE	How Do You Know What They Know? Putting the Students in Charge of Their Learning...MS, HS	Transforming Students to Stewards: Fostering Great Lakes-Literacy in Schools...EE, LE, MS, HS
	Teaching with Trees - Using Schoolyard Trees to Teach Disciplinary Core Ideas...LE, MS	Deliberating Climate Choices...MS, HS, PS	Community Engagement in the Classroom...MS, HS, PS	Nature-Based Education: Tackling the Great Outdoors with All Learners Throughout the Early Childhood School Year...EE
	You Can Teach Computer Science, Yes... You!...MS, HS	Find the Fund\$ for STEM: Grand Writing 101...EE, LE, MS, HS	Argument-Driven Inquiry in the Elementary School Classroom...LE	Silver Nanoparticles Make and Take...HS
	Cholera Case Study Reunion...MS, HS			
	Mystery of Liquids...LE, MS		Maker-space Design Thinking Challenge...EE, LE, MS	
	Getting Through the Modeling Cycle: Supporting Students in Sense-making of Phenomena in a PBL Life Science Curriculum...MS	Building Atomic Model of Matter and Conservation of Matter Concept...LE, MS, HS	NextGenPBL: Supporting Transition to MSS...EE, LE, MS, HS, PS	
	Picture Perfect Science LE...LE		Modeling Mysteries & What To Do With Them...EE, LE, MS	Make Time for Science with Project-Based Learning...EE, LE
	Mi-STAR Information Session...MS	Mi-STAR From a Teacher Perspective: Q&A with Veteran Mi-STAR Teacher...MS		Productive Talk Implementation: Year Two...EE, LE, MS, HS
	Cell Differentiation and Gene Expression...HS	Biomedical Engineering: Get a Grip!...MS	Calling All Carbons...HS	
	Asking Questions and Planning and Conducting Experiments: Using the Question Formulation Technique...EE, LE, MS, HS			
	My Favorite HHMI Biointeractive Resources for Teaching Introductory Biology...MS, HS, PS		Teaching Climate Change Standards in Biology...HS	Using (FREE) NGSS - Aligned Carbon TIME Units in MS/HS...MS, HS
	Phenomenon, Modeling, and Storyboards!...EE, LE, MS		NSTA Enhanced eBooks + Kids Collection...EE, LE	The Mars Mini-Rover Project...LE
	STEM Teaching Tools 101...EE, LE, MS, HS	Supporting District Implementation of 3-Dimensional Science...EE, LE, MS, HS	Tweaking Assessments for NGSS...EE, LE, MS, HS	
	Tools for Thinking (not Worksheets)...MS, HS	Seeing is Believing: Physics Demonstrations to Energize Your Classroom...MS, HS, PS		
	Grand Slam 3-D Assessment—Researchers, Developers, and Practitioners to Build Capacity, Develop Items, and Implement Strategically...EE, LE, MS, HS		Engaging with Administrators - Starting conversations About Supporting Science...EE, LE, MS, HS	Developing a Plan for Michigan Science Standard Implementation - K-6!...EE, LE
	PASCO Solutions: The Most Comprehensive Laboratory Experience for the Student and Educator of Today...MS, HS	The Science and Engineering of Managing Waste...LE, MS, HS, PS	The Use of Collaborative Inquiry in the Secondary Science materials Adoption Process...MS, HS	
	Getting' Googly in the Science Classroom...EE, LE, MS		Find Out More About Mber - Model Based Biology...HS	Remote Control Air Cannon & Internet of Things (IoT)- The Engineering Design Process- What We Learned at RET (Research Experience for Teachers) at CMU & How You Can Do the Same?...HS
	Structure and Function in Madagascar Hissing Cockroaches...MS	Making Good Chemistry with Industry Partnerships...LE, MS	Exploring Cosmic Gamma Rays in a High School Classroom...HS	Strategies to Promote Student engagement in Young Adults...HS, PS
	The Science of Maple Sugaring...EE, LE	Engaging with Socio-Scientific Issues Through the Media...MS, HS	Michigan's Teacher Recognition Programs...EE, LE, MS, HS	Transformed Microscopy...MS, HS, PS
	Active Programs...HS		A Focus on Constructing Written Explanations in the Phenomenon-Based Classroom...MS	
	Targeting Scientific Literacy...LS, MS	Engineerize Your Classroom: Integrate the NGSS Engineering Practices and Spice Up Your Lessons...MS, HS	Building a Model of force as an Interaction...EE, LE, MS, HS, PS	
	Science/Math Integration for a Sustainable Planet...MS, HS	Invasive Engineering...LS, MS	Using Computational Thinking Practices to Create Better Problem Solvers!...EE, LE	Using Debate to Assess Model Based Learning...HS
	How To Get K-5 Students To Use SEP and CCC...EE, LE	Earthquakes: Rock Your Student's World with NGSS!...LE	Materials Driven Inquiry...EE, LE, MS	

Interest Levels: EE = Early Elementary; LE = Late Elementary; MS = Middle Level; HS = High School; PS = Post Secondary

SCHEDULE YOUR DAY - SATURDAY

	8:00 AM	9:00 AM	10:00 AM	
Atrium	Strategies to Scaffold Science Discussion in MS Classroom...MS	Charts & Diagrams & Graphs, Oh My!...HS, PS	Particulate Drawings and Manipulatives...HS	
Berkey	Using Models and Images to Teach Shapes and Kinds of Land and Bodies of Water...EE, LE	Strengthen STEM with Community Partnerships that Integrate Arts and Social Studies...LE, MS, HS	Missed Connections: Reuniting Alternative Students with Their Environment Through a Cross-curricular Day in the Field...HS	
Emerald A	Michigan's Frogs and Toads...MS, HS	Art and Science in Nature...LE, MS		
Emerald B	Incorporating the Engineering Practices into a PH Class...HS	Hands-on and Creative Teacher-developed Invasive Species Lessons to Achieve Michigan Science Standards...EE, LE, MS	Science with a Story-line...LE, MS	
Fine Arts Room	Chemistry Teacher Meeting...HS	Muffins for Members...EE, LE, MS, HS	Incorporating Modeling Instruction with Mi-STAR...MS	
Ford Ballroom	Raising the Rigor in Your Science Classroom...MS, HS		The Genetics and Bioethics of Opioid Addiction and Treatment...MS	
Governor's	Investigation Cell Structure and Function Beyond Paper Exercises!...MS, HS, PS		What if the Graduation Requirements do not make Sense for our S...	
Grandview A	PBL, Multi-Discipline Integration, and NGSS...Oh my! Can it be done? We share how!...HS	Literacy Fun in the Science Classroom: Add Some Pizzazz!...MS, HS	Lab Reports can be Fun!...HS	
Grandview B/C	Reducing Stress and Enhancing Learning with Mindfulness...MS, HS	Ten Tips for Motivating Students with Phenomena...HS	National Geographic Geo-Inquiry Process...LE, MS	
Haldane	High School Students Can Do Astrophysics Too!...MS, HS	Claim-Evidence-Reasoning: Scientific Explanations about Phenomena...LE, MS, HS	Supporting Students' Scientific Explanations with CER...MS	
Heritage	Prospecting for Mineral Ore...HS	Chemical Formula & Amino Acids...HS		
Imperial Ballroom	Putting the Pieces Together - Biology Sequencing and Units...HS	Meaningful Moments - Project Based Learning and NGSS K-5...EE, LE	Using Phenomena to Drive Student Learning: Examples from a 5th Grade Classroom Using Next Generation Science Storylines...EE, LE, MS	
Kendall	Radical Research...MS, HS, PS	Science is a Verb, Not a Noun!...EE, LE, MS		Celebrate the 50th Anniversary of the Moon Landing!...EE, LE, MS
Nelson	Who is Birdbrain Amos and What Does He Have to Do with the Hippo and Oxpecker?...EE, LE		Using Children's Literature in Inspire STEM Learning...EE, LE	
Ottawa	Power your Classroom or School with Solar Energy - Student Driven Solar...MS, HS	Argumentation and Explanation in FOSS...EE, LE		Showcasing High School STEM Research...MS, HS
Pantlind Ballroom	Reading, Writing, Speaking & Listening in the Context of Science: Integrating Literacy & 3D Science Inst...LE, MS, HS	Bioengineering Challenges and Middle School Life Science...MS		
Pearl	The power of the NGSX Experience in My Classroom...HS	The Power of the NGSX Experience In My Classroom...HS	Making Your NGSX Workshop Pop!...EE, LE, MS, HS	
Plaza Boardroom A	Engaging Evolution Resources to Deepen Learning...MS	Sink your Teeth into Science! Using Bite Mark Evidence to Teach Lab Skills and Logic...MS, HS	Do You Want to Build a Greenhouse?...HS	
Pullman	Are you Science Woke? How to Teach Science and Integrate Culturally Relevant Education...MS, HS	Innovation Learning with The Henry Ford...LE, MS, HS	Demystifying 3D NGSS and STEM Literacy Using the Phenomenon	
Riverview	Water Quality: Developing Citizen Scientists...MS	Demonstrations That Really Grab Attention!...MS, HS, PS	Designing Destructive Earthquakes...MS, HS, PS	
Ruby	Integrating STEM with Science...MS, HS		The T in STEM...EE, LE, MS, HS	
Thornapple	Active Programs...HS		Structuring Discussion to Be Equitable and Rigorous...LE, MS, HS	
Vandenberg A	Energy Across the Content...MS, HS, PS			
Vandenberg B	Grab Their Attention with Gizmos!...MS	Empowered to Take Action: Engaging Environmental STEM Design Challenges with EarthEcho...MS, HS	Maps as Models in Earth and Environmental Classroom...MS, HS	
Winchester	Project-based STEM Challenges for Elementary Students...EE, LE	That's Phenomenal! Science Teaching with a Twist...EE, LE, MS	FOCUS: Inspiring Exploration and Discovery while Reading, Writing	

= Vendor
 = Keynote
 = DNR STRAND
 = MSELA STRAND
 = MAEOE STRAND
 = MMSLN STRAND
 = Create for STEM STRAND
 = MiAAPT STRAND
 = Mi-STAR STRAND
 = MABT STRAND

	11:00 AM	12:00 PM	01:00 PM	02:00 PM
	Head Full of STEM...LE, MS	Lesson Planning: Science Curriculum Towards Engineering Design Process...HS	Implementing the Shifts in the Next Generation Science Standards: Enacting the Sound Unit Through the Learning While Teaching Project Puts All the Pieces Together!...MS	
	Don't Reinvent the Wheel- Creating Inquiry Experiences for Students...MS, HS, PS		The NGSS Teaching Shift: Mber (Model Based Biology) Will Ignite You!!...HS	
	Flipping MEECS: Using Existing Materials in a Next Gen Classroom...LE, MS		Modeling in the Middle School Classroom...MS	NGSS-Aligned Water Quality Lessons for Middle School Grades from the Pathways to Science Teaching Program...MS, PS
		Five Phenomenon that Work in (almost) any Science Classroom...MS, HS	Stop Creating Lesson Plans: Start Creating Learning Experiences...EE, LE, MS, HS	
		Defining Temperature...EE, LE, MS, HS	Formative Assessment Using Tech Tools...EE, LE, MS, HS	
ent!...MS, HS, PS		Makerspace & STEM for Lower Elementary...EE		
r our Students?...MS, HS		Free Modeling Tools for the Michigan Science Standards...HS	Never Mind Strawberry Fields...Energy and Fields Forever...MS, HS	
	Empowering Canned Labs to Increase Ownership & Understanding of Experiments...MS, HS	STEAM Challenges: Creating Cross-curricular Events to Engage All Learners...EE, LE, MS, HS, PS	Using S.T.E.M. to Create Marble Runs...LE	
	Enhancing Curriculum and Engaging Students through Virtual Experiences...EE, LE	Increasing Student Engagement by Modifying Tasks...MS, HS	Supporting Students in the Development and Revision of Models...MS, HS	Growing Language and Science: A Garden of Effective Strategies...EE, LE
	Managing Group Talk and Teamwork...MS		Deconstructing CERs to Help Students Construct Explanations...MS	
	Writing in Science: Out of the Silo and Onto the Page...LE, MS, HS		Natural Communities of the Great Lakes: Applying NGSS to Field Based Learning...MS, HS	
	Elementary and Middle School Extravaganza...EE, LE, MS		NGSS Assessments: How will we know they are learning?...LE, MS, HS	
	How to Facilitate Student Equitable Discourse in the Classroom...LE, MS	Sustainable Schools: How to Become a Michigan Green School...EE, LE, MS, HS	Protecting Michigan Inland Lakes...MS, HS	Free-Range Students: In the Field for Obtaining, Evaluating, and Communicating Information...MS, HS
	Proven Instructional Practices in STEM: Setting ALL Students up for Success...LE	Get Out!: Taking Student Learning Outdoors...EE, LE, MS, HS	Using KLEWS and Investigation Notebooks in the Classroom!...EE, LE	Using Virtual Experiences to Teach Weather in the Elementary Classroom...EE, LE
	Coding Science Supplies! BEGINNER FRIENDLY!...MS, HS		Using Arduino-based Sensors on Nanosatellites to Engage Middle and High School Students with Science and Coding...MS, HS	Argument-Driven Inquiry in the Middle School Classroom...MS
	Gamification in the Biology Classroom...HS		Easy Tech for the Next Generation Science Standards...LE, MS, HS	
	Going Nuclear!!!!...MS, HS		Cool Demonstrations for Young Science Students Without Breaking the Bank...EE, LE, MS	Red Planet Pioneers: A Mission to Mars...LE
	Diffusion, the Cell Membrane, and Ourselves: Biology Comes Alive through the Aesthetic Realism Method...MS, HS	How Do We make Figuring Out Phenomena Central in the Classroom?...HS	How Fast Is Your Brain? Easily Introduce Neuroscience to K-12 Science Classrooms...MD, HS, PS	Global Health Got Protein...MS, HS, PS
phenon of Light...LE, MS, HS		Impacts and Benefits of Construction and Removal of Dams...LE	Modeling Dynamic Systems Using InsightMaker.com...MS, HS	
	Observations of How NGSS is Transforming Classrooms for Both Teachers and Students...EE, LE, MS, HS, PS	STEM Opportunities Beyond the Classroom...MS, HS	Grading with Purpose: My Journey to Standards Based Grading...MS, HS, PS	
	VR in Your Classroom...LE, MS, HS	Lessons Learned: The Do's and Don'ts of STEM Service Learning Projects...MS, PS	Helping Students with D=RxT...MS, HS	
S, HS			Aquaculture Challenge: Engaging Students with Fish, Plants, and So Much More!...HS	A Lecture Style Lesson Where all Students are Engaged? Yes, Please!...EE, LE, MS, HS, PS
	Understanding Fields & Energy...MS, HS	Exploring Energy Across the Disciplines...MS, HS		5 Days that Changed my Life: Coding in the Science Classroom...HS, PS
	Students Leading Change to Protest Our Waterways...EE, LE, MS, HS	Getting Students Out of Their Seats...MS, HS, PS	PASCO Solutions: The Most Comprehensive Laboratory Experience for the Student and Educator of Today...MS, HS	Promoting STEM with a STEM Society...HS
Writing, Thinking, and Doing...EE,LE		Engaging and Motivating Young Scientists!...EE	Practice the "Science and Engineering Practices" with FISH!...LE	

Interest Levels: EE = Early Elementary; LE = Late Elementary; MS = Middle Level; HS = High School; PS = Post Secondary

Friday, March 1, 2019

Michigan Science Teacher's Association

2019 Awards Program

Please join us as we celebrate to honor individuals who have been awarded Teacher or Educator of the Year. They were chosen for their use of modeling best practices, inspiring students, demonstrating innovative teaching strategies, being an excellent role model for students and other teachers, demonstrating leadership, and exhibiting a passion for science and teaching.

MSTA will be honoring:

Dan Wolz Water Education Grant Winners

- Chelsea Bender - Grand Haven High School, Grand Haven
- Carolyn Mammen - Old Mission Peninsula School

Teacher of Promise - Emily Cizmas, Lincoln Park High School, Lincoln Park

Elementary School Science Teacher of the Year - Katie Stevenson, Fisher Elementary, Redford

Middle School Science Teacher of the Year - Jeff Bouwman, Shumate Middle School, Gibraltar

High School Science Teacher of the Year - Holly Hereau, Lee M. Thurston High School, Redford

College Science Teacher of the Year - Dr. Stephen Rybczynski, Grand Valley State University, Allendale

Administrator of the Year - Dr. Adam Spina, Williamston Community Schools, Williamston

Informal Science Educator of the Year - Claire Lannoye-Hall, Detroit Zoological Society

Distinguished Service Award - Jeffrey C. Conn, Wayne State University

Mallinson Award - Dr. Jacqueline Huntoon, Michigan Technological University

2019 MSTA Awards Committee

LuAnne Clark

Conni Crittenden

Marlenn Maicki, Committee Chair

Jim McDonald

Mary Jordan McMaster

Susan Tate

SESSION DESCRIPTIONS

Friday

Friday, March 1, 2019

Friday 8:00 AM - 8:45 AM

Argument-Driven Inquiry in the High School Classroom

Victor Sampson, University of Texas at Austin

Primary Subject: **GS, CC**

Interest Level: **HS**

Location: **Pantlind Ballroom**

Learn about Argument-Driven Inquiry and how it can help high school students learn how to use core ideas, crosscutting concepts, and scientific practices to explain natural phenomena. The session includes a demonstration lab investigation.

Biomes and Invasive Species

Bill Cline, LAB-AIDS; Shannon Mareski, Grand Blanc High School

Primary Subject: **BI, AS**

Interest Level: **HS**

Location: **Heritage Room**

How do the characteristics of a biome determine the plant and animal life found there? How do non-native species survive to become invasive species? In this activity from SEPUP/LAB-AIDS Science and Global Issues Biology Curriculum, students match a set of organism cards to proper climate/biome cards, then use literacy strategies to consider the impact of invasive species. Teachers receive a full set of kit and print materials for later use.

Building a Classroom Culture Through Routines

Mary Starr, Michigan Math and Science Centers Network

Primary Subject: **GS**

Interest Level: **MS**

Location: **Thornapple Room**

Routines support students developing a culture of science learning. Asking questions, engaging in discussions, arguing from evidence, modeling and the other science and engineering practices are supported by having routines that everyone in the room knows to expect and follow. Setting up these routines and keeping them consistent can support student-centered learning.

Cut It, Stab It, Slice It, Dice It: Using the Potato in the Science Classroom

Dave Mastie, Ann Arbor Public Schools

Primary Subject: **GS**

Interest Level: **EE, LE, MS, HS**

Location: **Governor's Room**

Participants will use potatoes in hands-on activities ready for immediate classroom implementation across a wide variety of grades and contexts. For example, teachers will solve Pangaea puzzles, study stratigraphy, and draw conclusions about mass, volume and density from data provided. Additional classroom-ready activities will be demonstrated and handouts for all will be provided.

Engineering - Literally!

Cheryl Matas

Primary Subject: **SE**

Interest Level: **EE, LE**

Location: **Ottawa Room**

Looking for ways to infuse engineering into your day? Look no further! This session will engage you with children's literature that you may not think has any science and engineering in the story. Be prepared to work through the engineering practices as you come up with inventive ways to solve some problems using engineering.

From Cookbook -> NGSS!

Samantha Johnson, Next Gen Science Innovations; Jim Clark, Next Gen Science Innovations

Primary Subject: **GS**

Interest Level: **MS, HS**

Location: **Imperial Ballroom**

Participants will take some of their "oldies but goodies" and convert them to three-dimensional NGSS activities and labs. Participants should bring examples of several labs they currently do and will leave with aligned lessons ready to teach the following week!

Getting Students to Argue - Encouraging Discussion for All Students

Richard Bacolor, Wayne RESA

Primary Subject: **GS**

Interest Level: **EE, LE, MS, HS**

Location: **Pearl Room**

NGSX focuses on argumentation and explanation in science. After learning about these ideas, implementing them can sometimes be challenging. In this session we will talk with each other about how we have encouraged argumentation and explanation in our science classrooms and learn new tools and strategies for advancing argumentation and explanation. Bring your ideas and learn from others!

Go Play Outside...but Why? Nature Disconnect and our Kids

Becky Durling, Williamston Community Schools

Primary Subject: **GS, EN**

Interest Level: **EE, LE**

Location: **Emerald B**

As screen time has increased, free play in nature has decreased. Come learn what the data says about how this phenomenon is affecting our children, and how we, as educators, can help reconnect our kids to nature.

SESSION DESCRIPTIONS

Friday

8:00 am - 8:45 am continued

Great Lakes. Great Activity, Great Fun

Kevin Frailey, Michigan DNR

Primary Subject: **BI, ES, EN**

Interest Level: **LE, MS, HS, PS**

Location: Emerald A

This hands-on activity offers a fun, interactive and multidisciplinary approach to teaching about the Great Lakes watershed. Michigan landmarks, history, cultural resources, wildlife and water are all part of this engaging exercise. Try a new method to get your students (4th-12th) inspired by the largest freshwater ecosystem on earth.

Guiding Ecological Investigations: Students Learn Science Practices and the Nature of Science

Christopher Dobson

Primary Subject: **BI, IN**

Interest Level: **MS**

Location: Grandview A

Help students develop their science practices and gain an understanding of the nature of science. In this comprehensive treatment of guiding student ecological investigations I present fundamental considerations, as well as sample investigations. Handouts provided.

Low Stakes Assessment: Provide a Low Risk Opportunity for Students to Assess Their Learning While Reducing Teacher Workload!

Cindy Drake

Primary Subject: **GS, AS**

Interest Level: **MS, HS, PS**

Location: Riverview Room

Using low stakes assessments can reduce teacher workload and give feedback and test practice for students, while building their confidence. Come experience a low stakes assessment firsthand and hear about benefits to both teacher and student. Bring 1-2 typical homework assignments that you give in class and leave with 1-2 of your own low stakes assessments to take back to the classroom! This can be used by ANY discipline and ANY grade level!

Science in Service

Kathryn Gross; Daniel Geoghegan, Loyola High School, Detroit

Primary Subject: **PH, IN**

Interest Level: **HS**

Location: Vandenberg A

Engaging students by applying physics and science in service to develop a carnival for autistic children. This is one of many ways to utilize science in real world applications and obtain grant money to implement. Several science principles are discussed and hands-on activities of this event will assist you in obtaining funding, as well as developing simple projects for your science class.

Science Modeling: The Growing Pains and Gains of My First Year

Lynnelle Buchanan, East Rockford Middle School

Primary Subject: **GS**

Interest Level: **MS**

Location: Plaza Boardroom A

Have you been intrigued by the idea of science modeling in your classroom? Would you like to transition into the new NGSS-based Michigan Science Standards? After 16 years in the classroom, I completed the three week summer workshop and began my transition this year with my middle school students. I'd like to share with you about my transition and experiences.

Swimming in Great Lakes Fisheries Science Education Opportunity

Brandon Schroeder, Michigan Sea Grant / Michigan State University Extension; Tracy D'Augustino, Michigan State University Extension

Primary Subject: **EN**

Interest Level: **LE, MS, HS**

Location: Grandview B/C

Great Lakes fisheries – people, fish, and fishing – offer a wealth of ecological, social, economic AND educational values. This session explores our Great Lakes fisheries, ecosystems and issues – and ways in which they can inspire ‘feet wet’ science learning opportunities. Learn about the Sea Grant Center for Great Lakes Literacy, Great Lakes Stewardship Initiative, and Great Lakes NOAA B-WET, among other fisheries science partners and programs, training and resources available to educators to help make learning connections through fisheries science experiences.

The Matrix, Fully Loaded: Sharing Best Practice in the Science Classroom

Lucinda Martinelli, Whole Planet Consulting

Primary Subject: **GS**

Interest Level: **EE, LE, MS, HS, PS**

Location: Winchester Room

Wouldn't it be great if you could celebrate and share your best lessons with your colleagues? And wouldn't it be even better if those lessons engaged every learner? But how do you do it when planning time is short? This hands-on session will introduce you to The Matrix, a powerful tool for recording and sharing best practices and for planning across the curriculum.

Using Design and Build projects to Teach NGSS Science and Engineering Practices

Derek Maynard

Primary Subject: **GS, ES, EN, SE**

Interest Level: **MS**

Location: Vandenberg B

Participants will learn how to use project-based learning and modeling instruction philosophies to teach NGSS Science and Engineering Concepts. The presentation will focus on three design and build

SESSION DESCRIPTIONS

Friday

projects I have created and implemented for 8th grade science classes. The projects we will discuss include the design and building of an oven, a structure that can withstand a simulated earthquake and a lander that can withstand a crash landing on Mars.

Using Instructional Videos to Enhance Student Success in an Elementary Science Classroom

Catherine Hamilton, Adlai Stevenson Elementary School

Primary Subject: **GS, TE**

Interest Level: **EE, LE**

Location: **Ruby Room**

Looking to make science more engaging? Perhaps you should incorporate instructional educational videos. Learn how to post and utilize instructional videos to engage and enhance student learning.

Friday 8:00 AM - 9:45 AM

Helping Students Use Systems Thinking in the Classroom and Everyday Life

Jaime Ratliff, Lapeer Community Schools; Lindsey Watch, Mi-STAR / Michigan Technological University

Primary Subject: **GS, IN, SE**

Interest Level: **MS**

Location: **Haldane Room**

Participate in fun, three-dimensional activities that introduce systems and system models as tools scientists and engineers use to understand complicated phenomena and solve problems. System modeling is more than simply drawing pictures; experience how systems thinking empowers learners to make sense of complicated problems. Empower your students to use systems thinking both in the classroom and in their everyday lives. Classroom-tested lesson provided.

Powerful Tools for ALL classrooms: Question Boards, Scientific Models, and Productive Talk!

Jessica Ashley, Oakland Schools; Amy Bohm, Lake Orion Schools; Andrea Brook, Lake Orion Schools; Pamela Moreman, Lake Orion Schools

Primary Subject: **GS**

Interest Level: **EE, LE**

Location: **Nelson Room**

Join us for an immersion learning experience where the question board ignites class dialogue! Learn to use scientific models as a vehicle to support students as they reason with opposing ideas about problems or phenomena. Walk away with a foundation for why you shouldn't skip the question board, and what it means to develop or revise a model. Discover that the Phenomenal Science units embed these powerful tools in every unit!

Science and Art - Corpus Callosum - The Power of Collaborating with Art Teachers

Chelsea Nester, Grand Traverse Stewardship Initiative

Primary Subject: **GS, CC**

Interest Level: **MS**

Location: **Atrium Room**

Come create scientific art at this hands-on presentation! As many science teachers recognize, connection between the hemispheres of the brain surrounding a concept results in greater retention of and connection to material, and it's FUN! This is why looking at your science curriculum content through the eyes of an artist may be more engaging and long-lasting for your students. Why not work together with art teachers for the greater good of your students' learning?

Taking the Fear Out of Using Statistics in the Biology Classroom Using HHMI BioInteractive Resources

Mark Eberhard, St. Clair High School

Primary Subject: **BI, EN**

Interest Level: **HS, PS**

Location: **Kendall Room**

Participants will work with resources from HHMI BioInteractive to explore strategies and methods for integrating statistical analysis throughout their biology classes. Participants will gain confidence in working with statistics through hands-on activities that are based on active research currently taking place in biology. Through these activities, participants will explore the math behind each statistical test and learn the power offered by spreadsheets in assisting students with their statistical analysis. All resources are 100% FREE!

Session Key:

PRIMARY SUBJECT LEVELS:

AS - Assessment

CH - Chemistry

ES - Earth Science

GS - General Science

IN - Integrated Science

BI - Biology

TE - Computer Science/
Technology

EN - Environmental

Education

PH - Physics

SE - STEM Education

CC - Cross Curricular
Integration

INTEREST LEVELS:

EE - Early Elementary

LE - Late Elementary

MS - Middle Level

HS - High School

PS - Post Secondary

■ Featured Session

SESSION DESCRIPTIONS

Friday

Friday 8:00 AM - 9:45 AM continued

Using Phenomena to Drive Student Learning

Holly Hereau, Lee M. Thurston High School; Wayne Wright, Thurston High School

Primary Subject: **GS**

Interest Level: **LE, MS, HS**

Location: Ford Ballroom

The goal of real science is to be able to explain the phenomena we see in the everyday world around us. In this session we will explore what characteristics make for a great anchoring phenomenon. Come engage in and experience how students guide the learning through figuring out and sense making in a way that is coherent from the students' perspective through several investigative phenomena.

Friday 9:00 AM - 9:45 AM

Developing Science Process Skills Through Citizen Science & Schoolyard Investigations

Kathleen Dougherty, Oakland Audubon

Primary Subject: **BI, EN, IN, SE**

Interest Level: **LE, MS, HS**

Location: Fine Arts Room

Participating in citizen science provides a unique and accessible way to facilitate student science investigations. Students engaged in the Cornell Lab of Ornithology's citizen-science projects have been asking and answering their own questions about birds for more than a decade, conducting original experiments and observational studies. By engaging in citizen science and investigations, students become scientists and stewards of their local environment. They make observations, generate their own question, collect data, and get access to online datasets they can query. Students can even publish their own research conducting investigations inspired by citizen science. These are great ways to meet Next Generation Science Standards.

Expanding STEM: Developing Partnerships

Kathy Agee, Regional Math and Science Center; Carol Shaffer, Mercy Health Saint Mary's; Maria Alvarez deLopez

Primary Subject: **GS, SE**

Interest Level: **EE, LE, MS, HS, PS**

Location: Pullman Room

For the past 10 years, the Grand Valley State University Regional Math and Science Center has held sHaPe (Summer Health Activities and Professions Exploration) day camp for area middle school students. This camp is offered free of charge due to partnerships with area businesses and Mercy Health. Come hear about how the camp was developed and how we have worked with the community and schools to develop lasting public/private partnerships.

Greener, Safer, Better...Chemistry Replacement Labs

Erika Fatura, Pentwater Public Schools; Jennifer Sherburn, Hesperia High School; Jonathan Baek, Honey Creek Community School

Primary Subject: **GS, CH, SE**

Interest Level: **MS, HS**

Location: Riverview Room

Are you interested in teaching core chemistry concepts with safer materials? Join us to learn what green chemistry is and how innovative technologies can be used as tools to capture the imagination of the next generation of problem solvers. Participants will run through replacement labs with reduced risks for the middle/high school lab. Walk away with relevant open access resources and ideas for modeling phenomena that increase student engagement while increasing classroom safety.

Human Population: Past, Present and Future

Larry Feldpausch, River Raisin Institute

Primary Subject: **BI, EN**

Interest Level: **MS, HS**

Location: Plaza Boardroom A

Nobody can predict the future of humanity, but the current demographic facts of human population help us understand where we might be headed. Suggestions will be made on how your students can explore the issue of the past, present and future of mankind.

Keynote - Transformative Teaching: Teachers as Agents of Change

Samantha Johnson, Next Gen Science Innovations; Jim Clark, Next Gen Science Innovations

Primary Subject: **GS**

Interest Level: **EE, LE, MS, HS**

Location: Pantlind Ballroom

We believe that of all the reform efforts in education, the one that will result in the greatest most sustainable change is the change led by high quality, innovative teachers of passion, committed to empowering all learners in their classrooms. The challenges teachers face today are formidable, yet educators have faced formidable challenges in the past and have always, with enthusiasm, courage and great devotion been able to rise to those challenges by daring to make a difference in the lives of the children they teach. It is time for all teachers to view themselves as agents of change and become the educational leaders we need now.

Learning Target in NGSS

Heather Robotham, Wyoming Public Schools

Primary Subject: **GS**

Interest Level: **EE, LE, MS, HS**

Location: Ottawa Room

What do NGSS learning targets look like? How should they be communicated to students? We will take a look at learning targets for NGSS learning that are

SESSION DESCRIPTIONS

Friday

purposefully planned and compare them to the criteria listed for the different teacher evaluation systems.

Making It Real... Cheap!

Darrick Gregory, STARBASE- Battle Creek; Julie Hahn, Parchment Middle School; Jodi Heaney, Parchment Middle School

Primary Subject: GS, SE
Interest Level: LE, MS
Location: Ruby Room

This session will include a variety of quick and engaging phenomena that can be done for little or no cost. We will include real-world science investigations and hands on activities with cross-curricular components.

Modeling Science Practices and Standards Using Forensic Science

Kathy Mirakovits

Primary Subject: IN
Interest Level: MS, HS, PS
Location: Imperial Ballroom

Forensic Science allows students to practice real-world science. Students have to work in teams, problem solve, think critically and follow protocol. This session will highlight how to teach forensic science techniques to students and how topics fit into the NGSS wheelhouse.

Physics is for Everyone

Sandra Brough-Gresh, Walled Lake Central High School

Primary Subject: GS, PH
Interest Level: HS
Location: Vandenberg A

Meeting the needs of everyone– strategies for teaching high school physics in a co-taught setting. How do you teach high school physics to students who say they are bad at science or bad at math to find success in physics? How do you meet the needs of all of the IEP, 504, and just basic needs students from a huge spectrum of learning abilities. Come hear how using student lab notebooks, whiteboards, a rocket book, and flexibility and creativity gives student no excuses– they are in charge of their learning. Tips on managing IEPs, 504s, academically at-risk, AP students, and other general education students all in the same class. Hands on practical science- taught practically.

Real Biology Teachers Take Kids Outside

William Hodges, Holt High School

Primary Subject: BI, EN
Interest Level: MS, HS
Location: Emerald B

It is not enough to teach kids about the environment if we want them to love and protect it. We need to immerse them in it. Come learn why it is imperative that we take kids outside no matter what the obstacles, and learn how to do so safely, including identification of poison ivy and ticks.

Supporting Early Elementary Student Talk in Science

Amelia Gotwals, Michigan State University; Kirsten Edwards, Michigan State University

Primary Subject: GS, CC
Interest Level: EE
Location: Winchester Room

Young students are able to make sense of phenomena when given scaffolded opportunities. We have developed a full year of NGSS-aligned science units for kindergarten with a focus on supporting students in making sense of phenomena through talk. Each of the lessons has five parts: Ask, Explore, Read, Write, and Synthesize. We will share strategies to support students use of academically productive talk and provide sample lessons.

Take Your Students Outside to Engineer!

Christine Kelly, Allendale Middle School

Primary Subject: GS, BI, CH, EN, PH, SE
Interest Level: MS, HS
Location: Vandenberg B

How do you utilize your outside spaces for engineering challenges? The students want to move outside– and we must ensure that they will make connections with their outdoor environment. Check out these NGSS-aligned activities that will grab your students' attention as they problem-solve for some real-world outside challenges.

“Talking” Science

Katie Stevenson, Fisher Elementary School; Ashley Chiado, Fisher Elementary School; Lyndsay Mahar, Fisher Elementary School

Primary Subject: GS
Interest Level: EE, LE, MS, HS
Location: Pearl Room

Do you struggle to get your students to ask their own questions? Or respectfully “talk” about claims and evidence? At this session, you’ll learn about a new technique to get students asking questions and a way to get them engaged in conversations with their peers. Handouts provided.

Session Key:

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■ Featured Session

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VAN ANDEL INSTITUTE TOUR!

Friday, March 1 • 11 AM – Noon



Go behind the scenes at the world-renowned Van Andel Institute. Start at the **Van Andel Education Institute (VAEI)**, observing first-hand how VAEI engages K-12 students in inquiry-based science. Then, walk up the hill to **Van Andel Research Institute (VARI)** and learn about the latest cutting-edge research in Epigenetics, Cancer, Parkinson's Disease, and Metabolism. Highlights include a Dale Chihuly DNA glass sculpture, a Cryo-EM microscope, and a friendly African spurred tortoise!

Location: 216 N. Division Ave., Downtown Grand Rapids



SESSION DESCRIPTIONS

Friday

Friday 9:00 AM - 9:45 AM continued

The Rock Cycle

Bill Cline, LAB-AIDS; Lisa Kelp, Lab Aids/SEPUP

Primary Subject: **ES, SE, AS**

Interest Level: **MS**

Location: Heritage Room

Students use a model to connect the cycling of earth materials to the geological processes that result in the formation of different kinds of rock. Students also consider how the flow of energy drives various geological processes that form rock. Finally, students develop a model that describes the cause and effect relationships between geological processes and the cycling of Earth's materials. This activity provides a formal assessment opportunity for Performance Expectation MS-ESS2-1

Using Anchoring Phenomena and Driving Question Boards to Spark Student Questioning

Chris Gleason, Activate Learning

Primary Subject: **GS, SE, CC**

Interest Level: **MS**

Location: Thornapple Room

As one of the scientific practices embedded in the NGSS, asking questions and defining problems provides students with an authentic and meaningful entry point into science and engineering. Taken from "Investigating and Questioning our World through Science and Technology" (IQWST), participants will experience a puzzling chemistry phenomenon and learn how to elicit, organize, and revisit students' questions so that students feel ownership over their own learning.

Utilizing Virtual Experiences to Teach Geography in the Elementary Classroom

Eric Nephew; Mark Schlaudt

Primary Subject: **ES**

Interest Level: **EE, LE**

Location: Grandview B/C

Join the Virtual Tour Guys to see how you can bring lessons about the physical features of the Earth to life through interactive virtual experiences. Combining 360 panoramic photos and information presented through a variety of multimedia resources, we will help you engage your elementary students like never before as they learn about landforms and bodies of water.

Wildlife CSI to Teach Claim, Evidence, Reasoning

Jon Gray, Lake Orion Community Schools

Primary Subject: **GS, IN, CC**

Interest Level: **MS, HS**

Location: Emerald A

Learn how to teach CER using crime scene investigation (CSI). Scientific explanation using Claim, Evidence, and Reasoning is an NGSS Science/Engineering Practice and also one of the Core

Literacy Standards. Participants will get a chance to investigate some wildlife-related "crimes" and learn how to use them for CER instruction. Tips on how to incorporate CSI in your own classroom will be discussed. Handouts provided.

Friday 9:00 AM - 10:45 AM

Assessing 3-D Learning Using Multiple Literacies in Project-Based Learning Resources

Susan Codere, MSU CREATE for STEM; Joseph Krajcik, MSU Create for STEM; Emily Miller, MSU Create for STEM

Primary Subject: **GS, IN, AS, CC**

Interest Level: **LE**

Location: Grandview A

Explore Project-Based Learning materials for grades 3-5. Experience the power of three-dimensional learning and innovations in assessment with freely available open education resources. Our resources highlight a system of assessment including strong support for formative assessment processes, as well as summative (end-of-unit and end-of-year) assessments.

What's So Phenomenal about Phenomena?

Lawrence Hall of Science

Primary Subject: **GS**

Interest Level: **EE, LE, MS**

Location: Berkey Room

You've probably heard about phenomenon-based instruction. Figure out what this actually means and how it's embodied in an NGSS-designed curriculum. Leaders from UC Berkeley's Lawrence Hall of Science will deliver this interactive presentation to unpack the meaning of phenomenon-based instruction through sharing the Hall's research-based pedagogy and curriculum Grades: K-8

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■ Featured Session

SESSION DESCRIPTIONS

Friday

Friday 9:00 AM - 11:45 AM

Integrating Computation in Science Across Computation

Danny Caballero, Michigan State University; Paul Hamerski, Michigan State University; Paul Irving, Michigan State University; Dan Weller, Michigan State University; Nickolaus Ortiz, Michigan State University; David Stroupe, Michigan State University; Niral Shah, Michigan State University; Julie Christensen, Michigan State University

Primary Subject: PH, SE, TE

Interest Level: HS

Location: Governor's Room

Learn how teachers statewide are integrating computation into their physics classrooms. Attendees of the Summer 2018 ICSAM workshop will present on their achievements – self-designed physics-centered coding activities for their students – and finding ways to make their teaching practice more equitable. The presentation will include a teacher panel and a teacher-facilitated activity inspired by the workshop itself. Facilitators can help you get involved in the Summer 2019 workshop, for which participating teachers will be compensated.

Friday 10:00 AM - 10:45 AM

Airbag Models: Applying Gas Laws in the Middle School Chemistry Classroom

Heather Barbash, Detroit Country Day School

Primary Subject: CH

Interest Level: MS

Location: Riverview Room

Bringing “real world” applications to the middle school chemistry classroom is sometimes difficult. This brief airbag model project allows students to understand how chemists might apply gas laws in the development of automotive airbags. Students will collaboratively create and test model airbags. Emphasis is placed on design thinking and the application of concepts learned in class.

Consensus Meetings in Science: Making Student Thinking Visible & Incorporating Student Voice

Tiffany Henfling, Mason Middle School

Primary Subject: GS

Interest Level: MS, HS

Location: Ford Ballroom

The session will focus on the what, why and how of implementing interactive conversation into science classrooms. Providing a fresh way of incorporating student voice heightens engagement and promotes the idea that learning is socially mediated. Consensus meetings expose students to multiple ideas and expands their learning. A video example and consensus meeting reenactment will leave teachers prepared to launch this strategy in their own classrooms.

Ecological Impacts - Using Place-based Stewardship to Engage Students as Citizens of Their Environment

Samantha Lichtenwald, Bay-Arenac Community High School

Primary Subject: BI, ES, EN, SE, TE

Interest Level: HS

Location: Vandenberg B

An in-depth look at the impacts of our Ecology class, both for our community and our alternative students. Starting with “Where do I start?” and ending with “What now?”; I’ll discuss curriculum I chose to use, students’ perception, administrative support, community engagement, struggles, successes, and where we’ll go from here!

Engineering Design in the NGSS

Matt Moorman, TCI

Primary Subject: GS, IN, SE

Interest Level: MS

Location: Atrium Room

Participants will be immersed in a Bring Science Alive! investigation designed to reach all learners and make engineering design fun and engaging. Participants will experience this lesson from the student perspective as they take on the roles of engineers defining problems, developing solutions, and conducting iterative testing to improve their solutions.

Engineering the Future

Gary Curts, Activate Learning

Primary Subject: IN, SE

Interest Level: HS

Location: Thornapple Room

Get an inside peek at the latest edition (2018) of Engineering the Future. This curricula is composed of 4 different projects that each take 8-9 weeks for completion. This can be a stand-alone introductory engineering course, a Physical Science Foundation course, a Summer or After-School program or even a Capstone course to finish off a high school career. We will be doing an activity from one of the projects and looking closely at how the Engineering Design Cycle provides the context for all the projects. Students will further their understanding of the complementary relationships among Science, Technology, Engineering and Mathematics!!!!..... and do it in a fun way!!!

Exploring Kinetic Energy Transfers in Collisions

Chris Blackstock, Delta Education ; Kathleen Schutter, School Specialty

Primary Subject: PH

Interest Level: MS

Location: Vandenberg A

Explore how potential energy is related to kinetic energy by planning and carrying out a collision investigation. Engage as students to make sense of data to develop an understanding of energy transfers in the FOSS Next Generation Gravity and Kinetic Energy Course for middle school.

SESSION DESCRIPTIONS

Friday

How to Teach the NGSS Ecology Standards by Getting Kids Outside and Using Invasive Species

William Hodges, Holt High School

Primary Subject: **BI**

Interest Level: **HS**

Location: Emerald B

There are six ecology performance expectations for high school biology, and these can be taught by getting kids outside and examining the effect of an invasive species. An entire ecology unit, "Where did my bluebirds go?" will be presented, focusing on what invasive species do to a food web. This unit can easily be adapted to any invasive that is in your school yard or neighborhood.

Photosynthesis and Respiration Shuffle

Bill Cline, LAB-AIDS; Shannon Mareski, Grand Blanc HS

Primary Subject: **BI, TE, AS, CC**

Interest Level: **HS**

Location: Heritage Room

Students have major misconceptions about photosynthesis and cellular respiration, but this content is essential for understanding how matter and energy flows, both at the micro (cellular) and macro (ecosystem) levels. Using a computer simulation, a hands-on activity, notebooking and discussion strategies; expose student thinking- all from SEPUP's Science and Global Issues: Biology program from LAB-AIDS.

Storytelling with a Twist

Lucinda Martinelli, Whole Planet Consulting

Primary Subject: **GS**

Interest Level: **EE, LE, MS, HS**

Location: Kendall Room

Storytelling in science? Yes! In this fun interactive session, learn a strategy you can use in your classroom tomorrow to promote interest and attention in any STEM classroom. Come away with a new tool in your teacher toolbox and lots of ideas from your fellow teachers.

The Environmental Education (EE) Project

Natalie Elkins, Michigan Department of Natural Resources; Tracy Page, Michigan Department of Natural Resources

Primary Subject: **EN, SE**

Interest Level: **MS, HS**

Location: Emerald A

Join the Dept. of Natural Resources' education specialists as they model middle school and high school level STEM and inquiry activities from sources including Projects WET, WILD, Aquatic WILD, Learning Tree and the Conservation Education Toolkit.

The MiSTEM Network: Supporting Michigan's STEM Future

Kristofer Pachla

Primary Subject: **SE, CC**

Interest Level: **EE, LE, MS, HS**

Location: Pullman Room

The MiSTEM Network's 16 Regions work across the state to support K-12 STEM education and workforce. Come learn about the MiSTEM Network, how to connect, and how to utilize the network to propel your STEM education and workforce programs forward.

The Question Formulation Technique: Teaching Students to Formulate Their Own Questions

Minna Turrell, St Clair RESA

Primary Subject: **GS**

Interest Level: **EE, LE, MS, HS, PS**

Location: Ottawa Room

How can we motivate students to take ownership of their own learning? By teaching them to ask their own questions! Learn the step-by-step process for teaching students how to formulate their own questions and how to do it as a part of your regular teaching practice. Topics include how to design a Question Focus, rules for producing questions, as well as how to categorize and prioritize student questions.

Thinking Three-dimensionally About Science Trade Books

Mary Starr, Michigan Math and Science Centers Network; Katherine Pfeiffer, Plymouth Canton Community Schools

Primary Subject: **GS**

Interest Level: **EE, LE**

Location: Pearl Room

In the elementary classroom it is critical to consider how DCIs, SEPs and CCCs can be developed through excellent science reading in both fiction and non-fiction genres. In this session, a rubric for determining the usefulness of science trade books for elementary students will be described and many standards-aligned books will be shared.

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■ Featured Session

SESSION DESCRIPTIONS

Friday

Friday 10:00 AM - 10:45 AM continued

"Why Make?" A Maker Space Experience For Your Classroom

Julie Cunningham, Center for Excellence in SE; Ashley O'Neil, Center for Excellence in SE; Amanda Cornwell, Central Michigan University

Primary Subject: **SE, CC**
Interest Level: **EE, LE, MS**
Location: Winchester Room

Central Michigan University's STEM Education Scholars invite you to learn how you can easily integrate STEM education activities into your classroom. The Scholars will share ideas that may include design thinking, coding and robotics. In addition to sharing how to implement these activities, the Scholars will also discuss why these integrated ideas are beneficial for student learning.

Friday 10:00 AM - 11:45 AM

Biology Modeling

Alison Maes, Ferndale High School; Fawn Phillips, Clarkston Community Schools; Andrea Brook, Lake Orion Community Schools

Primary Subject: **BI**
Interest Level: **HS**
Location: Plaza Boardroom A

Modeling is a student-centered approach to instruction where students create, modify, and deploy scientific models. In our session, participants will utilize multiple science and engineering practices as they engage in a Biology-based modeling activity. Learn techniques used by experienced Biology modeling instructors that you can start implementing in your classroom immediately.

Growing in 3D Through the PLC

Nathan Spencer, Wayne RESA

Primary Subject: **GS**
Interest Level: **EE, LE, MS, HS**
Location: Pantlind Ballroom

The adoption of the NGSS poses multiple shifts for educators. Many of these shifts are so complex, systems and protocols must be used to make sense of it all. In this session we will dive into some of these shifts, learn ways to address them collaboratively and how to set personal goals.

It Can Be Done! Easy Tools to Empower Students to Steer Their Own Learning

Monica Wyrwicz, Rochester Community Schools; Christine Geerer, Grosse Pointe Schools; Luke Bowman, Mi-STAR

Primary Subject: **GS, IN, SE**
Interest Level: **MS**
Location: Haldane Room

How can you implement student-driven learning and still stay in the driver's seat? With your skillful facilitation and the Unit Bubble Map, you can help students make connections between their questions and the investigations they're conducting, as well as supporting them to generate new questions as they work to solve a Unit Challenge. Walk away with a toolkit from the Mi-STAR curriculum to make student-driven instruction a reality for you and your students.

May the Force Be With You

Don Pata, Grosse Pointe North High School

Primary Subject: **PH, SE**
Interest Level: **MS, HS, PS**
Location: Ruby Room

You will be moved by engaging force and motion demonstrations of classroom-ready activities including the Stunt Car Lab, the famous Monkey-Hunter "problem," and the vertical-versus-horizontal acceleration demonstration, a simple way to prove "g" is always the same.

Picture Perfect Science K-2

Jim McDonald; Katelyn Jelinek, Central Michigan University

Primary Subject: **GS, IN, CC**
Interest Level: **EE**
Location: Grandview B/C

This workshop will combine the appeal of children's picture books with standards-based science content in Grades K-2. The presentation contains STEM ready lessons, complete with student pages and assessments, that use picture books to guide science instruction in an engaging, kid-friendly way. Handouts and door prizes.

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■ Featured Session

MI Science Center

The Michigan Science Center is a 501(c)(3) nonprofit organization.

SESSION DESCRIPTIONS

Friday

Friday 10:00 AM - 11:45 AM continued

Student Assessment: Standards Based Grading in a Three-Dimensional Classroom

Samantha Johnson, Next Gen Science Innovations; Jim Clark, Next Gen Science Innovations

Primary Subject: **GS, AS**

Interest Level: **MS, HS**

Location: Imperial Ballroom

In this workshop we will explore why standards-based grading is the perfect fit for the depth of understanding required by NGSS performance expectations. During NGSS implementation, teachers will have to use their students' progress toward the performance expectations as a way to modify classroom instruction. Teachers will learn how to use multiple and varied assessments as indicators of student progress towards classroom, district and NGSS performance expectations.

You Can Do It... Science in the K-2 Classroom

Paul Drummond, Macomb ISD; Sharon Moats

Primary Subject: **BI**

Interest Level: **EE**

Location: Nelson Room

This session is intended for K-2 teachers interested in learning how to implement the NGSS standards in their classroom. Participants will experience ways to engage young learners in the science practices to make sense of phenomena. Teachers will receive a complete unit which includes a teacher's guide and student activity pages from the NGSS Storyline project.

Friday 11:00 AM - 11:45 AM

A Focus on Modeling in the Phenomenon-Based Classroom

Chris Gleason, Activate Learning

Primary Subject: **GS**

Interest Level: **MS**

Location: Thornapple Room

As one of the scientific practices embedded in the NGSS, developing and using models allow our students to imagine the unseen, make predictions, ask questions and develop further investigations. Taken from "Investigating and Questioning our World through Science and Technology" (IQWST), participants will observe an optical illusion phenomenon, then develop a model to explain how light interacts with things. Models are then shared, critiqued, and participants are guided to develop a consensus model.

Biology At the Zoo

Kristy Butler, Forest Hills Central High School; Patti Richardson, Forest Hills Central High School

Primary Subject: **BI**

Interest Level: **MS, HS**

Location: Kendall Room

Learn how we take over 300 kids to the zoo and use the animals at the zoo to learn about animal behavior, adaptations, and niche partitioning to engineer exhibits and enrichments for the animals. We will share the lessons we have created and modified over the years.

Centering Out-of-School Knowledge in STEM-based Makerspaces

Sarah Keenan-Lechel, Michigan State University

Primary Subject: **SE**

Interest Level: **MS**

Location: Vandenberg B

Three middle school girls and I conducted a youth action research project focused on investigating how, where, and why their out-of-school knowledge has informed their participation in a community and equity-oriented STEM-makerspace. I will share how their out-of-school knowledge supported their STEM-maker learning and engagement, the pedagogical and design approaches which best leverage upon these powerful forms of knowledge, and the recommendations these insights provide for other makerspaces, both in and out of school.

Connecting Agriculture to NGSS

Michelle Blodgett, Michigan Farm Bureau

Primary Subject: **GS, SE, CC**

Interest Level: **EE, LE**

Location: Pullman Room

Teachers will explore FREE agriculture lessons through our lesson matrix to enhance their daily curriculum. Lessons are NGSS aligned and reinforces grade-level standards with hands-on science opportunities while increasing students knowledge of how agriculture impacts their daily lives.

Escape Rooms - Gen Z's Answer to Learning and Career Discovery

Steve Patchin,

Primary Subject: **GS**

Interest Level: **MS, HS, PS**

Location: Ford Ballroom

Escape rooms have become a popular attraction across the world. They are real-life team-based games that consist of puzzles, riddles and activities in order to meet a goal before the clock runs out. Escape rooms provide the perfect atmosphere for students to use team building, time management and career-readiness skills all while having fun doing it. Now we have industry themes and it's mobile. Come learn tips about how to make your own

SESSION DESCRIPTIONS

Friday

Free Teacher Resources to Support the Use of Physical and Life Science Online 3-dimensional Assessment Tasks

Consuelo Morales, CREATE for STEM Institute at MSU; Phyllis Haugabook Pennock, CREATE for STEM Institute at MSU

Primary Subject: AS
Interest Level: MS
Location: Grandview A

Learn about ready-to-use free online teacher resources for middle school science classrooms. Teachers will explore the online portal containing resources to support teachers in effectively implementing a set of online NGSS-aligned 3-dimensional (Practices, DCI, and Crosscutting Concepts) physical and life science assessments and accompanying rubrics. Resources include Task Guidance, Task Rubric, Examples of Student Responses, and Suggested Student Feedback. We will also discuss classroom strategies for using the assessments and accompanying teacher supports.

Full STEAM Ahead

Kelly Swales, Dieck Elementary Swartz Creek Community Schools; Michele Bielby, Swartz Creek Schools

Primary Subject: ES, SE, CC
Interest Level: EE, LE
Location: Winchester Room

Learn how one elementary went from a STEM program to a true STEAM integrated school where NGSS standards carry over into non-academic areas. Participants will get to experience a sample hands on 3rd grade lesson of NGSS standards being extended into a non-core subject area.

Michigan's Electricity

Andrew Frisch, Farwell High School

Primary Subject: GS, CH, ES, PH, IN, SE
Interest Level: MS, HS
Location: Vandenberg A

How does electricity get to your kitchen? Where does it come from and how it is "made"? These are great questions that can be a leading question for a unit on energy and Law of Conservation of Energy. In home electricity and usage is the phenomenon that lead to all kinds of usable ideas within your classroom.

NGSS Chemical Reactions: Designing Better Chemical Batteries

Bill Cline, LAB-AIDS; Lisa Kelp, Lab Aids/SEPUP

Primary Subject: PH, IN, SE, AS
Interest Level: MS
Location: Heritage Room

Students investigate how chemical energy can be transformed via a chemical process into electrical energy. After building a prototype wet cell, students brainstorm improvements and build, test, and evaluate new prototypes to meet a set of predetermined criteria within specified constraints. Highly engaging activity from SEPUP/Lab-Aids 3rd Edition Energy Unit.

Phenomena-Driven Lessons for the K-8 Classroom

Matt Moorman, TCI

Primary Subject: IN
Interest Level: EE, LE, MS
Location: Atrium Room

In this hands-on session, we'll conduct a Bring Science Alive! investigation that gets students engaged in explaining phenomena like real-world scientists. Join TCI and leave with everything you need to implement anchoring unit phenomena and investigative lesson phenomena in your classroom.

Requirements for Becoming a Certified Environmental Educator

Cindy Fitzwilliams-Heck, Ferris State University & Michigan Alliance for Environmental and Outdoor Education

Primary Subject: BI, EN
Interest Level: EE, LE, MS, HS, PS
Location: Emerald B

Educators can earn credentials that let administrators and potential employers know they exhibit a certain level of knowledge and special skillset directly related to environmental education. Discover the requirements for earning an environmental educator certification (EEC) through the Michigan Alliance for Environmental and Outdoor Education (MAEOE). The EEC closely follows state standards and national guidelines (www.maeoe.com).

Talking Science - Sharing Ideas With Your Media Specialist

Mary Starr, Michigan Math and Science Centers Network; Katherine Pfeiffer, Plymouth Canton Community Schools

Primary Subject: GS
Interest Level: EE, LE
Location: Pearl Room

A great resource for identifying text resources for your students is the media specialist. It is important to share your needs specifically so that the media specialist can support finding three-dimensional books and other resources. In this session, we will discuss how to talk with your media specialist about materials you need for your science classroom.

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■ Featured Session

SESSION DESCRIPTIONS

Friday

Friday 11:00 AM - 11:45 AM continued

The 7E Model in the Gifted Science Classroom

Emily Kwon

Primary Subject: **GS, CH**

Interest Level: **MS**

Location: Fine Arts Room

How can cotton candy, red cabbage, or a Science Olympiad event be used to engage students? Discover why the 7E model is a powerful tool to instruct students in the science classroom. Participants in this session will experience active learning by rotating through stations, each showcasing a different phase of the 7E model. Handouts and modification suggestions for activities will be available. The activities are aligned with NGSS standards MS-PS-1 and MS-PS-5.

The Unbearable Dilemma

Kevin Frailey, Michigan DNR

Primary Subject: **BI, EN, SE**

Interest Level: **LE, MS, HS, PS**

Location: Emerald A

How did the bear cross the road? Using science, technology, engineering and math! Come learn a fun, engaging method of getting your students involved in a hands-on STEM activity that comes from a real-life wildlife management scenario.

Troy School District K-5 Science Materials Adoption Process in NGSS

Julia Alder, Troy School District

Primary Subject: **GS**

Interest Level: **EE, LE**

Location: Ottawa Room

Learn about the Troy School District plan and approach considering elementary science adoption. Artifacts from our 3-year process will be shared. Student videos, artifacts, and teacher learning experiences will be shared.

Turning Chem Labs into STEM Labs

Robert Ause, Greenhills School

Primary Subject: **CH, SE**

Interest Level: **HS**

Location: Riverview Room

Traditional chemistry labs can be turned into "STEM" labs. When students design their own set-up, statistically analyze their data and retry revised procedures, chem labs become STEM labs.

Friday 1:00 PM - 1:45 PM

Catching Up With Carp: Updates and Ideas on Incorporating Invasive Carp Into Your Classroom

Tracy Page, Michigan Department of Natural Resources

Primary Subject: **BI, EN, SE**

Interest Level: **LE, MS, HS, PS**

Location: Emerald A

Some invasive carp seem to fly through the air, while others weigh more than your students. A Great Lakes threat is on the horizon, but how do you turn a news headline into a lesson? Learn all about invasive carp and their potential invasion of the Great Lakes. What are scientists doing to prevent them from reaching Michigan, and how can we teach our students about this biological threat.

Cell Differentiation and Gene Expression

Bill Cline, LAB-AIDS; Shannon Mareski, Grand Blanc HS

Primary Subject: **BI, SE, AS**

Interest Level: **HS**

Location: Heritage Room

Students often have trouble conceptualizing how selective gene expression works. In this workshop, participants will use manipulatives to teach this concept and explain how it is connected to genetic engineering. Innovative activities are selected from our Science and Global Issues: Biology program from SEPUP AND LAB-AIDS. Activities focus on ways to integrate selective gene expression as a relevant and engaging sustainability issue.

Engaging Students in Asking Meaningful Questions

Sharon Moats; Julie Hilker, Chippewa Valley Schools

Primary Subject: **GS**

Interest Level: **EE, LE, MS, HS**

Location: Atrium Room

Let's discuss strategies to help us engage students in asking meaningful questions. Good questions based on phenomena can drive a successful storyline and help improve student engagement. Asking questions is 1 of the 8 SEPs of the NGSS. Follow up to NGSX and DQBs!

Getting Through the Modeling Cycle: Supporting Students in Sense-making of Phenomena in a PBL Life Science Curriculum

Consuelo Morales, CREATE for STEM Institute at MSU; Idit Adler, CREATE for STEM Institute at MSU; Renee Bayer, CREATE for STEM Institute at MSU; Annette M Sparks, MRY

Primary Subject: **BI**

Interest Level: **MS**

Location: Grandview A

Engaging students in developing and using models is a complex endeavor. Scaffolds (assistance to enable a learner to engage in a practice otherwise out of reach) are important to the learning process. This session bridges the gap between research and practice of teaching modeling in class. Participants will experience the challenges that students

SESSION DESCRIPTIONS

Friday

face when modeling on paper/online, and we will demonstrate the research-based scaffolds needed to support them at each step of process.

How To Get K-5 Students To Use SEP and CCC

Laura Chambless

Primary Subject: **GS**
Interest Level: **EE, LE**
Location: Winchester Room

Teachers and students both need a better understand of the SEP and CCC in order to teach and learn in 3-D. In this session you will be given a set of each SEP and CCC cards. They were developed for teachers to have a better understanding on how to put the Framework into action. Both sets of cards come with how to use them in the classroom, helpful information on unpacking the Framework, and key instructional strategies to use in your classrooms.

Mi-STAR Information Session

Monica Wyrwicz, Rochester Community Schools;
Stephanie Tubman, Michigan Tech / Mi-STAR; Yonee Bryant-Kuiphoff, Linden Grove Middle School

Primary Subject: **GS, IN, SE**
Interest Level: **MS**
Location: Haldane Room

Interested in getting the Mi-STAR curriculum and professional learning implemented in your school or district? Attend this session to discover what the Mi-STAR grades 6-8 science and engineering program offers, talk with a veteran teacher and program staff, and learn the simple steps to get your school or district up and running with Mi-STAR.

PASCO Solutions: The Most Comprehensive Laboratory Experience for the Student and Educator of Today

Julie Thomas, PASCO scientific

Primary Subject: **BI, CH, EN, PH, IN**
Interest Level: **MS, HS**
Location: Plaza Boardroom A

Learn about the new tiered levels of PASCO solutions complete with classroom management and technology rolled into one. See how you can easily implement PASCO curriculum solutions, kits, or equipment in your classroom, and conveniently store your equipment in accessible carts and trays. You've spoken, and we've listened: see PASCO's new SPARKvue 4.0 software. The solution that connects ALL sensors on ALL devices so that your students have the most pedagogically congruent, enriched classroom experience.

Science/Math Integration for a Sustainable Planet

Amanda Syers, GVSU Center for Educational Partnerships;
Janet Vail, GVSU Annis Water Resources Institute

Primary Subject: **EN, SE, CC**
Interest Level: **MS, HS**
Location: Vandenberg B

Discover hands-on activities on real-world human ecology concepts (population growth, natural resource

use and biodiversity) while building foundational math skills. In this session, participate in innovative activities including creating representational models with manipulatives, cooperative group problem-solving challenges, graphing and analysis, and role-playing simulations. Receive activity instructions, data charts and background reading in an electronic format, all matched to state standards.

STEM Teaching Tools 101

Connie Kennedy, Bay City Public Schools; Megan Coonan, Saginaw ISD

Primary Subject: **GS, SE**
Interest Level: **EE, LE, MS, HS**
Location: Ottawa Room

Are you someone responsible for facilitating science conversation back in your district? All over the country, STEM Teaching Tools have been used to support professional development sessions. The STEM Teaching Tools site has tools that can help you teach science, technology, engineering and math (STEM). Come find out about these OER resources that PD facilitators can access for FREE—including slides, speaker notes, facilitator guide, and embedded resources.

Structure and Function in Madagascar Hissing Cockroaches

Chris Blackstock, Delta Education; Kathleen Schutter, School Specialty

Primary Subject: **BI**
Interest Level: **MS**
Location: Riverview Room

Explore the phenomenon of structure and function with live Madagascar hissing cockroaches. Discover how students engage in three-dimensional learning as they explore and compare systems in multicellular organisms in the FOSS Next Generation Diversity of Life Course for middle school.

Session Key:

PRIMARY SUBJECT LEVELS:

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■ Featured Session

SESSION DESCRIPTIONS

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Friday 1:00 PM - 1:45 PM continued

Targeting Scientific Literacy

Karen Kudla, Oxford Community Schools

Primary Subject: **GS, AS**

Interest Level: **LE, MS**

Location: Vandenberg A

Scientific Literacy is clearly in the bull's eye of science education. The Michigan Science Standards, based on the NGSS, use 3 dimensional learning to improve student knowing and understanding of science. The new Science M-Step is being developed to assess scientific literacy of our students. This session explains what scientific literacy is and gives practical strategies for teachers to use that promote and assess scientific literacy in their classroom.

Teaching With Trees - Using Schoolyard Trees to Teach Disciplinary Core Ideas

Bridget Booth, St. Thomas Aquinas School / MAEOE

Primary Subject: **IN**

Interest Level: **LE, MS**

Location: Emerald B

Looking for ways to integrate place-based education and outdoor instruction into your curriculum? Go to the trees! Learn how to use the natural phenomena trees provide to teach disciplinary core ideas covering biology, chemistry, ecology, climate and energy. Resources, games and data collection strategies will be shared to help you design a year-long tree study for your students that will introduce them to phenology, encourage connection and foster observation skills. Take science class outside!

The Science of Maple Sugaring

Janet Staal, West Side Christian School

Primary Subject: **IN, SE, CC**

Interest Level: **EE, LE**

Location: Ruby Room

Collecting maple sap is a green, environmentally sustainable process. You can utilize your schoolyard or nearby healthy, mature maple trees to integrate science practice skills. We will demonstrate integrated NGSS-based activities along with citizen science opportunities you can conduct with students in your schoolyard. Discover ways you can use trees and nature as a lens for developing self-motivated science learners.

Think Like an Engineer with Phenomenal Science Instruction!

Tom Gantt, Amplify

Primary Subject: **GS**

Interest Level:

Location: Berkey Room

Teachers will learn how student driven engineering internships can incorporate all aspects of the new Science & Engineering Practices from the Michigan Science Standards. This session will engage educators with hands-on activities, digital tools, active

reading and dynamic discussion with the purpose of integrating phenomena-based science instruction around real-world problem solving.

Tools for Thinking (not Worksheets)

Christie Morrison Thomas, Michigan State University;
Emily Pohlonski, Novi Community Schools

Primary Subject: **BI, ES, IN**

Interest Level: **MS, HS**

Location: Pantlind Ballroom

See how (free) Carbon TIME life and earth science units scaffold students' 3-dimensional performances including constructing explanations & engaging in arguments from evidence. Hear how Process Tools in these 6 phenomena-centered units have been extended into other content and courses, including NGSS-aligned genetics & evolution units.

You Can Teach Computer Science, Yes... You!!

Larry Wyn, Mecosta-Osceola ISD; Kathy Surd, West Central STEM Region

Primary Subject: **TE**

Interest Level: **MS, HS**

Location: Fine Arts Room

Come learn how to get involved with the Code.org team from Michigan and get the training you need to teach an AP Computer Science Principles (high school) or Computer Science Discoveries (middle school) course in your school. You don't even need any computer science background.

Friday 1:00 PM - 2:45 PM

Active Programs

Gary Curts, Activate Learning

Primary Subject: **CH, ES, PH**

Interest Level: **HS**

Location: Thornapple Room

A look inside the Active Curricula - How do Active Physics, Active Chemistry and EarthComm support NGSS and Engineering? Get a close up, active look at this curricula. Experience a couple of activities and see for yourself how getting your students actively engaged in doing science promotes life-long learning. These three curricula are used around the world and have a great track record for ensuring student success and involvement in learning and applying science.

Cholera Case Study Reunion

Lisa Weise, Holt Public Schools

Primary Subject: **BI, SE**

Interest Level: **MS, HS**

Location: Ford Ballroom

Using a case study approach to teaching Biology started with a partnership between some teachers at Holt and MSU. This case study, using a cholera

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epidemic from the 1800s has been widely shared and modified over the past 30 years. This session provides a venue for people to share how they have changed the case study over the years. We will share some modifications from our school including an updated connection to the cholera outbreak in Haiti following a hurricane in 2010. Teachers who are not familiar with the case study will have time to ask questions and are encouraged to attend.

Gettin' Googly in the Science Classroom

Cheryl Matas

Primary Subject: TE
Interest Level: EE, LE, MS
Location: Pullman Room

Are you new to Google in The Classroom? This is the session for you. We cover the basics and how to use Google Docs in your NGSS lessons and projects. You'll learn some nifty new features and tricks you can start using right away to increase engagement in your science activities. Bring along your laptop or tablet so you can follow along with this fast paced, information packed session.

Grand Slam 3-D Assessment—Researchers, Developers, and Practitioners to Build Capacity, Develop Items, and Implement Strategically

Mary Starr, Michigan Math and Science Centers Network; TJ Smolek, Michigan Department of Education

Primary Subject: GS, AS
Interest Level: EE, LE, MS, HS
Location: Pearl Room

Find out how to use statewide assessment examples to identify and evaluate the use of three-dimensional components for grades 5, 8, and 11 assessments.

My Favorite HHMI BioInteractive Resources for Teaching Introductory Biology

Mark Eberhard, St. Clair High School

Primary Subject: BI, EN
Interest Level: MS, HS, PS
Location: Kendall Room

I often hear from teachers how much they love HHMI BioInteractive resources but navigating the website to choose which resources to use can be overwhelming. Frequently, I have been asked by participants, how do I know which resources I should use? Based on my 30+ years in the classroom, I will engage participants in hands-on experiences with the HHMI resources that I have personally found to be highly effective with my introductory biology course.

Mystery of Liquids

Claire Lannoye-Hall, Detroit Zoological Society; Akilah Franklin, Detroit Zoological Society

Primary Subject: CC
Interest Level: LE, MS
Location: Governor's Room

Ever wonder how to set up an investigation with everyday materials and tools? Join me/us to explore a mystery set of clear liquids, using questions and investigations to discover which liquid is which!

Phenomenon, Modeling, and Storyboards!

Nancy Karre, Cereal City Science by Battle Creek Area Mathematics and Science Center; Steve Barry, Cereal City Science by Battle Creek Area Mathematics and Science Center

Primary Subject: GS, IN, SE, CC
Interest Level: EE, LE, MS
Location: Nelson Room

Experience a phenomenon-based lesson that takes learners from wondering, to exploring, to making thinking visible, to developing a story that tracks their progression of learning. Take away tools and ideas that help your students think and act like scientists and engineers. Participants recognize how Science and Engineering Practices and Crosscutting Concepts are integral in the lesson. The experience can be applied to any lesson when there is engaging phenomena that makes one wonder.

Picture Perfect Science LE

Jim McDonald; Katelyn Jelinek, Central Michigan University

Primary Subject: GS, IN, SE, CC
Interest Level: LE
Location: Grandview B/C

This workshop will combine the appeal of children's picture books with standards-based science content in Grades 3-5. The presentation contains STEM ready lessons, complete with student pages and assessments, that use picture books to guide science instruction in an engaging, kid-friendly way. Handouts and door prizes.

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■ Featured Session



**WHEN YOU PLANT THE
SEED OF CONSERVATION,
YOU NEVER KNOW WHAT
MIGHT GROW.**

**ARE YOU INTERESTED IN AN ALL-EXPENSES-PAID HABITAT
IMPROVEMENT DAY ON PUBLIC LAND NEAR YOU FOR YOUR STUDENTS?**

Email MUCC Education Director Shaun McKeon at smckeon@mucc.org

SESSION DESCRIPTIONS

Friday

Friday 1:00 PM - 4:45 PM

Asking Questions and Planning and Conducting Experiments: Using the Question Formulation Technique

Samantha Johnson, Next Gen Science Innovations; Jim Clark, Next Gen Science Innovations

Primary Subject: **GS**

Interest Level: **EE, LE, MS, HS**

Location: *Imperial Ballroom*

In this workshop, participants will engage in an activity called the question formulation technique. QFT is designed to shift the focus from teachers asking questions to students asking questions. Participants will learn how to structure the process of students planning and carrying out an investigation or conducting research using their own question. This session addresses several of the science and engineering practices, and participants will leave with lesson plans they can teach on Monday!

Friday 2:00 PM - 2:45 PM

Biomedical Engineering: Get a Grip!

Bill Cline, LAB-AIDS; Lisa Kelp, Lab Aids/SEPUP

Primary Subject: **SE, AS, CC**

Interest Level: **MS**

Location: *Heritage Room*

Students use the approach of biomimicry to design, test, evaluate, and redesign a mechanical gripping device to meet criteria. They use the engineering design process to optimize the device in one of two ways. In doing so, they investigate the relationship between structure and function of the device and how the technology they developed can be applied. This provides an opportunity to assess students on MS-ETS 1-4.

Building Atomic Model of Matter and Conservation of Matter Concept

Kristin Mayer, East Kentwood High School

Primary Subject: **BI, CH, ES, EN, PH, IN, SE, CC**

Interest Level: **LE, MS, HS**

Location: *Grandview A*

As one of the crosscutting concepts in NGSS, matter and energy is a foundational idea built on in all disciplines. Are students really developing an understanding of this concept that they can apply throughout their science classes? I will share several activities I use to build the concept of atomic nature of matter and conservation of matter and view sample student work to see how these activities help students develop these foundational concepts.

Deliberating Climate Choices

Misty Klotz, Kellogg Biological Station; Sean R. Griffin, W.K. Kellogg Biological Station, MSU

Primary Subject: **EN**

Interest Level: **MS, HS, PS**

Location: *Emerald B*

Deliberating Climate Choices: We will learn how to moderate a forum with students that fosters productive discussion on Climate issues. We will use Environmental Issues Forum (EIF) Climate Choices guide and where to access free materials and moderator guides for educators to integrate into their learning environments.

Earthquakes: Rock Your Student's World with NGSS!

Cris DeWolf, Chippewa Hills High School/MESTA; Lisa DeWolf

Primary Subject: **ES, SE**

Interest Level: **LE**

Location: *Winchester Room*

Focusing on NGSS standard 4-ESS3-2, participants build and test earthquake resistant structures in a make-and-take session. We will also share information about the MIQuakes educational seismograph network and jAmaSeis, free software available to live stream remote seismographs on your classroom computer.

Engaging with Socio-Scientific Issues Through the Media

Kirsten Edwards, Michigan State University; Carly Seeterlin, Michigan State University

Primary Subject: **GS, CC**

Interest Level: **MS, HS**

Location: *Ruby Room*

The ability to read and evaluate texts on socio-scientific issues is a key component of scientific literacy, particularly in the era of fake news. This ability is also part of the Next Generation Science Standards' science practice of obtaining, evaluating, and communicating information. This session for secondary science teachers will provide teachers with resources and a lesson structure to support students in reading and responding to texts written for a public audience on socio-scientific issues.

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■ Featured Session

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Friday 2:00 PM - 2:45 PM continued

Engineerize Your Classroom: Integrate the NGSS Engineering Practices and Spice Up Your Lessons

Kate Hojnacki, Fraser High School

Primary Subject: **GS, SE**

Interest Level: **MS, HS**

Location: Vandenberg A

What is Engineering? How can making simple changes to a lesson make it an engineering adventure? How does it promote new NGSS standards and practices? Embark on a hands-on experience constructing understanding of how the NGSS engineering practices are not only applicable, but vital to a 21st century classroom.

Find the Fund\$ for STEM: Grant Writing 101

June Teisan

Primary Subject: **GS, CC**

Interest Level: **EE, LE, MS, HS**

Location: Fine Arts Room

Do you have Cartier dreams for your classroom but a dollar store budget? Get tips and tricks for grant writing that can help you craft proposals to fund robust science learning—for your students and for YOU!

Invasive Engineering

Jessica Wagenmaker, MEECS

Primary Subject: **EN, SE**

Interest Level: **LE, MS**

Location: Vandenberg B

Participants will be introduced to a lesson on invasive species that uses the Engineering Design Process to solve a problem. This hands on presentation allows participants to experience the lesson from start to finish.

Making Good Chemistry with Industry Partnerships

John Dulmes, Michigan CH Council

Primary Subject: **CH, SE**

Interest Level: **LE, MS**

Location: Riverview Room

Many teachers and students are unaware that Michigan has some of the leading chemistry companies in the world, many of whom have active outreach programs and are eager to work with you. These industry resources and partnerships can help bring to life the principles of chemistry through real-world applications, drive home the many chemistry career opportunities, and facilitate classroom presenters or even tours of local chemistry labs and plants.

Science in Nature Activities for Early Learners: Lessons You Can Use Tomorrow!

Becky Durling, Williamston Community Schools; Natalie Elkins, Michigan Department of Natural Resources

Primary Subject: **GS, EN**

Interest Level: **EE**

Location: Emerald A

Do you need a lesson for your elementary class to use tomorrow? Are you searching for a way to get your students outside exploring nature! Then have we got ideas to share with you!

Supporting District Implementation of 3-Dimensional Science

Richard Bacolor, Wayne RESA

Primary Subject: **GS**

Interest Level: **EE, LE, MS, HS**

Location: Ottawa Room

WRSA science consultants combined the NGSS District Implementation Indicators from Achieve and a theory of change model to monitor and support the vision of 3-Dimensional science. Presenters will share the development and use of this tool for setting long and short-term goals with various stakeholders.

The Science and Engineering of Managing Waste

Kathleen Klein, Waste Management, Inc.

Primary Subject: **CC**

Interest Level: **LE, MS, HS, PS**

Location: Plaza Boardroom A

Powerpoint presentation of relevant information that will encourage a discussion of how STEM is critical in this important industry for educating students about the industry, career opportunities - all critical to our sustainability as a society.

Unpack 3-Dimensional Standards with Phenomenal Science Instruction

Tom Gantt, Amplify

Primary Subject: **GS**

Interest Level:

Location: Berkey Room

Teachers will learn how phenomena-based science instruction designed around real-world problem solving can incorporate all aspects of the Michigan Science Standards. Teachers will unravel the Disciplinary Core Ideas, Science and Engineering Practices, and Crosscutting Concepts in how they relate to science curriculum design. This session will engage educators with hands-on activities, digital tools, active reading and dynamic discussion with the purpose to design instruction with 3-Dimensional Statements.

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Use the NGSS Engineering Practices to Make Curriculum Decisions

Christine Geerer, Grosse Pointe Schools

Primary Subject: **GS**

Interest Level: **EE, LE, MS, HS**

Location: Atrium Room

Engineering isn't just for building stuff! Engineering practices provide a fair and logical way to evaluate a wide variety of solutions - like which curriculum to adopt. Come learn how we used criteria, constraints, and a Mi-STAR decision matrix to move forward in our district curriculum review process - and embedded some PD at the same time.

Friday 2:00 PM - 3:45 PM

Mi-STAR From a Teacher Perspective: Q&A with Veteran Mi-STAR Teachers

Dawn Kahler, Kalamazoo Public Schools; Monica Wyrwicz, Rochester Public Schools; Stephanie Tubman; Yonee Bryant-Kuiphoff

Primary Subject: **GS, IN, SE**

Interest Level: **MS**

Location: Haldane Room

Explore the Mi-STAR curriculum from the perspective of teachers who have experience writing, piloting, and facilitating for the program. Teachers and project staff will be there to listen, answer your questions, and increase your comfort level. Are you an experienced teacher? Please come and share your perspective, too!

Seeing is Believing: Physics Demonstrations to Energize Your Classroom

Don Pata, Grosse Pointe North High School

Primary Subject: **PH, SE**

Interest Level: **MS, HS, PS**

Location: Pantlind Ballroom

What are the best demos for your classroom? In this new workshop, we have selected the most effective combination of demonstrations to help you illustrate a wide variety of physics concepts, including Newton's laws of force and motion, light, sound, waves, and color science. Enhance your science lessons by bringing real-life examples immediately into the classroom.

Friday 3:00 PM - 3:45 PM

Argument-Driven Inquiry in the Elementary School Classroom

Victor Sampson, University of Texas at Austin

Primary Subject: **GS, CC**

Interest Level: **LE**

Location: Fine Arts Room

Learn about Argument-Driven Inquiry and how it can help students in grades 3-5 learn how to use core ideas, crosscutting concepts, and scientific practices to explain natural phenomena. The session includes a demonstration lab investigation.

Calling All Carbons

Bill Cline, LAB-AIDS

Primary Subject: **ES, EN, SE, AS**

Interest Level: **HS**

Location: Heritage Room

The element of carbon is critical to life on Earth. All living organisms contain different and essential carbon-based molecules. Several Earth processes work together to cycle carbon from one carbon reservoir to another and to keep the amount in each reservoir stable. This is an activity from EDC Earth Science. Participants will model and learn about and model different carbon transfer processes.

Community Engagement in the Classroom

Misty Klotz, Kellogg Biological Station; Sean R. Griffin, W.K. Kellogg Biological Station, MSU

Primary Subject: **GS**

Interest Level: **MS, HS, PS**

Location: Emerald B

Community Engagement in the Classroom: We will look at ways to discuss community needs and engage in community-focused projects with your students. This hands-on session will familiarize participants with the North America Association for Environmental Education (NAAEE) Community Engagement Guidelines.

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■ Featured Session

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Friday 3:00 PM - 3:45 PM continued

Engaging with Administrators - Starting Conversations About Supporting Science

Sandra Brock, Northville Public Schools

Primary Subject: **GS**

Interest Level: **EE, LE, MS, HS**

Location: Pearl Room

In this session, a district administrator will provide a short overview of how her district has tackled the science standards shifts, piloting materials, and identifying student learning outcomes. A critical part of this session is the opportunity to bring your questions about how to successfully engage administrators (specifically principals) to increase the focus on science teaching, provide additional professional learning time, and expand resources.

Exploring Cosmic Gamma Rays in a High School Classroom

Katelyn McCarthy

Primary Subject: **PH**

Interest Level: **HS**

Location: Riverview Room

Gamma rays are typically not extensively studied in the classroom due to their high energies and the difficulty involved in detecting/observing them. Students can work with current research data from the High-Altitude Water Cherenkov (HAWC) Gamma-Ray Observatory project to become citizen scientists and explore cosmic gamma rays. This presentation will provide hands-on opportunities to work with some of the lesson activities and walk away with an engaging 5E lesson.

Find Out More About Mber - Model Based Biology

Diane Buchi, Utica Community Schools; Bryant Sebastian, Utica Community Schools

Primary Subject: **BI**

Interest Level: **HS**

Location: Pullman Room

A survey of the year-long educational resource developed by Cindy Passmore and her team from UC-Davis. What does modeling look like in biology! Stop by and find out!

From Students to Stewards - Leading Students to Plan and Enact Stewardship Action Projects

Holly Hereau, Lee M. Thurston High School

Primary Subject: **GS, BI, EN**

Interest Level: **MS, HS, PS**

Location: Atrium Room

The Dan Wolz Clean Water Education grant provided the support to allow students to plan a pollinator/rain garden that will also act as an outdoor learning lab and a place where all students can visit for field experiences. We used the Earth Force framework to ensure student agency and engagement as well as the elements of Storyline development to keep students employed as the sense-makers. I will identify and provide information about other citizen science

and stewardship opportunities used to compliment student learning as well as other organizations that provided professional development and/or financial support. Participants will walk away with a complete "how-to" guide for implementing a similar project or place-based learning experience.

How do you Know What They Know? Putting the Students in Charge of Their Learning

Sandra Brough-Gresh, Walled Lake Central High School

Primary Subject: **GS, AS**

Interest Level: **MS, HS**

Location: Emerald A

How do you know what your students know? How can you access whether or not to move forward or reteach or reexplain? What do you do if some get it and others don't? Come see how to use simple techniques and strategies and recycled "goodies" to make their thinking visible for on the go formative assessment. Ideas on making better use of your time AND actually saving time by putting the students in charge of assessing their own learning and aiding in the learning of their peers.

Michigan's Teacher Recognition Programs

Josh Roesner, Michigan Department of Education

Primary Subject: **GS**

Interest Level: **EE, LE, MS, HS**

Location: Ruby Room

Sharing information on teacher recognition programs coordinated through the Michigan Department of Education, including Michigan Teacher of the Year and the MI Teacher Leadership Advisory Council (MTLAC), Presidential Awards for Math and Science Teaching (PAEMST), The Innovative Educator Corps, and more!

Modeling Mysteries & What To Do With Them

Katie Stevenson, Fisher Elementary School; Jill Workman, Pierce Elementary

Primary Subject: **GS**

Interest Level: **EE, LE, MS**

Location: Grandview B/C

What is a model and what does it look like when teaching NGSS? Come see student examples of modeling phenomenon in elementary and middle school classrooms. We will show you how we use these to drive instruction and assess what our students are thinking. Handouts provided.

NSTA Enhanced eBooks+ Kids Collection

Laura Chambless, St. Clair County RESA; Jennifer Evans, St. Clair County RESA

Primary Subject: **GS**

Interest Level: **EE, LE**

Location: Nelson Room

Come learn and play with the new NSTA Enhanced eBooks+ Kids Collection. This session is presented by the the authors Laura Chambless and Jennifer Evans. Laura is a Math/Science consultant and Jennifer is

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an ELA consultant, both from St. Clair County RESA. You will get to see their first book *What Makes Them Special?*, based on the performance expectation 1-LS1-1: Structure and Function of Plants and Animals. They will share their experience of becoming authors with NSTA, and you will get to see other books available. <http://www.nsta.org/publications/press/ebooks-kids.aspx>

Teaching Climate Change Standards in Biology

Craig Kohn, Linden Grove Middle School; Christie Morrison Thomas, Michigan State University

Primary Subject: **BI, ES, IN**

Interest Level: **HS**

Location: Kendall Room

Wondering where and how to address the NGSS climate change standards? Our student learning research indicates these are culminating performance goals, best tackled after students trace matter and energy through living systems. Our free Carbon TIME units are designed specifically to support you and your Biology students in mastering these complex climate change standards. Engage with our Human Energy Systems unit, including formative assessment probes and online simulations.

Using Computational Thinking Practices to Create Better Problem Solvers!

Jessica Ashley, Oakland Schools; Michele Harris, Ferndale Upper Elementary; Katlyn LeMere, Roosevelt Elementary

Primary Subject: **GS, TE, CC**

Interest Level: **EE, LE**

Location: Vandenberg B

Join us to explore how four computational thinking practices promote systems thinking and perseverance in ALL subject areas! Learn how to use these practices with students so that they become better problem solvers by noticing patterns, breaking down big problems, focusing on only important information, and 'debugging'. We'll share what we've learned so far in our research by being intentional about the use of computational thinking to deepen understanding of science concepts. Resources will be shared from the CT4EDU, NSF grant.

Friday 3:00 PM - 4:45 PM

A Focus on Constructing Written Explanations in the Phenomenon-Based Classroom

Chris Gleason, Activate Learning

Primary Subject: **GS**

Interest Level: **MS**

Location: Thornapple Room

As one of the scientific practices embedded in the NGSS, constructing explanations and designing solutions is the ultimate goal of science and engineering, respectively. Engaging students in writing formal scientific explanations often requires

scaffolding, however. Taken from Investigating and Questioning our World through Science and Technology (IQWST®), participants will learn how to implement the Claim-Evidence-Reasoning (CER) framework to help their students know how to write scientifically.

Building a Model of Force as an Interaction

Laura Sloma, East Kentwood High School

Primary Subject: **GS, ES, PH, IN, SE, CC**

Interest Level: **EE, LE, MS, HS, PS**

Location: Vandenberg A

How do we help students develop and use models? Join us as we explore how to facilitate model development through building a robust force model. This session will help teachers build and develop their own force model while we explore how facilitate students in their model development. This is geared toward ANY teacher who teaches the Forces and Interactions topic bundle K-1.2!

Maker-space Design Thinking Challenge

Julie Cunningham, Center for Excellence in SE; Ashley O'Neil, Center for Excellence in SE; Amanda Cornwell, Central Michigan University

Primary Subject: **SE, CC**

Interest Level: **EE, LE, MS**

Location: Governor's Room

Participate in a Design Thinking Challenge that will help you integrate STEM in your classroom with the CMU Center for Excellence in STEM Education. Walk away with the ability to implement a Design Thinking Challenge in your classroom and learn more about the programs the Center offers to educators.

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Friday 3:00 PM - 4:45 PM continued

Materials Driven Inquiry

Claire Lannoye-Hall, Detroit Zoological Society; Sandy Ling, Detroit Zoological Society

Primary Subject: **GS, ES**

Interest Level: **EE, LE, MS**

Location: Winchester Room

Your students need to move and explore, they need to connect with nature. You want them to slow down, make observations, ask meaningful questions and plan investigations. Join us/me in this hands-on workshop to use everyday classrooms to accomplish all this, and more.

NextGenPBL: Supporting Transition to MSS

Angela Kolonich, CREATE for STEM Institute

Primary Subject: **GS**

Interest Level: **EE, LE, MS, HS, PS**

Location: Grandview A

For administrators, curriculum coordinators, teacher leaders, and teachers. This session will explore what MSS classrooms look like and common pitfalls teachers have in early implementation. Emphasis will be supporting teachers and administrators in understanding the shift, and how schools and districts can work together to realize the vision of MSS. This session includes multiple iterations of collaborative discussion, so come ready to share ideas!

The use of Collaborative Inquiry in the Secondary Science Materials Adoption Process

Kathleen Rainey, Troy School District; David Michael Egan, Troy School District

Primary Subject: **GS**

Interest Level: **MS, HS**

Location: Plaza Boardroom A

Join us as we share our experiences using a Collaborative Inquiry framework in our secondary science materials review and adoption process. We will share how we established a common vision, set our focus on gathering student artifacts and evidence of NGSS in action and built consensus with teachers. We will share student artifacts, rubrics, process outlines and teacher feedback and learning experiences.

Tweaking Assessments for NGSS

Wendi Vogel, Kent Intermediate School District; Sarah Coleman, MAISD

Primary Subject: **AS**

Interest Level: **EE, LE, MS, HS**

Location: Ottawa Room

Have assessments? Need assessments? NGSS-aligned, summative assessments are not easy to write. Walk away from this session with a method to tweak current assessments or create new science summative assessments in the future. Bring current assessments and a device to access the Framework for K-12 Science Education if you have one (they are not needed).

Friday 4:00 PM - 4:45 PM

Climate Education Through Data Analysis

Dave Chapman, Okemos High School

Primary Subject: **ES, EN, IN**

Interest Level: **MS, HS, PS**

Location: Atrium Room

This session will present a lesson where students consider a phenomenon and analyzing data to construct a conclusion. The phenomenon here will be global temperature increase. Alternative hypotheses evaluated include variation of solar output, changing Earth orbit and tilt, and increased greenhouse effect. Some data will include ocean sediment fossils and sunspots. A variety of climate education resources will also be shared.

Developing a Plan for Michigan Science Standard Implementation - K-6!

Cassandra Martin

Primary Subject: **GS**

Interest Level: **EE, LE**

Location: Pearl Room

Join us as we explore a case of one school's implementation of the science standards in a K-6 environment. Discussion will follow a description of the implementation strategies, successes and challenges of high-quality science learning!

Make Time for Science with Project-Based Learning

Dawn McCotter, Van Andel Education Institute

Primary Subject: **GS, CC**

Interest Level: **EE, LE**

Location: Grandview B/C

If we treat content areas as silos, we'll never find time for Science! Discover how to create authentic experiences that increase student engagement, develop critical and creative thinking skills, and connect across content areas. Be the teacher that transforms everyday lesson plans into memorable learning experiences. Come with a willingness to try something new; leave with project ideas that engage students not only in learning, but in making their world a better place!

Nature-Based Education: Tackling the Great Outdoors with All Learners Throughout the Early Childhood School Year

Amanda Gort, Neway Nature Preschool; Amy Hall, Neway Nature Preschool; Nicole Force, Neway Nature Preschool

Primary Subject: **GS**

Interest Level: **EE**

Location: Emerald B

Take a walk through the four seasons and learn how to excite and include the youngest learners. Walk with us to see what has been working, how we do it and brainstorm ways you can too. Come find out why nature education is for all learners!

SESSION DESCRIPTIONS

Friday

Productive Talk Implementation: Year Two

Kelly MacDonell, Vicksburg Community Schools; Katie MacDonell

Primary Subject: GS

Interest Level: EE, LE, MS, HS

Location: Haldane Room

Tips and tricks for using Productive Talk in the K-12 classroom. Recommended for teachers in the second year of implementation.

Remote Control Air Cannon and Internet of Things (IoT) - The Engineering Design Process- What we Learned at RET (Research Experience for Teachers) at Central Michigan University and how you can do the Same?

Pete Peterson, Shelby High School; Allison Abram

Primary Subject: SE

Interest Level: HS

Location: Pullman Room

Engineering is a growing field with many job opportunities. Learn to teach your students to think like engineers by incorporating the Engineering Design Process into your lessons. Presenters will share their experiences working with engineering faculty and students at CMU and how they've taken this into the classroom.

Silver Nanoparticles Make and Take

Larry Kolopajlo, Eastern Michigan University; Mariah Ford, Eastern Michigan University

Primary Subject: CH, EN, IN

Interest Level: HS

Location: Fine Arts Room

Participants will prepare silver nanoparticles using green tea, and then investigate their properties using lasers and uv/vis spectrophotometry. The pros and cons of using Ag NPs in consumer products will be surveyed. With regard to NGSS, these learning dimensions are addressed: DCIs: structure and properties of matter, chemical reactions; SEP: Design solutions to everyday problems; CCCs: biology, medicine, chemistry, physics.

Strategies to Promote Student Engagement in Young Adults

Leslie Cieplechowicz

Primary Subject: GS

Interest Level: HS, PS

Location: Riverview Room

One of the challenges of teaching young adults is to garner student participation. Strategies will be provided to encourage classroom involvement by all students.

The Mars Mini-Rover Project

Crystal Brown, Gibraltar School District

Primary Subject: SE

Interest Level: LE

Location: Nelson Room

When upper elementary students tackle this Project-based STEM challenge, they'll be using Newton's

laws of motion, their understanding of properties of matter and density of molecules, surface area and angles, the transformation of electrical energy into motion, and their knowledge of circuits. This project is the perfect opportunity for students to use science and engineering practices while building, testing, and improving a working mini-rover prototype into prototype Martian crater. Get ready kids! NASA is calling and they need your help! A full detailed unit plan with digital student and teacher resources will be provided.

Transformed Microscopy

Bob Myers, West Ottawa High School

Primary Subject: BI, IN, SE, TE

Interest Level: MS, HS, PS

Location: Ruby Room

Transform microscopy lessons from "look and draw" to truly quantifiable inquiry. Use of super cheap digital cameras or even cell phone cameras will be demonstrated. This will be a hands-on experience, bring your own USB enabled device.

Transforming Students to Stewards: Fostering Great Lakes-Literacy in Schools

Rashell Bowerman, MDE; Megan Schrauben, MiSTEM; Emily Gochis, MiSTEM; Rachel Coale, Michigan Office of the Great Lakes; Kevin St. Onge, MiSTEM Network; Emily Finnell, Office of the Great Lakes, DNR

Primary Subject: SE

Interest Level: EE, LE, MS, HS

Location: Emerald A

This discussion will demonstrate strategies and best practices to incorporate Great Lakes and Water Literacy principles into classrooms, teacher training, and STEM/STEAM education. We will discuss a developing RFP to support learning in the context of freshwater education. Place-based education and existing curricula will be discussed to support laying a foundation for solving critical water issues, with a goal of informing a pilot project.

Session Key:

PRIMARY SUBJECT LEVELS:

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■ Featured Session

SESSION DESCRIPTIONS

Friday/Saturday

Friday 4:00 PM - 4:45 PM continued

Using Debate to Assess Model Based Learning

Edward Johns, Cedar Springs High School; Steve Vree, Cedar Springs High School; Heidi Schuitema, Cedar Springs High School

Primary Subject: **BI, AS, CC**

Interest Level: **HS**

Location: *Ford Ballroom*

Model Based Biology (MBER) and AMTA biology introduce the characteristics of life at the beginning of the school year. Our biology team used a structured debate, centered around whether viruses are living or non-living, to assess our students at the end of this unit. This was done after students developed a model of what it means for something to be a living thing. The outcomes of the debate FAR exceeded our expectations! We will share snapshots of this experience with our students, and a lengthy pile of positive outcomes that went quite beyond our vision for this activity.

Using (free) NGSS-Aligned Carbon TIME units in MS/HS

Christie Morrison Thomas, Michigan State University

Primary Subject: **BI, ES, IN**

Interest Level: **MS, HS**

Location: *Kendall Room*

Carbon TIME (Transformations in Matter and Energy) offers six phenomena-based units tracing matter & energy through carbon-transforming processes including photosynthesis & cellular respiration. Research-based scaffolds support students' 3-dimensional performances and educative features support teachers' engagement with classroom discourse and 3-D assessment. Join us to learn about and use these fully developed units in your classroom and/or district.

Friday 4:00 PM - 5:30 PM

Amplify Science: Wine and Cheese Reception

Lawrence Hall of Science

Primary Subject: **GS**

Interest Level:

Location: *Berkey Room*

Learn about Amplify Science at your own pace and time. This come-and-go session will give you a more detailed view into Amplify's science program developed for the NGSS by the Lawrence Hall of Science. You will gain access to a demo account and have the opportunity to ask questions about the program and its implementation and see first-hand how Amplify Science can help your students think like scientists!

Friday 5:15 p.m. - 6:15 p.m.

Night at the Movies

Location: *Imperial Ballroom*

Come see an engaging movie presentation featuring BioInteractive videos (available to use free in science classrooms). Enjoy refreshments and the movies provided by the Howard Hughes Medical Institute.

Saturday, March 2, 2019

Saturday 8:00 AM - 8:45 AM

Are you Science Woke? How to Teach Science and Integrate Culturally Relevant Education

Duha Fahmy

Primary Subject: **BI, CH, EN, SE, CC**

Interest Level: **MS, HS**

Location: *Pullman Room*

"Why are we learning this?" "How am I going to use this in real life?" "What's the purpose of this?" Every teacher has heard these notoriously infamous phrases and it's about time we put an end to it by awakening the sleeping giant. So, get woke...Science woke! Learn simple tips and tricks to embed Culturally Relevant Education and Phenomenon Science in your unit plans and experience wide spread 'Eureka Moments'!

Chemistry Teacher Meeting

Mary Jordan McMaster, Allen Park High School

Primary Subject: **CH**

Interest Level: **HS**

Location: *Fine Arts Room*

Come meet other Chemistry Teachers from around Michigan. This is a great way to make connections for those who teach in schools with a small science department. Chemistry teachers across the state are our greatest professional resource! Most of us have been working hard to implement the Michigan Science Standards, bring a great idea to share or a question to ask.

Engaging Evolution Resources to Deepen Learning

Cheryl Hatch, Kalamazoo Area Math & Science Center

Primary Subject: **BI**

Interest Level: **MS**

Location: *Plaza Boardroom A*

Come explore interactive evolution resources to get your middle school students making sense of evolution concepts through use of hands-on manipulatives.

SESSION DESCRIPTIONS

Saturday

Grab Their Attention with Gizmos!

Diana Markley, Stevenson Middle School; Julie Parks, Stevenson Middle School

Primary Subject: **IN, SE, TE**

Interest Level: **MS**

Location: Vandenberg B

Gizmos are a sure-fire student engagement strategy. Students perform virtual experiments, collect and analyze data, and take ownership of their own learning. We want to share our success after 4 years of working with this amazing program.

High School Students Can Do Astrophysics Too!

Katelyn McCarthy

Primary Subject: **GS, PH**

Interest Level: **MS, HS**

Location: Haldane Room

Through the use of a DIY \$5 particle detector, students can observe subatomic particles. With extension activities diving into biology, chemistry, earth and space science, students explore the radiative world around us. This presentation will provide hands-on opportunities to work with some of the lesson activities and walk away with an engaging 5E lesson.

Incorporating the Engineering Practices into a Physics Class

Kevin Stedman, St. Louis Public Schools

Primary Subject: **PH, SE**

Interest Level: **HS**

Location: Emerald B

Hear how I have incorporated the engineering practices into my physics classroom this year. My journey began this summer when I was able to participate in the Research Experience for Teachers. Through collaboration with other educators, we developed engineering activities and lessons to implement in our classrooms. I will share the successes and challenges encountered during this journey to deeper levels of understanding for my students.

Michigan's Frogs and Toads

Larry Feldpausch, River Raisin Institute

Primary Subject: **BI, EN**

Interest Level: **MS, HS**

Location: Emerald A

Get the scoop on the when, where and how citizen scientists across Michigan have been surveying our thirteen frog and toad species for twenty-three years. You too can participate in the effort.

PBL, Multi-Discipline Integration, and NGSS...Oh my! Can it be done? We share how!

Paula Gentile, Tecumseh High School

Primary Subject: **BI, SE, CC**

Interest Level: **HS**

Location: Grandview A

We share our journey through restructuring a life science course to include interdisciplinary content, skills, and experiences while simultaneously immersing learners in phenomenon-based coursework and multi-dimensional projects. This tale is far from perfect and involves a great deal of collaboration, teamwork, and innovation (not to mention trial-and-error); but, the adventure is entirely worth it! Join us for ideas and inspiration!

Power Your Classroom or School with Solar Energy - Student Driven Solar

Joshua Barclay, West Bloomfield High School

Primary Subject: **EN, PH, IN, SE, CC**

Interest Level: **MS, HS**

Location: Ottawa Room

Students at West Bloomfield High School were able to power their entire science department with solar energy! Students themselves did the energy audits, solar resource studies, determination of cost savings and pollution prevention, fundraising, grant writing, presenting to the school board and more, culminating in the student-assisted construction of a 20 kilowatt solar array, which now powers the entire WBHS Science Department! We want to show you how we did it, so you can too!

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■ Featured Session

SESSION DESCRIPTIONS

Saturday

Saturday 8:00 AM - 8:45 AM continued

Project-based STEM Challenges for Elementary Students

Crystal Brown, Gibraltar School District

Primary Subject: **SE**

Interest Level: **EE, LE**

Location: Winchester Room

STEM projects in elementary school provide students with the perfect opportunity to see a real world application of science, technology, engineering and math. Come learn about 3 Project-based STEM projects designed to challenge your elementary students and provide a rich experience with the engineering design process! The Cantilever Challenge will have your students talking about balanced forces and mass, fulcrum, levers, center of gravity and equations. The Mars Aqueduct project is guaranteed to challenge students as they try to design and improve the best way to move water down to the 'fields on Mars.' Your lower elementary students will be challenged to think more deeply of material properties and observe their tests as they engineer an animal shelter. Links and resources for teachers and students will be provided. Leave with 3 lessons for Monday!

Prospecting for Mineral Ore

Bill Cline, LAB-AIDS

Primary Subject: **ES, EN, AS**

Interest Level: **HS**

Location: Heritage Room

How do geologists look for mineral ore? In this activity from EDC Earth Science, participants search for a layer of rock that contains a valuable mineral called molybdenum by testing sediments collected in strategic spots along river systems gathering data to decide where the deposit is located. This is no 'cookie mining' activity!

Putting the Pieces Together-Biology Sequencing and Units

Lara Gusty; Stephanie Niedermeyer, Wayne Memorial High School

Primary Subject: **BI**

Interest Level: **HS**

Location: Imperial Ballroom

This session will provide a possible sequence to create a Biology curriculum based on NGSS. We'll share the breakdown of our units in the sequence and inquiry-based lessons embedded in each unit.

Radical Research

Kristy Butler, Forest Hills Central High School; Patti Richardson, Forest Hills Central High School

Primary Subject: **GS, BI, IN, SE**

Interest Level: **MS, HS, PS**

Location: Kendall Room

Join us as we share how students are acting as scientists by conducting individual independent research projects in class. Students will research

something that they are interested in, plan their investigation and write a "journal worthy" paper and present their findings. Students demonstrate their content knowledge and SEP skills. Learn about this authentic project-based learning experience. Resources provided!

Reading, Writing, Speaking and Listening in the Context of Science: Integrating Literacy and 3D Science Instruction

Victor Sampson, University of Texas at Austin

Primary Subject: **GS, CC**

Interest Level: **LE, MS, HS**

Location: Pantlind Ballroom

Literacy is an integral part of science. From pre-school to professional astrophysics, a person's ability to read, write, speak, and listen in the context of science heavily influences their path to scientific literacy. K-12 instruction should include strategies for the authentic integration of literacy skills in the science classroom. Participants in this session will be introduced to Argument-Driven Inquiry, an instructional model that integrates 3D science instruction and literacy skills.

Reducing Stress and Enhancing Learning with Mindfulness

Wendy Johnson, Kentwood Public Schools

Primary Subject: **GS**

Interest Level: **MS, HS**

Location: Grandview B/C

Students and teachers are more stressed than ever, yet we are expected to help all students achieve rigorous performance expectations. Practicing mindfulness reduces stress and enhances learning by helping both teachers and students to notice the thoughts, emotions, and patterns of behavior we bring to the classroom. I will share practical tools and strategies I am using in my high school biology class to integrate mindfulness into daily routines, learning activities, and classroom management.

Strategies to Scaffold Science Discussion in MS Classroom

Amie J Snapke, Ann Arbor Public Schools; Margaret Raupp, Forsythe MS; Mary Buckwalter, Forsythe MS

Primary Subject: **GS**

Interest Level: **MS**

Location: Atrium Room

We know our middle school students are experts at talking but how do we get them to talk science? This presentation will involve a variety of techniques and scaffolds to help your middle school scientists talk science in the classroom! You will walk away with some tools you can try in your classroom next week!

SESSION DESCRIPTIONS

Saturday

The Power of the NGSX Experience in my Classroom

Wayne Wright, Thurston High School

Primary Subject: **CH, GS**

Interest Level: **HS**

Location: Pearl Room

Over 6000 Michigan teachers have experienced the NGSX study group professional learning experience. If you been part of this experience, come learn more about what others are doing and share your ideas. If you have thought about attending a study group in your region, come learn more about how it might change your practice! This session will specifically highlight applications of NGSX in the high school classroom!

Using Models and Images to Teach Shapes and Kinds of Land and Bodies of Water

Stephen Mattox, Grand Valley State University; Tori Fowler

Primary Subject: **ES**

Interest Level: **EE, LE**

Location: Berkley Room

Focusing on 2-ESS2-2, participants will explore google maps, 3D models, and national, regional, state and county maps to identify land and bodies of water in an area.

Water Quality: Developing Citizen Scientists

Jackie Murray, Clinton Community Schools

Primary Subject: **GS, EN, IN, SE**

Interest Level: **MS**

Location: Riverview Room

Students become citizen scientists each year when we conduct water quality testing in our local river. Results are communicated to our area, and we upload our data to an international database.

Saturday 8:00 AM - 9:45 AM

Active Programs

Gary Curts, Activate Learning

Primary Subject: **CH, ES, PH**

Interest Level: **HS**

Location: Thornapple Room

A look inside the Active Curricula - How do Active Physics, Active Chemistry and EarthComm support NGSS and Engineering? Get a close up, active look at this curricula. Experience a couple of activities and see for yourself how getting your students actively engaged in doing science promotes life-long learning. These three curricula are used around the world and have a great track record for ensuring student success and involvement in learning and applying science.

Integrating STEM with Science

Marian Prince, Andrews University

Primary Subject: **IN, SE, TE**

Interest Level: **MS, HS**

Location: Ruby Room

The TI-Innovator Hub gives many opportunities to integrate NGSS, STEM, and coding in a science class. This session will investigate how students can create an alarm that can be used to protect a pet left in a car, how to make a mood ring, and how to pick a good seat at a concert while learning about thermodynamics, light and color, and the properties of sound. Beginners welcome.

Investigating Cell Structure and Function Beyond Paper Exercises!

Tamica Stubbs, Bio-Rad Laboratories

Primary Subject: **BI, SE**

Interest Level: **MS, HS, PS**

Location: Governor's Room

In this workshop, participants will exploit specialized structures and functions of animal, plant and bacterial cells to develop customized DNA extraction protocols from. Using CER, and animal/student DNA extracts as controls, participants will capitalize on DNA's popularity to develop exploratory wet labs that increase interest and appreciation of cell diversity.

Raising the Rigor in Your Science Classroom

Cassey Tien; Mari Maltby

Primary Subject: **AS**

Interest Level: **MS, HS**

Location: Ford Ballroom

This workshop will be an interactive lesson on increasing the rigor through talk moves and writing assessments with more depth. Individuals who are interested should bring a current copy of any assessment that they would want to develop to more closely relate to the questioning found on the SAT and MSTEP.

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■ Featured Session

SESSION DESCRIPTIONS

Saturday

Saturday 8:00 AM - 9:45 AM continued

Who is Birdbrain Amos and What Does he Have to do with the Hippo and Oxpecker?

Nancy Karre, Cereal City Science by Battle Creek Area Mathematics and Science Center; Steve Barry, Cereal City Science by Battle Creek Area Mathematics and Science Center

Primary Subject: **SE, CC**

Interest Level: **EE, LE**

Location: Nelson Room

Come listen to a story about a hippopotamus and his tick bird while you explore matter and energy flow in an ecosystem. Cereal City Science (CCS) by BCAMSC has developed science units with phenomena, modeling, storyline, and CCSS integrations. Are you just squeezing science into lesson plans? Experience how ELA/Science integration can be fun, engaging, and increase skills and understanding. Dive into CCS new units and experience the benefit of well thought out science/ELA integration.

Saturday 8:00 AM - 10:45 AM

Energy Across the Content

Don Pata, Grosse Pointe North High School

Primary Subject: **GS, BI, CH, ES, EN, PH, IN, SE, CC**

Interest Level: **MS, HS, PS**

Location: Vandenberg A

What is Energy? In all of our science classes; Biology, Chemistry, Physics, Earth Science, etc. we all teach about energy. However, if we're honest with ourselves we don't really have a good, working definition of energy. More importantly we don't have a shared concept of energy. How are we supposed to help the students develop a coherent energy concept if we don't even have one among science teachers? Join us for a session where we will explore the ways in which energy is treated in the different disciplines and see if we can't get a start on a group understanding of energy.

Saturday 9:00 AM -9:45 AM

Argumentation and Explanation in FOSS

Chris Blackstock, Delta Education; Kathleen Schutter, School Specialty

Primary Subject: **GS**

Interest Level: **EE, LE**

Location: Ottawa Room

Investigate phenomena and experience how elementary students create models, construct explanations, and engage in argumentation from evidence in FOSS lessons. Explore how these NGSS science and engineering practices complement and reinforce each other to enhance student learning. Leave with instructional strategies to support student sensemaking.

Charts & Diagrams & Graphs, Oh My!

Alice Putti, Jenison High School; Jamie Benigna, Roper School

Primary Subject: **CH**

Interest Level: **HS, PS**

Location: Atrium Room

Science Practices 1 and 5 in the revised AP Chemistry Curriculum focus on various representations for interpreting data and communicating knowledge of relevant chemical concepts. This session will review representations students are expected to interpret when they take the exam, including sample assessment items. Student handouts and other review strategies for the exam will be provided.

Chemical Formula & Amino Acids

Bill Cline, LAB-AIDS

Primary Subject: **CH, AS**

Interest Level: **HS**

Location: Heritage Room

What is the difference between subscripts and coefficients? What does "balancing" a chemical equation mean? Many students have trouble with these fundamental concepts in chemistry. If a student does not fully understand the chemical formula, then moles, reactions, and stoichiometry are hopelessly confusing. Join us for some engaging, intuitive, and well-differentiated lessons that allow students of all levels to master the chemical formula and thereby move confidently into a deeper understanding of chemistry.

Claim-Evidence-Reasoning: Scientific Explanations About Phenomena

Pam O'Brien, STEMscopes

Primary Subject: **GS**

Interest Level: **LE, MS, HS**

Location: Haldane Room

CER is a way for students to explain observed phenomenon in a scientific way and how observations and data from an investigation are connected to science knowledge. This acclaimed and highly successful instructional strategy is changing how lab instructions are conducted and making science investigations meaningful for students. ELD strategies will be shared and modeled for an equitable learning environment.

Demonstrations That Really Grab Attention!

Mark Sheler, Sandusky Jr/Sr High School

Primary Subject: **GS, CH, ES, EN, PH, IN**

Interest Level: **MS, HS, PS**

Location: Riverview Room

20 awesome phenomena anyone can create on a tight budget. Get ideas to spunk up your delivery and engage your students. Science is never boring when you have the right hook. All linked to NGSS phenomena, you will be able to take home many ideas in physical science. Most are 7-12 ideas.

SESSION DESCRIPTIONS

Saturday

Hands-on and Creative Teacher-developed Invasive Species Lessons to Achieve Michigan Science Standards

Jessica Wagenmaker, MEECS; Jeffrey Ram, Wayne State Univ/Belle Isle Aquarium; Sara Forbing, Caro Community Schools; Maria Siciliano, Detroit Public Schools

Primary Subject: **BI, EN, SE, CC**

Interest Level: **EE, LE, MS**

Location: Emerald B

Hands-on and creative lessons about invasive species are used both to engage student learning and to protect the environment. More than 15 teachers submitted lesson plans for online posting. We will demonstrate activities from several lessons, including students creating video public service announcements, producing informative Power Points, and engineering electric barriers to aquatic invaders. Lesson plans are posted on the web and linked to standards for science, social studies, and English language arts.

Empowered to Take Action: Engaging Environmental STEM Design Challenges with EarthEcho

Susan Tate, Whitehall Middle School

Primary Subject: **EN, SE**

Interest Level: **MS, HS**

Location: Vandenberg B

EarthEcho International was founded by Philippe Cousteau Jr. on the belief that youth have the power to change our planet. As an expedition fellow, I saw firsthand this organization's commitment to equipping teachers with lessons and online tools that marry the best of the engineering design process with the tenets of environmental place-based learning. Come explore with me as we take a deep dive into their Water By Design and just-released PlasticSeas curriculum.

Innovation Learning with The Henry Ford

Olivia Marsh, The Henry Ford; Rob O'Leary, The Henry Ford

Primary Subject: **GS, SE, CC**

Interest Level: **LE, MS, HS**

Location: Pullman Room

This presentation will outline The Henry Ford's innovation learning initiatives for teachers. Join us to learn how you can integrate THF's interdisciplinary learning framework, Model I in your classroom. You'll also learn about the 2019 Michigan Invention Convention on April 27 and how you and your students in grades 3-12 can get involved!

Literacy Fun in the Science Classroom: Add Some Pizzazz!

Melissa Buck-Underwood, Duncan Lake Middle School; Michelle Krentz, Kraft Meadows MS, Caledonia Community Schools

Primary Subject: **GS, AS, CC**

Interest Level: **MS, HS**

Location: Grandview A

Take away ready-to-use literacy strategies frequently used by the presenters to improve reading

comprehension, preview, review and formatively assess. Tap into your students' creative sides! Strategies are versatile for various content areas. Each is easy to prepare for use.

Meaningful Moments - Project Based Learning and NGSS K-5

Amy Quinn, West Bloomfield School District

Primary Subject: **IN, SE, CC**

Interest Level: **EE, LE**

Location: Imperial Ballroom

Get ready to see examples of PBL (Project Based Learning) in action! Topics discussed will include how PBL supports NGSS, anchoring phenomena, collaborative creative thinking, science engineering standards and real-world connections. Projects shown will be from k-5 West Bloomfield school district classrooms.

Muffins for Members

Betty Crowder, MST A; Brian Peterson, MST A; Robby Cramer, MST A

Primary Subject: **GS**

Interest Level: **EE, LE, MS, HS**

Location: Fine Arts Room

Want to know more about the MST A and the MST A Board of Directors? Come join us for an informal meet and greet with MST A leadership.

Science is a Verb, Not a Noun!

Craig Gaska, Pearson Publishing

Primary Subject: **IN**

Interest Level: **EE, LE, MS**

Location: Kendall Room

Science is a verb, not a noun. Science is something that students DO. It is not a subject where students passively obtain new information. The goal of this presentation is to help you understand and apply the inquiry approach of the new science standards, which will invigorate science in your classroom. The conceptual shifts, dimensions, and the domains of the NGSS, as well as lesson planning and design will be discussed during this session.

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SESSION DESCRIPTIONS

Saturday

Saturday 9:00 AM -9:45 AM continued

Sink Your Teeth Into Science! Using Bite Mark Evidence to Teach Lab Skills and Logic

Anne LaSavage, Southfield Public Schools

Primary Subject: **GS, SE**

Interest Level: **MS, HS**

Location: Plaza Boardroom A

Come play with teeth and playdough in a tactile activity that engages students in observation, deductive reasoning and communication! My forensic science students say they learned the importance of accurate measurements and being precise with explanations. Students also refined their teamwork and presentation skills. Note: While teeth casts will be used in this high school activity, the lesson structure can be adapted for use with other objects or with other subjects and age groups.

Strengthen STEM with Community Partnerships that Integrate Arts and Social Studies

June Teisan, Carson City - Crystal; John (Trey) Smith, Northwestern University

Primary Subject: **GS, SE, CC**

Interest Level: **LE, MS, HS**

Location: Berkey Room

Learn how to design community partnerships that integrate the arts, social studies, and STEM to activate a wider range of student interests and connect the real world with the classroom.

Ten Tips for Motivating Students with Phenomena

Jane Culp, Garden City Schools; Denise Bills, Garden City Schools

Primary Subject: **GS, CC**

Interest Level: **HS**

Location: Grandview B/C

Make science fun using phenomena in the high school science classroom. Designing lessons that build real-world relationships with inexpensive activities help to engage students. We will provide you with ten tips to incorporate NGSS-designed and three-dimensional learning in your classroom that will make connections that will help students appreciate the social relevance of science.

That's Phenomenal! Science Teaching with a Twist

Rob Keys, Cornerstone University

Primary Subject: **GS**

Interest Level: **EE, LE, MS**

Location: Winchester Room

Getting students to think beyond "what I need to know for the test" is important in the Michigan Science Standards. In this session we will take Performance Expectations and look at how anchoring your science units in real-world phenomena and then using investigative phenomena to develop lessons

can help your classroom become more 3-Dimensional in practice, get your students to think more like scientists and use claim, evidence and reasoning to develop concepts and skills.

The Power of the NGSX Experience in my Classroom

Holly Hereau, Lee M. Thurston High School

Primary Subject: **BI, GS**

Interest Level:

Location: Pearl Room

Over 6000 Michigan teachers have experienced the NGSX study group professional learning experience. If you been part of this experience, come learn more about what others are doing and share your ideas. If you have thought about attending a study group in your region, come learn more about how it might change your practice! This session will specifically highlight applications of NGSX in the high school classroom!

Saturday 9:00 AM - 10:45 AM

Art and Science in Nature

Nancy Berg, Clarkston Family Farm; Chelsea O'Brien, Clarkston Family Farm

Primary Subject: **CH, ES, EN, IN, CC**

Interest Level: **LE, MS**

Location: Emerald A

Participants will enjoy learning new strategies for approaching topics such as genetics, geology, chemistry and ecology with students through unique art and science explorations. This presentation is a hands-on workshop with many take away samples to share with your students including eco-printing, agricultural art and the science of salves.

Bioengineering Challenges and Middle School Life Science

John Howarth, SEPUP, UC Berkeley; Timothy Hurt, UC Berkeley

Primary Subject: **BI, IN, SE**

Interest Level: **MS**

Location: Pantlind Ballroom

Using readily available materials, this workshop will utilize hands-on activities and discussion to illustrate how to integrate engineering practices into middle school life science. By participating in challenges, such as designing an artificial heart valve, participants will experience aspects of the engineering design cycle. The workshop will emphasize the interconnectedness of the components of the science and engineering practices and the integration of the three dimensions of the NGSS.

SESSION DESCRIPTIONS

Saturday

Saturday 10:00 AM - 10:45 AM

Celebrate the 50th Anniversary of the Moon Landing!

Marlenn Maicki, Detroit Country Day School; Meghan Kurleto, Detroit Country Day School; Nicole Jakubowski, Detroit Country Day School

Primary Subject: SE, CC
Interest Level: EE, LE, MS
Location: Kendall Room

Celebrate the 50th Anniversary of the Moon Landing! Review the history of the Apollo program. Learn ways to build and safely launch different rockets with different ages of students. Plan a rocket launch to celebrate the first launch to the Moon. Find out how to organize and document your event. Match the many connections to standards for science, technology, engineering, math, reading, and social studies.

Designing Destructive Earthquakes

Fred Thomas, Math Machines; Robert Chaney

Primary Subject: ES, PH, SE
Interest Level: MS, HS, PS
Location: Riverview Room

Using “shake tables” as simple as a board with handle and accelerometer attached, learners can investigate why horizontal accelerations, velocities, energy and resonant frequencies of earthquake vibrations are more important than magnitude in determining damage to buildings, dams, bridges and other structures. Also learn to quantify the “maximum considered earthquake” which engineers use for any onshore location (including your home or school) even in relatively low-risk Michigan. Both natural and human-induced earthquakes will be considered.

Do you Want to Build a Greenhouse?

Chad Scholten, Forest Hills Central High School

Primary Subject: BI, CH, ES, EN, SE
Interest Level: HS
Location: Plaza Boardroom A

Hear the story about the construction of our DIY greenhouse. We will share our initial dream and design, the construction with staff and students, and the operation of a solar-heated hoop house that was built by and is managed by high school students. Come to listen if you are only interested in a simple school garden because resources will be shared for integrating gardening into any K-12 science classroom.

Lab Reports Can be Fun!

Mike Sinclair, Kalamazoo Area Math & Science Center

Primary Subject: GS, CC
Interest Level: HS
Location: Grandview A

Writing a quality lab report can and should include the opportunity for students to be creative. In this

session, a variety of report forms will be examined, all of which will enhance student understanding and provide more interesting reading for the teacher.

Making Your NGSX Workshop Pop!

Michael Gallagher, Oakland Schools and MiSTEM Network

Primary Subject: GS
Interest Level: EE, LE, MS, HS
Location: Pearl Room

This session is an invitation to NGSX facilitators to come together to share discovered approaches and to troubleshoot problems of implementation. Were the big ideas missed by some who were annoyed by Air Puppies? Did participants struggle to imagine how this works in their setting? Or, did you figure out a great way to establish culture, or maximize participation? What innovations can you share on how you structured NGSX in your region? Come to share and take away great new insights.

Maps as Models in Earth and Environmental Science Classroom

Andrew Bruen

Primary Subject: ES, EN, IN, TE, CC
Interest Level: MS, HS
Location: Vandenberg B

The use of online mapping applications in the Earth and Environmental Science classroom is a multi-disciplinary, 3D way to analyze, create and communicate spatial relationships between many science concepts. This presentation will focus on several examples which can easily be incorporated into middle and high school science curriculum for both multidisciplinary classes and content specific classes.

Session Key:

PRIMARY SUBJECT LEVELS:

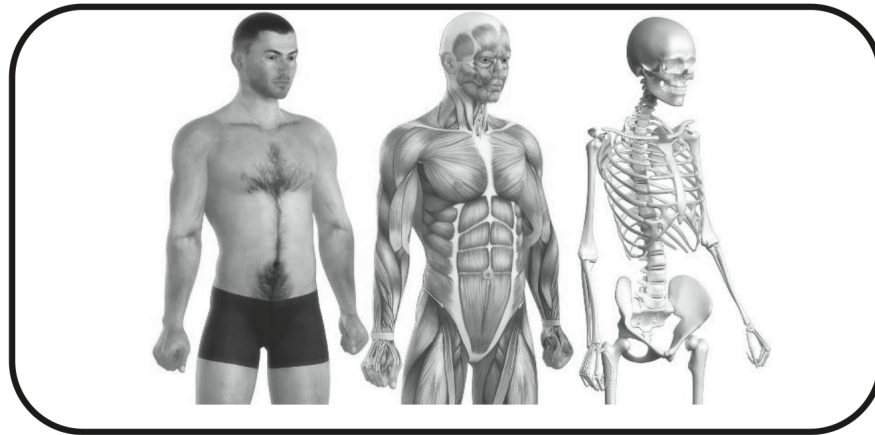
AS - Assessment
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PH - Physics
SE - STEM Education
CC - Cross Curricular
Integration

INTEREST LEVELS:

EE - Early Elementary
LE - Late Elementary
MS - Middle Level
HS - High School
PS - Post Secondary

■ Featured Session



Human Cadaver Workshop

Participants will be able to review their knowledge of human anatomy and physiology while learning new details as they study and manipulate actual human cadavers in the cadaver lab at Grand Rapids Community College. Participants will also learn how to use virtual reality cadaver dissection software that can be used in their classrooms at minimal cost.

Note: Participants must be current teachers of human anatomy and/or physiology or expect to teach it in the next academic year. *Preregistration is required at the MSTA conference website.*

Friday March 1, 6-8:30 p.m. Calkins Science Center building, Grand Rapids Community College

Workshop Leader: Dr. Greg Forbes, GRCC Biological Sciences, gforbes@grcc.edu

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Explore the natural environment while earning college credit at the CMU Biological Station on Beaver Island in northern Lake Michigan.

Opportunities for high school students and science teachers:

Students: BIO 100z Introduction to Field Biology July 8-19, 2019

High School students, get an introduction to the techniques and methods for field studies in biology. Learn about sampling procedures, interpretation and data analysis that emphasize basic ecological relationships between organisms and their environments.

Teachers: Many workshops offered including Water Quality for Educators, Bird Diversity, Great Lakes Plant Communities and more. See se.cmich.edu/CMUBS for more information.

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michiganseagrants.org

From vessel-based learning opportunities to curriculum that uses Great Lakes data, Michigan Sea Grant has a wide range of resources for teachers.

TEACHING WITH GREAT LAKES SCIENCE
Curriculum resource: greatlakeslessons.com

GREAT LAKES EDUCATION PROGRAM
Vessel-based learning: glep.us



Michigan Sea Grant helps to foster economic growth and protect Michigan's coastal, Great Lakes resources through education, research, and outreach. A collaborative effort of the University of Michigan and Michigan State University, Michigan Sea Grant is part of the NOAA-National Sea Grant network of 33 university-based programs.

SESSION DESCRIPTIONS

Saturday

Saturday 10:00 AM - 10:45 AM continued

Missed Connections: Reuniting Alternative Students with Their Environment Through a Cross-curricular Day in the Field

Samantha Lichtenwald, Bay-Arenac Community High School

Primary Subject: **BI, CH, EN, SE, TE, CC**

Interest Level: **HS**

Location: Berkey Room

An in-depth report of how we used stream monitoring to implement a whole school unit; integrating subjects of environmental science, biology, chemistry, geometry, algebra, English, civics, history, and technology. Get the whole picture including the planning process, success stories, frustrations, partnerships, student work, final outcomes, student feedback, and future directions.

National Geographic Geo-Inquiry Process

Jessica Wagenmaker, MEECS

Primary Subject: **GS**

Interest Level: **LE, MS**

Location: Grandview B/C

In this workshop participants will become familiar with the National Geographic Geo-Inquiry process. This process is a five-step method to teach students to think about the connections between the complex human systems and the natural world. Participants will be shown how to use this process to build on student questions that reflect their interests in the local community.

Particulate Drawings and Manipulatives

Alice Putti, Jenison High School; Jamie Benigna, Roeper School

Primary Subject: **CH**

Interest Level: **HS**

Location: Atrium Room

Drawing and interpreting particulate drawings is an important skill for students to demonstrate on the AP Chemistry Exam (Science Practice 1). Teachers often underestimate student difficulty in this area. This session will present activities and lessons that improve students' ability to use particulate representations.

Showcasing High School STEM Research

Sandra Yarema, Wayne State University

Primary Subject: **SE, CC**

Interest Level: **MS, HS**

Location: Ottawa Room

The Junior Science & Humanities Symposium is an opportunity to celebrate high school students' STEM research. Find out how to participate and learn more about how to increase student engagement in STEM, showcasing a partnership with Upward Bound Students and JSHS (a program sponsored by AEOP, and administrated by NSTA).

Supporting Students' Scientific Explanations with CER

Dawn Kahler, Kalamazoo Public Schools

Primary Subject: **GS, SE**

Interest Level: **MS**

Location: Haldane Room

Learn about action research on CER done by three middle school teachers from Kalamazoo Public Schools. Facilitators will offer strategies that worked to help students gain confidence in their ability to write evidence and reasoning.

The T in STEM

Megan Birdwell, St. Charles Community Schools

Primary Subject: **SE, TE**

Interest Level: **EE, LE, MS, HS**

Location: Ruby Room

Come discover technology tools offered at local REMC and how to incorporate them into STEM education. Learn how a variety of tools can be used to help teach students the importance of technology in STEM education and career fields. Participants will engage in hands-on exploration of different items and how they can be brought into your classroom.

Using Children's Literature in Inspire STEM Learning

Kim Stilwell, NSTA - National Science Teachers Association

Primary Subject: **SE, CC**

Interest Level: **EE, LE**

Location: Nelson Room

Take my recess but please don't take my science time! Never before has it been so easy to interest students in reading and science. Success stories will be shared from schools that are successfully integrating ELA and science standards by using children's picture books to engage students and teach STEM concepts with resources such as Picture-Perfect Science Lessons and Eureka Science Activities and Stories. Leave with ideas you can implement in your classroom.

Using Phenomena to Drive Student Learning: Examples from a 5th Grade Classroom Using Next Generation Science Storylines

Holly Hereau, Lee M. Thurston High School; Lynda O'Donnell, South Redford schools

Primary Subject: **GS, BI, CC**

Interest Level: **EE, LE, MS**

Location: Imperial Ballroom

Participants will see examples from a 5th-grade classroom using an anchoring phenomenon to get students to ask questions and come up with ideas for investigations in service of figuring out how to explain a phenomenon. As students use the Science and Engineering Practices to figure out key science ideas, they come up with even more questions and investigations that dig deeper in order to reach the depth of understanding required for a full explanation.

SESSION DESCRIPTIONS

Saturday

Saturday 10:00 AM - 11:45 AM

Demystifying 3D NGSS and STEM Literacy Using the Phenomenon of Light

Pam O'Brien, STEMscopes

Primary Subject: GS
Interest Level: LE, MS, HS
Location: Pullman Room

Join us as we learn the power of using hands-on explorations to engage students in reading, writing, and making meaning as we model literacy strategies in a lesson on the Properties of Visible Light. Lead all students to mastery and higher achievement. This session will convince you that your students CAN read science, use complex vocabulary, enter into argumentation and discourse, and build the capacity for scientific literacy success in your STEM classroom.

FOCUS: Inspiring Exploration and Discovery While Reading, Writing, Thinking, and Doing

Sheryl Tavares, Learning A-Z

Primary Subject: CC
Interest Level: EE, LE
Location: Winchester Room

A strong link between literacy and Science provides students an opportunity to dig deeper into high-interest topics while mastering NGSS and ELA standards. In this session, explore how Science A-Z motivates students. FOCUS Questions set a purpose for reading while Read-Think-Write assess reading comprehension. FOCUS Books support the desire to learn and discover more while developing Scientific and Engineering Practices. Attendees will explore the multi-leveled instructional Science A-Z units and corresponding FOCUS Books.

Incorporating Modeling Instruction with Mi-STAR

Yonee Bryant-Kuiphoff, Linden Grove Middle School;
Stephanie Wagner, Portage North Middle School

Primary Subject: GS, SE
Interest Level: MS
Location: Fine Arts Room

Incorporating Modeling (Whiteboarding) practices into Mi-STAR lessons for students engagement and learning. Come and gain ideas and strategies from teachers trained in Modeling Instruction, and as MiSTAR PLFs.

Science with a Story-line

Claire Lannoye-Hall, Detroit Zoological Society; Akilah Franklin, Detroit Zoological Society; Sandy Ling, Detroit Zoological Society

Primary Subject: BI, EN, SE
Interest Level: LE, MS
Location: Emerald B

Creating a real-life scenario for science learning allows students to see themselves in the role of a scientist, providing context for science processes that can seem abstract. Join us to participate in an example based on the plight of the Panamanian Golden Frog,

a species on the brink of extinction. Participants will model field conservation methods, generate and explore theories on threats to the species, and work together to take action to help all amphibians.

Structuring Discussion to be Equitable and Rigorous

Chris Gleason, Activate Learning

Primary Subject: GS
Interest Level: LE, MS, HS
Location: Thornapple Room

The Framework promotes learning as a fundamentally social endeavor supported by collaborative and communicative norms. Yet, sustaining these norms requires teachers to examine and support K-12 students' ways of talking so they all are able to articulate, make sense of, and evaluate each other's ideas. Walk away with ready-to-use tools that foster and assess productive talk.

The Genetics and Bioethics of Opioid Addiction and Treatment!

Tamica Stubbs, Bio-Rad Laboratories

Primary Subject: BI, IN, SE
Interest Level: MS, HS, PS
Location: Ford Ballroom

Recently, the opioid epidemic has exploded in the U.S. In this session, participants will learn how to genotype and statistically analyze fictional patient samples based on their rs1800497 DRD2/ANKK1 SNPs. Using evidence, they will predict addiction risks for opioid abuse and treatment as reflected in research. Participants will also learn to permeate opioid addiction science into concepts like population statistics, allelic frequencies, pedigrees, DNA function, cell communication, gene expression, biotechnology and bioethics in their lessons.

Session Key:

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■ Featured Session

SESSION DESCRIPTIONS

Saturday

Saturday 10:00 AM - 11:45 AM continued

What if the Graduation Requirements Do Not Make Sense for Our Students?

Rashell Bowerman, MDE

Primary Subject: **GS**

Interest Level: **MS, HS**

Location: Governor's Room

As Michigan strives to ensure that all students are "Career and College Ready (CCR)", the Michigan Merit Curriculum (MMC) graduation requirements may need to be modified to meet the needs of every learner. This session provides an overview of the modifications that are allowable through a personal curriculum as well as guidance around how to make those tough decisions. Participants will gain an understanding of the options for students with and without IEP's to customize their education according to their post-school goals.

Saturday 11:00 AM - 11:45 AM

Diffusion, the Cell Membrane, and Ourselves: Biology Comes Alive through the Aesthetic Realism Method

Rosemary Plumstead, Aesthetic Realism Foundation; Sarah Ross

Primary Subject: **BI**

Interest Level: **MS, HS**

Location: Plaza Boardroom A

We'll show through demos on diffusion that this vital process has a logical, beautiful structure of opposites—high and low, freedom and order, inclusion and exclusion—opposites we and our students hope to make sense of in our daily lives. As students see this exciting relationship; they like the world more, they feel science is friendly, and they eagerly learn.

Enhancing Curriculum and Engaging Students Through Virtual Experiences

Eric Nephew; Mark Schlaudt

Primary Subject: **CC**

Interest Level: **EE, LE**

Location: Grandview B/C

The Virtual Tour Guys will demonstrate resources elementary teachers can utilize to engage students in the learning process like never before. Using interactive virtual experiences we will show teachers how to immerse students in the curriculum and take them to places they never thought possible.

Head Full of STEAM

Steven Tezak, STARBASE Alpena

Primary Subject: **SE**

Interest Level: **LE, MS**

Location: Atrium Room

You have it all: your materials, your game plan, and your students' excitement. It's full STEAM ahead! Or

is it? Are you prepared to stand back and lead your students effectively as they collaborate, question, solve, and even accept failure? With guidelines, tips, and suggested questions, you can make sure your head full of STEAM powers the momentum you want for a true STEAM experience!

How to Facilitate Student Equitable Discourse in the Classroom

Andrea Williams, Orchard Lake Middle School; Nell Bielecki, Anderson Middle School; Scott Stokes, Bemis Jr. High; George Nelson; Rachel Kent, Wilmette, IL Elementary School District

Primary Subject: **GS, IN**

Interest Level: **LE, MS**

Location: Kendall Room

This presentation will give participants a variety of tools and strategies to facilitate equitable classroom discussions. Classroom management, discussion techniques, and classroom culture building will be the major focus. NGSS's Science and Engineering Practices: Engaging in Argumentation from Evidence and Obtaining, Evaluating, and Communicating Information will be covered in depth. Following the presentation, there will be a Q & A lead by teachers who are currently teaching middle science. Teachers prepare for students to be leaders of learning.

Improving Canned Labs to Increase Ownership & Understanding of Experiments

Nina Jacks, De La Salle Collegiate High School

Primary Subject: **GS, BI, CH**

Interest Level: **MS, HS**

Location: Grandview A

Take ownership of the scientific method by purposefully editing canned labs to better reflect your style, the needs of your students and the curriculum, as well as fit into the class-time available. This session is designed for teachers who primarily use pre-made lab experiments (without modifications) such as: textbook-provided manuals, labs on the internet, reports provided by a science materials supplier, and/or otherwise unaltered printed labs. Please bring a computer and canned labs.

Observations of How NGSX is Transforming Classrooms for Both Teachers and Students

Kim Smith, Seaborg Center - NMU

Primary Subject: **GS, SE, CC**

Interest Level: **EE, LE, MS, HS, PS**

Location: Riverview Room

Kim will engage participants in an interactive presentation and lively discussion about the diverse impacts on both teachers and students of transforming classrooms using 3-dimensional learning called for in the Framework and NGSS.

SESSION DESCRIPTIONS

Saturday

Proven Instructional Practices in STEM: Setting ALL Students up for Success

Chris Blackstock, Delta Education; Kathleen Schutter, School Specialty

Primary Subject: **SE**
Interest Level: **LE**
Location: Nelson Room

Investigate phenomena and experience how students create models, construct explanations, and engage in argumentation from evidence in FOSS lessons. Explore how these NGSS science and engineering practices are integrated and reinforce each other to enhance student learning. Leave with instructional strategies to support sense-making.

Students Leading Change to Protect Our Waterways

Amanda Syers, GVSU Center for Educational Partnerships; Joanna Allerhand, Grand Valley State University; Jessica Vander Ark, Grand Valley State University

Primary Subject: **EN, SE, CC**
Interest Level: **EE, LE, MS, HS**
Location: Vandenberg B

Place-based education (PBE) involves moving beyond classroom walls and teaching students through their own communities. Through PBE, students engage in real-world problem solving by identifying a need in their community and developing a solution to help address that need. This presentation will share how K-12 students can serve as leaders in the community to protect local waterways from pollution.

Understanding Fields & Energy

Don Pata, Grosse Pointe North High School; Laura Ritter, Troy High School

Primary Subject: **CH, PH, IN**
Interest Level: **MS, HS**
Location: Vandenberg A

The new standards refer often to fields. But what really is a gravitational, electric or magnetic field? In this session, you will have the opportunity deepen your own understanding of the concept of fields and how they relate to energy. We will use strategies and representational models that can easily be used in a secondary science classroom to reach all students.

VR in Your Classroom

Walter Charuba, Grosse Pointe Public Schools

Primary Subject: **GS, CC**
Interest Level: **LE, MS, HS**
Location: Ruby Room

The presentation will describe how I supplemented a successful and exciting Google Cardboard's VR (Virtual Reality) program in my classroom. I will also save time for the teachers by listing and experiencing various apps and sites that are successful in the world of education. Technology has brought a whole new dimension to the science classroom.

Saturday 11:00 AM - 12:45 PM

Coding Science Supplies! BEGINNER FRIENDLY!

Cameron Bancroft, Marquette Area Public Schools

Primary Subject: **SE, TE, CC**
Interest Level: **MS, HS**
Location: Ottawa Room

ZERO EXPERIENCE NEEDED! Learn to use an Arduino to have your students create science equipment that they can use to collect data. In this session, we will build sensors that we can use to collect data in science experiments. Using an Arduino board and prewritten code you and your students can create the tools that are needed to complete almost any experiment. From ultrasonic distance sensors to thermometers, we can build it all!

Don't Reinvent the Wheel - Creating Inquiry Experiences for Students

Vanessa Logan Wentzloff, Avondale High School

Primary Subject: **GS**
Interest Level: **MS, HS, PS**
Location: Berkey Room

Take the labs you've found online, used for years or always wanted to do and give them an inquiry makeover for your classroom! I will take teachers through the process of taking labs and experiments you've always done and create amazing inquiry-based experiences for your students without spending too much time creating new things.

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■ Featured Session

SESSION DESCRIPTIONS

Saturday

Saturday 11:00 AM - 12:45 PM continued

Elementary and Middle School Extravaganza

Betty Crowder, Oakland University; Susan Tate, Whitehall Middle School; Conni Crittenden, Explorer Elementary; Patti Bills, Oakland University

Primary Subject: IN, SE
Interest Level: EE, LE, MS
Location: Imperial Ballroom

Join us for the MSTA Elementary and Middle School Extravaganza! Teachers and pre-service teachers will be sharing lessons, activities, resources, and outstanding trade books in a poster session type format. Come for a few minutes, or stay for the whole time. Either way you'll walk away with a head full of ideas and a handful of materials.

Flipping MEECS: Using Existing Materials in a Next Gen Classroom

Gabrielle Likavec, Michigan Geographic Alliance

Primary Subject: EN, SE, CC
Interest Level: LE, MS
Location: Emerald A

The MEECS units are quality materials that have been used to teach Environmental Education topics across Michigan for years. In this workshop we will take a look at how to flip these units and create student led, science inquiry in your classroom.

Gamification in the Biology Classroom

Mary Burdgick, Arbor Prep in Ypsilanti

Primary Subject: BI
Interest Level: HS
Location: Pantlind Ballroom

This presentation will review the development and execution of a board game in a science classroom. This presentation will focus on the game Protein Pursuit that I developed along with another teacher at my school. We will also discuss how to develop other games in the classroom to further student engagement and achievements.

Going Nuclear!!!

Christine Webster, Hudsonville Public Schools; Doug Ragan, Hudsonville Public Schools

Primary Subject: CH, EN
Interest Level: MS, HS
Location: Pearl Room

Come "go nuclear" with us as we present different ways to help students connect with the topic of nuclear energy. Licorice half life, a waste containment lab, and a socratic debate on whether nuclear energy is worth the risk will be the focus of this session.

Managing Group Talk & Teamwork

Dawn Kahler, Kalamazoo Public Schools; Kari Keith

Primary Subject: GS
Interest Level: MS
Location: Haldane Room

Productive talk is an essential part of NGSS and the Mi-STAR curriculum experience. Through discourse and teamwork students will learn to construct explanations and support their thinking with evidence. They will also learn to reflect, consider new evidence and reevaluate their thinking. But, how do you ensure that students are focused and actively participating during this time? This session will share some important strategies that will build a science community and promote equity and participation among students.

Writing in Science: Out of the Silo and Onto the Page

Brandon Groff, Greenhills School

Primary Subject: GS, BI, EN, CC
Interest Level: LE, MS, HS
Location: Heritage Room

In an ongoing effort to engage in interdisciplinary learning, we designed a class project that would sharpen students' abilities to observe the natural world while strengthening technical and creative writing skills. We will be modeling what we have done in the classroom, and discussing how we utilized a community partner, The Leslie Science and Nature Center, to further these processes.

Saturday 12:00 PM - 12:45 PM

Defining Temperature

Scott Milam, Plymouth High School

Primary Subject: CH, PH
Interest Level: EE, LE, MS, HS
Location: Fine Arts Room

This session will attempt to challenge your conceptual understanding of what temperature is. We will look at some simple experiments involving temperature and analyze at the particulate level. We will also push for concepts such as heat, sensation and specific heat capacity where simple definitions of temperature can restrict learning.

Engaging and Motivating Young Scientists!

Jennifer Saunders, Carsonville Port Sanilac

Primary Subject: CC
Interest Level: EE
Location: Winchester Room

Are you a K-2 teacher that struggles with fitting science into the curriculum? Do you wonder if your students are REALLY engaged and motivated to learn about science topics? These are things we all struggle with. I started listening to what the students WERE talking about and took a project-based learning

SESSION DESCRIPTIONS

Saturday

approach! Some topics included Ants, Bees and Dogs! Seem too SIMPLE? It was simple and I even became more excited to teach. Come and learn how easily and naturally this can be done in your class!

Five Phenomenon that Work in (almost) any Science Classroom

Andrew Frisch, Farwell High School

Primary Subject: **GS, BI, CH, EN, PH, IN, SE, CC**

Interest Level: **MS, HS**

Location: Emerald B

From the first day of class to an entire unit design, phenomenon will drive the lesson plans. Five examples with explanation of how phenomenon work in a class setting are provided. These have been used and work. Whether you are experienced or just getting started with NGSS and its engineering practices and cross cutting concepts, there will be some original and USEABLE information provided on phenomenon.

Free Modeling Tools for the Michigan Science Standards

Rick Brown, Wayland Union Public Schools; Russell K Columbus, Monroe Public Schools; Darrell Hendrickson, CLK Public Schools; Derek Kendall, Plymouth-Canton Community Schools; Kristen Murdock, West Branch-Rose City Areas Schools; Monica Thoune, Hannahville Indian School/Nah Tah Wahsh PSA

Primary Subject: **BI, ES, EN, PH, SE**

Interest Level: **HS**

Location: Governor's Room

Looking to add modeling to your curriculum? Multiple teachers from around the state will be in this presentation to share how they have used free web-based modeling tools to create a variety of place-based units to enhance their existing curriculum.

Get Out!: Taking Student Learning Outdoors

Erin Parker, Detroit Zoological Society

Primary Subject: **BI, ES, EN**

Interest Level: **EE, LE, MS, HS**

Location: Nelson Room

Getting your students outside of the classroom walls invites their curiosity, engages and deepens their understanding of science concepts, and connects their learning to the real world. Learn ways to get out of the classroom while integrating low-cost/high-impact experiences into your current curricula. We'll discuss how teaching in the outdoors can benefit both student learning and teacher innovation, the opportunities and challenges of taking students outside, and provide resources for teachers ready to get out.

Getting Students Out of Their Seats

Lu Anne Clark Cuthbert, Lansing Community College

Primary Subject: **IN**

Interest Level: **MS, HS, PS**

Location: Vandenberg B

We will be doing and discussing several physical science activities that get students moving and sometimes even out of the classroom! Not just "hands

on" but using their whole bodies sometimes. Designed to get students excited about science and hopefully learn something in the process.

How do we make Figuring out Phenomena Central in the Classroom?

Wendy Johnson, Kentwood Public Schools

Primary Subject: **GS, BI**

Interest Level: **HS**

Location: Plaza Boardroom A

Our new standards require students to move beyond simply learning about science to figure out phenomena for themselves. This shift requires changes to nearly every aspect of instruction and assessment. I will share how I use a driving question board, a student learning tracking tool, learning targets, scaffolding tools, and formative assessments to support students in figuring out phenomena in my high school biology class.

Impacts and Benefits of Construction and Removal of Dams

Stephen Mattox, Grand Valley State University; Amanda VanSpronsen; Shandra Amon

Primary Subject: **ES, EN**

Interest Level: **LE**

Location: Pullman Room

Dams are critical to water supply but disrupt Earth systems. We will model dam design and construction using Legos and evaluate evidence for their impacts and benefits.

Increasing Student Engagement by Modifying Tasks

Mark Olson, Oakland University

Primary Subject: **BI, CH, PH, IN, SE**

Interest Level: **MS, HS**

Location: Grandview BC

Modifying existing science tasks and activities to increase cognitive demand can also increase student engagement. Student teachers at Oakland University will share examples of their work to modify existing science activities and present cases demonstrating how to incorporate NGSS science and engineering practices in these efforts.

Session Key:

PRIMARY SUBJECT LEVELS:

AS - Assessment

CH - Chemistry

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Technology

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Education

PH - Physics

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Integration

INTEREST LEVELS:

EE - Early Elementary

LE - Late Elementary

MS - Middle Level

HS - High School

PS - Post Secondary

■ Featured Session

SESSION DESCRIPTIONS

Saturday

Saturday 12:00 PM - 12:45 PM continued

Lessons Learned: The Do's and Don'ts of STEM Service Learning Projects

Lina Jawad, University of Michigan-Dearborn

Primary Subject: **GS, SE**

Interest Level: **MS, PS**

Location: Ruby Room

This session highlights the significance of incorporating service learning projects in STEM within the curriculum of teacher preparation programs. Future science educators collaborate with students in one middle school that focuses on STEM programs to design and implement a STEM project. Steps for a successful project implementation as well as observations from student meetings are discussed. Reflections from students involved in service learning help examine what makes or breaks a STEM learning project.

Lesson Planning: Science Curriculum Towards Engineering Design Process

Anura Hewagama

Primary Subject: **CH, SE**

Interest Level: **HS**

Location: Atrium Room

Creating science lessons with applications in mind, combine engineering design process and NGSS alignment.

Makerspace & STEM for Lower Elementary

Diana Matthews, Detroit Country Day School; Lisa Morgan, Detroit Country Day School

Primary Subject: **SE**

Interest Level: **EE**

Location: Ford Ballroom

Exploring makerspace & STEM topics for younger children. Tried and true- tips, techniques and projects for the K-2 set. Walk away with new ideas - ready to use in the classroom.

STEM Opportunities Beyond the Classroom

Deborah Hasselschwert, Laker High School; Sarah Jordan, Caseville Public Schools

Primary Subject: **PH, IN, SE, TE**

Interest Level: **MS, HS**

Location: Riverview Room

How do you engage your students with engineering in your classroom? Science Olympiad, MDOT Design & Build a Bridge Challenge and VEX robotics, provide STEM projects you can integrate into your classroom. Information will be provided on how to access the materials and how to use the resources for student competition both inside and outside your classroom.

Sustainable Schools: How to Become a Michigan Green School

Edward Johns, Cedar Springs High School; Lauren Westerman, Kent County Dept of Public Works

Primary Subject: **GS, EN, IN, SE**

Interest Level: **EE, LE, MS, HS**

Location: Kendall Room

Learn about the Michigan Green Schools program and leave with ideas on how to help your school earn recognition as a Michigan Green School. See the path Cedar Springs High School has taken to complete green activities, and hear from Kent County's Green School coordinator about ways to earn recognition for schools focused on sustainability. Participants will have the opportunity to ask questions, start to plan their own Green Schools application, and walk away with resources and freebies.

Saturday 12:00 PM - 1:45 PM

Exploring Energy Across the Disciplines

Laura Ritter, Troy High School; Kate Hojnacki, Fraser High School

Primary Subject: **BI, CH, PH, IN, CC**

Interest Level: **MS, HS**

Location: Vandenberg A

Energy is a key crosscutting concept across all science disciplines, yet it still can be baffling. Come solo or bring a colleague from another discipline or grade level and let's explore how we can send a more cohesive message to students about energy. We will work with representational models to explore energy as it relates to systems, storage and transfer across the disciplines. You will leave with strategies to use in your classroom.

STEAM Challenges: Creating Cross-curricular Events to Engage All Learners

Robert Barrett, West Michigan Academy of EN

Primary Subject: **BI, EN, SE**

Interest Level: **EE, LE, MS, HS, PS**

Location: Grandview A

This presentation is a how-to guide on the process of designing and running rigorous STEAM-based events to teach students across disciplines. While the examples will focus primarily on engaging at-risk high school students, the fundamental techniques and principles can be applied to reach learners of all grades and backgrounds! The session will include a variety of tools including: 1) Ready-to-use lessons tied to relevant standards, 2) Templates for creating your own STEAM Challenges, 3) Links and resources to aid in the process of making your classroom more STEAM-based, and 4) Interactive experiences putting you in the learner's seat. Come with questions, resources, ideas, and an open mind!

SESSION DESCRIPTIONS

Saturday

Saturday 1:00 PM - 1:45 PM

Aquaculture Challenge: Engaging Students with Fish, Plants, and So Much More!

Elliot Nelson

Primary Subject: **BI, CH, ES, EN, IN, SE, TE**

Interest Level: **HS**

Location: Thornapple Room

Aquaculture is quickly becoming a popular lens to teach a wide variety of science, engineering, computer and even business concepts. In this session we will demo simple aquaculture systems and distribute a free curriculum guide with multiple standards-based lesson plans. We will also introduce the aquaculture challenge, a free competition to engage students in, plus the Youth Education in Aquaculture resource which connects teachers, students and aquaculture facilities including teacher training workshops.

Cool Demonstrations for Young Science Students Without Breaking the Bank

Mark Sheler, Sandusky Jr/Sr High School

Primary Subject: **GS, BI, CH, ES, EN, PH, IN**

Interest Level: **EE, LE, MS**

Location: Pearl Room

Cool Demonstrations for young science classes. Several demos that are sure to inspire and engage young minds. No need to buy expensive equipment. These phenomena are tried and true, easy to do and won't cost much. Looking for phenomena but don't want to where to start? I'll bring easy to do, easy to extract meaningful demos for you to use.

Grading with Purpose: My Journey to Standards Based Grading

Vanessa Logan Wentzloff, Avondale High School

Primary Subject: **GS, AS**

Interest Level: **MS, HS, PS**

Location: Riverview Room

How can we accurately and better assess student's knowledge and align with NGSS? In this session I will discuss my journey into Standards Based Grading in several different physics classes and how it better cultivates student ownership, student/teacher relationships and overall a better assessment strategies. You will learn how to break down a unit to create standards and learn how to assess students and have students assess themselves.

How Fast is Your Brain? Easily Introduce Neuroscience to K-12 Science Classrooms

Will Wharton, Backyard Brains

Primary Subject: **BI, SE, CC**

Interest Level: **MS, HS, PS**

Location: Plaza Boardroom A

In this session, you will be introduced to several classroom experiments which students can perform to precisely measure the speed of their reactions and reflexes by recording electricity from their own

nervous systems! We will perform these experiments and more with DIY Neuroscience research tools which are affordable, accessible, and powerful additions to your life sciences classroom. Middle school teachers can meet NGSS like MS LS1 8 with project-based learning, and High School teachers can enhance their Freshman/Advanced Bio, Psychology, and Anatomy and Physiology classes with quantitative labs and experiences. Hope to see you at my workshop!

Modeling in the Middle School Classroom

Jessica Wagenmaker, MEECS

Primary Subject: **GS**

Interest Level: **MS**

Location: Emerald A

Participants will be introduced to Modeling Instruction with emphasis on the middle school classroom. Creating a climate for student engagement and interaction will be a focus. Participants will walk away with tools they can use in the classroom to foster student conversation.

PASCO Solutions: The Most Comprehensive Laboratory Experience for the Student and Educator of Today

Julie Thomas, PASCO scientific

Primary Subject: **BI, CH, PH**

Interest Level: **MS, HS**

Location: Vandenberg B

Learn about the new tiered levels of PASCO solutions complete with classroom management and technology rolled into one. See how you can easily implement PASCO curriculum solutions, kits, or equipment in your classroom, and conveniently store your equipment in accessible carts and trays. You've spoken, and we've listened: see PASCO's new SPARKvue 4.0 software. The solution that connects ALL sensors on ALL devices so that your students have the most pedagogically congruent, enriched classroom experience.

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EE - Early Elementary

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PS - Post Secondary

■ Featured Session

SESSION DESCRIPTIONS

Saturday

Saturday 1:00 PM - 1:45 PM continued

Protecting Michigan Inland Lakes

Melissa DeSimone, Michigan Lake Stewardship Associations; Mike Gallagher, Michigan Lake Stewardship Associations

Primary Subject: **GS**
Interest Level: **MS, HS**

Location: Kendall Room

Michigan Lake Stewardship Associations works to support the health of our lakes for generations to come. In this session we will give an overview of the work we support: the Cooperative Lakes Monitoring Program (CLMP), the Michigan Natural Shoreline Partnership program, the Michigan Riparian magazine, Midwest Invasive Species Network (MISIN) and the Clean Boats Clean Waters program.

Supporting Students in the Development and Revision of Models

Wayne Wright, Thurston High School; Victor Chen

Primary Subject: **GS**
Interest Level: **MS, HS**

Location: Grandview B/C

With NGSS, students are expected to develop and use models that help explain why phenomena happen the way they do. However, students often struggle with how to construct models so that they explain their thinking, then later struggle with revising their models. In this session, teachers will engage in the process of effective modeling, and work through how to better support students as their models develop over time and as students make sense of phenomena.

Using Arduino-based Sensors on Nanosatellites to Engage Middle and High School Students with Science and Coding

Matthew Cannady, UC Berkeley; John Howarth, SEPUP, UC Berkeley; Timothy Hurt, UC Berkeley

Primary Subject: **GS, SE, TE**
Interest Level: **MS, HS**

Location: Ottawa Room

Learn about an NSF-funded project conducted by the Lawrence Hall of Science. Over a 3-year period, middle and high school students have been engaged in activities that involve programming Arduino-based sensors to collect data in and around the classroom, and from nanosatellites in low-earth orbit. Study sites include a science classroom, an after-school program, and a summer camp. Researchers were interested in whether access to a nanosatellite increased interest in science and/or coding.

Using KLEWS and Investigation Notebooks in the Classroom!

Marie Woodman, Morse Elementary Troy Schools

Primary Subject: **GS**
Interest Level: **EE, LE**

Location: Nelson Room

Learn how to use a KLEWS board in your classroom! This is a wonderful tool to help gather group

understanding and make thinking public. KLEWS boards lend themselves to using the NGSS standards with any materials your district may use. It is student-centered and promotes visible thinking. We will also explore using Investigation Notebooks as a tool for student data, thinking and learning. Students learn to write, draw and think like real scientists do in their work!

Saturday 1:00 PM - 2:45 PM

Deconstructing CERs to Help Students Construct Explanations

Tony Matthys, Michigan Technological University; John Kowalski, White Pine Middle School

Primary Subject: **GS, IN, SE**
Interest Level: **MS**

Location: Haldane Room

Scientists have been using CERs for centuries, but research shows that students still don't understand the difference between evidence and reasoning. How do you help your students use this scientific tool like a scientist? Learn how to guide your students to distinguish between evidence and reasoning by digging into examples from the Mi-STAR curriculum. Handouts provided to support implementation of this practice in the classroom.

Easy Tech for the Next Generation Science Standards

Maria Gonzalez, Holy Family School

Primary Subject: **GS, TE**
Interest Level: **LE, MS, HS**

Location: Pantlind Ballroom

Science teachers recently have encountered this dilemma—how to incorporate NGSS standards with the tech knowledge your students will need to for the future? Bring your camera enabled device to try out some cool, classroom-tested, student approved tech tools you and your students can use right away as a blended learning approach to several NGSS best practices.

Formative Assessment Using Tech Tools

Mike Fine, Ottawa Area ISD

Primary Subject: **GS, TE, AS**
Interest Level: **EE, LE, MS, HS**

Location: Fine Arts Room

How do you check for student understanding and make sure students are engaged in their own learning? This session will focus on easy to use electronic formative assessment applications that will make assessment more fun and more engaging for your students. Come learn how to use these tools to help improve your instructional practice and ensure that your students are learning on the first day of school. By attending this session, you will have access to a Google Folder that will contain complete set-up instructions for each tool demonstrated (Quizizz, Google Forms, Plickers, Padlet).

SESSION DESCRIPTIONS

Saturday

Helping Students with D=RxT

Marian Prince, Andrews University

Primary Subject: **PH, SE, TE**

Interest Level: **MS, HS**

Location: Ruby Room

Do your students have difficulty keeping straight the relationship between distance, velocity, and time? The TI-Rover, a calculator-controlled robot can be used to help students experience that relationship and apply it to a task while learning programming. Beginners welcome.

Implementing the Shifts in the Next Generation Science Standards: Enacting The Sound Unit Through The Learning While Teaching Project Puts All The Pieces Together!

Wanda Bryant, Detroit Public Schools Community District; DeVette Brown, Detroit Public Schools Community District

Primary Subject: **PH, IN, TE**

Interest Level: **MS**

Location: Atrium Room

Enacting the sound and fog units through Northwestern University Learning While Teaching Project cemented three-dimensional understanding in our 3+ year journey to Next Generation Science Standards implementation. The sound unit has earned the NGSS Design Badge, an example of high quality instructional materials. The fog unit is currently being field tested by several teachers across the United States. Come engage with science and engineering practices to figure out the anchoring and investigative phenomena and experience routines that bring these units to life.

Modeling Dynamic Systems Using InsightMaker.com

Chuck Palosaari

Primary Subject: **IN, SE, TE**

Interest Level: **MS, HS**

Location: Pullman Room

Learn how to create system dynamics models with Insightmaker; a free, browser based modeling tool. Example modeling applications include predator-prey relationships, population dynamics, energy and water balances. This workshop will include an introduction on how Insightmaker can be used in the classroom, tutorials on getting started with developing system dynamics models with your students, managing models with groups, and how to share your models on the web. Visit www.insightmaker.com for more information. (Bring a laptop, if possible)

Natural Communities of the Great Lakes: Applying NGSS to Field Based Learning

Liz Glynn, Matthaei Botanical Gardens & Nichols Arboretum

Primary Subject: **BI, ES, EN**

Interest Level: **MS, HS**

Location: Heritage Room

Field-based learning connects youth to natural sciences and to stewardship. We present a field trip,

using our own Great Lakes garden, that connects the unique soils and plant communities of the Great Lakes with NGSS goals. We use interactive activities to explore soils, plant adaptations and ecosystems which engage students and explore how human impacts, including climate change, may affect these systems now and in the future. Learn how to use these activities in your classroom and/or local naturalized sites and take away resources to explore unique plant communities near you.

Never Mind Strawberry Fields... Energy and Fields Forever

Kristin Mayer, East Kentwood High School; Laura Sloma, East Kentwood High School

Primary Subject: **GS, BI, CH, ES, EN, PH, IN, SE, CC**

Interest Level: **MS, HS**

Location: Governor's Room

Conservation of energy is a foundational concept and one of the crosscutting concepts applied in all disciplines in three-dimensional learning. The terms used with energy and the way we think about energy have also changed with the Framework and NGSS. This workshop will share activities we use in our classes to build the concepts of energy, fields, and conservation of energy combining ideas from Modeling Instruction, Interactions Curriculum, and NGSS.

NGSS Assessments: How will we know they are learning?

Pam O'Brien, STEMscopes

Primary Subject: **AS**

Interest Level: **LE, MS, HS**

Location: Imperial Ballroom

What will they look like? How are they constructed? I heard they will be performance-based! These and other questions will be part of this engaging and interactive session on NGSS assessments and ways to provide for student success on each.

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■ Featured Session

SESSION DESCRIPTIONS

Saturday

Saturday 1:00 PM - 2:45 PM continued

Practice the “Science and Engineering Practices” with FISH!

Amy Emmert, Belle Isle Conservancy; Emily Weiss, Belle Isle Conservancy

Primary Subject: **BI, EN, SE**

Interest Level: **LE**

Location: Winchester Room

Here's an opportunity to practice the “practices”. Participate in a virtual field trip to the nation's oldest (and coolest) aquarium, the Belle Isle Aquarium in Detroit. Experience how all 8 “Science and Engineering Practices” are incorporated into just one field trip. This 5th grade field trip is part of an NSF funded research project in partnership with Wayne State University, Michigan Technological University, and the Belle Isle Conservancy.

Stop Creating Lesson Plans: Start Creating Learning Experiences

Dawn McCotter, Van Andel Education Institute

Primary Subject: **BI, CH, ES, EN, PH, IN, SE**

Interest Level: **EE, LE, MS, HS**

Location: Emerald B

Engage your students to think and act like scientists. Be the teacher that transforms everyday lesson plans into authentic, memorable learning experiences with inquiry-focused instruction. Come with a willingness to inspire learning; leave with strategies and tools to make it happen.

The NGSS Teaching Shift: Mber (Model Based Biology) Will Ignite You!!

Heidi Schuitema, Cedar Springs High School

Primary Subject: **BI**

Interest Level: **HS**

Location: Berkeley Room

Tour an EXCELLENT mentor curriculum for biology teachers who want to hit the ground running with 3D teaching and learning to NGSS. Based on its credentials, Model Based Biology (MBER) is a trustworthy adviser for teachers. It guides students through incremental building of explanatory ideas – THEIR models. It provides structured lessons with built in focus on making student thinking visible, collaborative/collective progress, and reasoning oriented practices. It is packed with intellectual work for students. MBER provides the teacher with vivid rationale for their revised role in teaching and learning right down to teacher moves. Very accessible, immediately; affordable and top notch!! NGSX approved!! NGSS all the way!!! We will experience that “shift” with some curriculum activities.

Saturday 2:00 PM - 2:45 PM

5 Days that Changed my Life: Coding in the Science Classroom

Don Pata, Grosse Pointe North High School

Primary Subject: **CH, PH, IN, TE**

Interest Level: **HS, PS**

Location: Vandenberg A

Have you ever wondered how you could bring some coding into the classroom? It seems daunting, however last summer I was part of a group who learned how to do just that. Come see what we learned, learn some coding and see what the students experience. Also learn how you can sign up for next summer's coding workshop.

A Lecture Style Lesson Where all Students are Engaged? Yes, Please!

Karen Malloy

Primary Subject: **GS, TE**

Interest Level: **EE, LE, MS, HS, PS**

Location: Thornapple Room

When you are teaching, how do you know that your students are listening? Or if they truly understand what you are teaching? With PearDeck, a Google add on, teachers can get a quick and accurate check of student engagement and understanding multiple times throughout a traditional lesson. Bring your own device and see this program in action.

Argument-Driven Inquiry in the Middle School Classroom

Victor Sampson, University of Texas at Austin

Primary Subject: **GS, CC**

Interest Level: **MS**

Location: Ottawa Room

Learn about Argument-Driven Inquiry and how it can help middle school students learn how to use core ideas, crosscutting concepts, and scientific practices of the NGSS to explain natural phenomena. The session includes a demonstration lab investigation and discusses the integral nature of science and literacy.

Free-Range Students: In the Field for Obtaining, Evaluating, and Communicating Information.

Elizabeth Christiansen, Center for Freshwater Research and Education, Lake Superior State University; Barb Light, Lake Superior State University

Primary Subject: **BI, CH, ES, EN, IN, CC**

Interest Level: **MS, HS**

Location: Kendall Room

How do we get students excited about “Obtaining, Evaluating, and Communicating Information” when they feel disconnected from the research? This practice becomes meaningful when students participate in fieldwork as part of a network of other

SESSION DESCRIPTIONS

Saturday

students and scientists collecting, analyzing, and interpreting data. Given the opportunity to experience data-collection first-hand, students see how their place in the Great Lakes Watershed connects and contributes to student and scientist research across the state and beyond.

Global Health Got Protein

Tamica Stubbs, Bio-Rad Laboratories

Primary Subject: **BI, CH, IN, SE, CC**

Interest Level: **MS, HS, PS**

Location: Plaza Boardroom A

Incorporate NGSS science and engineering practices in your biology class by engaging students to define the problem of world hunger. Considering constraints, students will design a treatment plan (solution) for protein-energy malnutrition and test it via the Bradford Assay, in the form of an evidence-based argument.

Growing Language and Science: A Garden of Effective Strategies

Mary Kate O'Meara

Primary Subject: **GS**

Interest Level: **EE, LE**

Location: Grandview B/C

The NGSS include critical thinking and communication skills that students need for success and citizenship in a world “fueled by innovations in science and technology.” The NGSS integrates these practices with the science content. The English Language Arts Standards of the Common Core stress critical thinking, problem solving and analytical skills. This session will provide strategies that develop language fluency and the Next Generation Standards. These strategies create a science-based reading/writing workshop.

NGSS-aligned Water Quality Lessons for Middle School Grades from the Pathways to Science Teaching Program

Heather Petcovic, Western Michigan University; Kevin Koch, Linden Grove Middle School; Valerie Long, Loy Norrix High School; Paul Vellom, Western Michigan University

Primary Subject: **ES, EN**

Interest Level: **MS, PS**

Location: Emerald A

Pathways to Science Teaching is a grant-funded program at Western Michigan University designed to improve the preparation of science teachers. Each summer, eight undergraduates work with WMU faculty and Kalamazoo Public Schools teachers to conduct water quality research and teach lessons based on their research to grade K-8 youth in WMU summer camps. Here we share an overview of the program and participant-created lessons emphasizing NGSS science and engineering practices for middle school grades.

Promoting STEM with a STEM Society

Robert Ause, Greenhills School; Ruth Miller, Greenhills Public Schools

Primary Subject: **SE**

Interest Level: **HS**

Location: Vandenberg B

Science and Math teachers have long sought to integrate the learning and skills in these two disciplines. Developing a STEM certificate program at your school can help you and your students recognize how your instruction in math and science courses use tools and skills from the various STEM fields. Such a program helps students recognize their own interest in STEM fields.

Red Planet Pioneers: A Mission to Mars

Paulette Epstein

Primary Subject: **SE**

Interest Level: **LE**

Location: Pearl Room

In 2017, the Michigan Science Center was awarded a grant from the Michigan Space Grant Consortium. With this grant, the Michigan Science Center was able to develop and pilot a Mars themed after school program for 3rd through 5th graders called the Red Planet Pioneers. The program focused on how we might get to the red planet Mars. In this session, we will be discussing the program, trying out one of the lessons together, and discussing how the materials can be accessed to implement your own Red Planet Pioneers after school program.

Using S.T.E.M. to Create Marble Runs

Brian Stroble

Primary Subject: **ES, SE**

Interest Level: **LE**

Location: Grandview A

Using the NGSS standards for S.T.E.M., students will investigate gravity with marble runs that can be created from card stock. Hands-on building and testing help students understand the effects of gravity and that gravitational force is always pulling objects to the center of the Earth.

Using Virtual Experiences to Teach Weather in the Elementary Classroom

Eric Nephew; Mark Schlaudt

Primary Subject: **ES**

Interest Level: **EE, LE**

Location: Nelson Room

Join the Virtual Tour Guys to see how you can bring lessons about weather to life through interactive virtual experiences. Combining 360 panoramic photos and information presented through a variety of multimedia resources we will help you engage your elementary students like never before.

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INTEREST LEVELS

ALL LEVELS

A Lecture Style Lesson Where All Students Are Engaged? Yes, Please!
Building a Model of Force as an Interaction
Developing Science Process Skills Through Citizen Science & Schoolyard Investigations
NextGenPBL: Supporting Transition to MSS
Observations of How NGSX is Transforming Classrooms for Both Teachers and Students
STEAM Challenges: Creating Cross-curricular Events to Engage All Learners
The Matrix, Fully Loaded: Sharing Best Practice in the Science Classroom
The Question Formulation Technique: Teaching Students to Formulate Their Own Questions
Turning Chem Labs into STEM Labs

EARLY ELEMENTARY

Why Make? A Maker Space Experience For Your Classroom
A Focus on Modeling in the Phenomenon-Based Classroom
A Lecture Style Lesson Where All Students Are Engaged? Yes, Please!
Active Programs
Argumentation and Explanation in FOSS
Asking Questions and Planning and Conducting Experiments: Using the Question Formulation Technique
Biomedical Engineering: GET A GRIP!
Building a Model of Force as an interaction
Calling All Carbons
Celebrate the 50th Anniversary of the Moon Landing!
Centering Out-of-school Knowledge in STEM-based Makerspaces
Cool Demonstrations for Young Science Students Without Breaking the Bank
Cut It, Stab It, Slice It, Dice It: Using the Potato in the Science Classroom
Defining Temperature
Developing a Plan for Michigan Science Standard Implementation - K-6!
Developing Science Process Skills through Citizen Science & Schoolyard Investigations
Elementary Extravaganza
Engaging and Motivating Young Scientists!
Engaging Students in Asking Meaningful Questions
Engaging with Socio-Scientific Issues Through the Media
Engineering - Literally!
Enhancing Curriculum and Engaging Students Through Virtual Experiences
Escape Rooms - Gen Z's Answer to Learning and Career Discovery
Exploring Cosmic Gamma Rays in a High School Classroom
FOCUS: Inspiring Exploration and Discovery while Reading, Writing, Thinking, and Doing
Formative AS Using Tech Tools
Get Out!: Taking Student Learning Outdoors
Gettin' Googly in the Science Classroom
Getting Students to Argue - Encouraging Discussion for All Students
Go Play Outside? But Why? Nature Disconnect and our Kids
Grand Slam 3-D Assessment - Researchers, Developers, and Practitioners to Build Capacity, Develop Items, and Implement Strategically
Growing Language and Science: A Garden of Effective Strategies
Hands-on and creative teacher-developed Invasive Species Lessons to Achieve Michigan Science Standards
How Do You Know What They Know? Putting the Students in Charge of Their Learning.
Learning Target in NGSS
Make Time for Science with Project-Based Learning
Makerspace & STEM for Lower Elementary
Maker-space Design Thinking Challenge
Making Your NGSx Workshop Pop!
Materials Driven Inquiry
Meaningful Moments - Project Based Learning and NGSS K-5
Michigan's Electricity
Muffins for Members

Nature-Based Education: Tackling the Great Outdoors with All Learners Throughout the Early Childhood School Year
NextGenPBL: Supporting Transition to MSS
NSTA Enhanced eBooks+ Kids Collection
Observations of How NGSX is Transforming Classrooms for Both Teachers and Students
PH is for EVERYONE
Phenomena-Driven Lessons for the K-8 Classroom
Picture Perfect Science EE
Picture Perfect Science LE
Powerful Tools for ALL classrooms: Question Boards, Scientific Models, and Productive Talk!
Productive Talk Implementation: Year Two
Project-based STEM Challenges for Elementary Students
Requirements for Becoming a Certified Environmental Educator
Science is a Verb, Not a Noun!
Science/Math Integration for a Sustainable Planet
STEAM Challenges: Creating Cross-curricular Events to Engage All Learners
Stop Creating Lesson Plans: Start Creating Learning Experiences
Storytelling with a Twist
Students Leading Change to Protect Our Waterways
Supporting District Implementation of 3-Dimensional Science
Sustainable Schools: How to Become a Michigan Green School
Take Your Students Outside to Engineer!
Targeting Scientific Literacy
That's Phenomenal! Science Teaching with a Twist
The Matrix, Fully Loaded: Sharing Best Practice in the Science Classroom
The MiSTEM Network: Supporting Michigan's STEM Future
The Question Formulation Technique: Teaching Students to Formulate Their Own Questions
The Rock Cycle
The T in STEM
Thinking Three-dimensionally About Science Trade Books
Tools for Thinking (Not Worksheets)
Transforming Students to Stewards: Fostering Great Lakes-Literacy in Schools
Troy School District K-5 Science Materials Adoption Process in NGSS
Turning Chem Labs into STEM Labs
Tweaking ASs for NGSS
Use the NGSS Engineering Practices to Make Curriculum Decisions
Using Children's Literature in Inspire STEM Learning
Using Debate to Assess Model Based Learning
Using Instructional Videos to Enhance Student Success in an Elementary Science Classroom
Using KLEWS and Investigation Notebooks in the classroom!
Using Models and Images to Teach Shapes and Kinds of Land and Bodies of Water
Using Phenomena to Drive Student Learning: Examples from a 5th Grade Classroom Using Next Generation Science Storylines
Using Virtual Experiences to Teach Weather in the Elementary Classroom
What's So Phenomenal About Phenomena?
Who is Birdbrain Amos and What Does He Have to Do with the Hippo and Oxpecker?
Wildlife CSI to Teach Claim, Evidence, Reasoning
You Can Teach TE, Yes? You!!

LATER ELEMENTARY

Why Make? A Maker Space Experience For Your Classroom
A Lecture Style Lesson Where All Students Are Engaged? Yes, Please!
Active Programs
Argumentation and Explanation in FOSS
Art and Science in Nature
Asking Questions and Planning and Conducting Experiments: Using the Question Formulation Technique
Assessing 3-D Learning Using Multiple Literacies in Project-Based Learning Resources

Biomedical Engineering: GET A GRIP!
 Building a Model of Force as an interaction
 Building atomic model of matter and conservation of matter concept
 Calling All Carbons
 Catching Up With Carp: Updates and Ideas on Incorporating Invasive Carp into Your classroom
 Celebrate the 50th Anniversary of the Moon Landing!
 Centering Out-of-School Knowledge in STEM-Based Makerspaces
 Claim-Evidence-Reasoning: Scientific Explanations about Phenomena
 Cool Demonstrations For Young Science Students Without Breaking the Bank
 Cut It, Stab It, Slice It, Dice It: Using the Potato in the Science Classroom
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 Demystifying 3D NGSS and STEM Literacy Using the Phenomenon of Light
 Developing a Plan for Michigan Science Standard Implementation - K-6!
 Developing Science Process Skills through Citizen Science & Schoolyard Investigations
 Easy Tech for the Next Generation Science Standards
 Elementary Extravaganza
 Engaging Students in Asking Meaningful Questions
 Engaging with Administrators - Starting Conversations About Supporting Science
 Engaging with Socio-Scientific Issues Through the Media
 Engineering - Literally!
 Engineerize Your Classroom: Integrate the NGSS Engineering Practices and Spice Up Your Lessons
 Enhancing Curriculum and Engaging Students Through Virtual Experiences
 Exploring Cosmic Gamma Rays in a High School Classroom
 Find the Fund\$ for STEM: Grant Writing 101
 Flipping MEECS: Using Existing Materials in a Next Gen Classroom
 FOCUS: Inspiring Exploration and Discovery while Reading, Writing, Thinking, and Doing
 Formative AS Using Tech Tools
 Get Out!: Taking Student Learning Outdoors
 Gettin' Googly in the Science Classroom
 Getting Students to Argue - Encouraging Discussion for All Students
 Go Play Outside? But Why? Nature Disconnect and Our Kids
 Grand Slam 3-D Assessment - Researchers, Developers, and Practitioners to Build Capacity, Develop Items, and Implement Strategically
 Great Lakes. Great Activity, Great Fun
 Greener, Safer, Better...CH Replacement Labs
 Growing Language and Science: A Garden of Effective Strategies
 Hands-on and Creative Teacher-Developed Invasive Species Lessons to Achieve Michigan Science Standards
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 How Do You Know What They Know? Putting the Students in Charge of Their Learning
 How to Facilitate Student Equitable Discourse in the Classroom
 Human Population: Past, Present and Future
 Impacts and Benefits of Construction and Removal of Dams
 Innovation Learning with The Henry Ford
 Invasive Engineering
 Learning Target in NGSS
 Make Time for Science with Project-Based Learning
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 Making Your NGSx Workshop Pop!
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 Phenomenon, Modeling, and Storyboards!
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 Powerful Tools for ALL Classrooms: Question Boards, Scientific Models, and Productive Talk!
 Practice the Science and Engineering Practices with FISH!
 Productive Talk Implementation: Year Two
 Project-based STEM Challenges for Elementary Students
 Proven Instructional Practices in STEM: Setting ALL Students up for Success
 Reading, Writing, Speaking and Listening in the Context of Science: Integrating Literacy and 3D Science Instruction
 Red Planet Pioneers: A Mission to Mars
 Requirements for Becoming a Certified Environmental Educator
 Science is a Verb, Not a Noun!
 Science with a Story-line
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 Stop Creating Lesson Plans: Start Creating Learning Experiences
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 Structuring Discussion to Be Equitable and Rigorous
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 Students Leading Change to Protect Our Waterways
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 Swimming in Great Lakes Fisheries Science Education Opportunity
 Take Your Students Outside to Engineer!
 Targeting Scientific Literacy
 Teaching With Trees - Using Schoolyard Trees to Teach Disciplinary Core Ideas
 The Mars Mini-Rover Project
 The Matrix, Fully Loaded: Sharing Best Practice in the Science Classroom
 The MiSTEM Network: Supporting Michigan's STEM Future
 The Question Formulation Technique: Teaching Students to Formulate Their Own Questions
 The Science and Engineering of Managing Waste
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 Using Phenomena to Drive Student Learning: Examples From a 5th Grade Classroom Using Next Generation Science Storylines
 Using S.T.E.M. to create Marble runs
 Using Virtual Experiences to Teach Weather in the Elementary Classroom
 VR in Your Classroom
 What's So Phenomenal about Phenomena?
 Who is Birdbrain Amos and What Does He Have to Do with the Hippo and Oxpecker?
 Wildlife CSI to Teach Claim, Evidence, Reasoning
 Writing in Science: Out of the Silo and Onto the Page
 You Can Teach TE, Yes? You!!

INTEREST LEVELS

MIDDLE SCHOOL

- Talking Science
- Why Make? A Maker Space Experience for Your Classroom
- A Focus on Constructing Written Explanations in the Phenomenon-Based Classroom
- A Lecture Style Lesson Where All Students Are Engaged? Yes, Please!
- Airbag Models: Applying Gas Laws in the Middle School Chemistry Classroom
- Are you Science Woke? How to Teach Science and Integrate Culturally Relevant Education
- Argument-Driven Inquiry in the Elementary School Classroom
- Argument-Driven Inquiry in the Middle School Classroom
- Art and Science in Nature
- Asking Questions and Planning and Conducting Experiments: Using the Question Formulation Technique
- BI At the Zoo
- Bioengineering Challenges and Middle School Life Science
- Biomedical Engineering: GET A GRIP!
- Building a Classroom Culture Through Routines
- Building a Model of Force as an Interaction
- Building Atomic Model of Matter and Conservation of Matter Concept
- Catching Up With Carp: Updates and Ideas on Incorporating Invasive Carp into Your Classroom
- Celebrate the 50th Anniversary of the Moon Landing!
- Cell Differentiation and Gene Expression
- Centering Out-of-School Knowledge in STEM-based Makerspaces
- Cholera Case Study Reunion
- Claim-Evidence-Reasoning: Scientific Explanations About Phenomena
- Climate Education Through Data Analysis
- Coding Science Supplies! BEGINNER FRIENDLY!
- Community Engagement in the Classroom
- Connecting Agriculture to NGSS
- Consensus Meetings in Science: Making Student Thinking Visible & Incorporating Student Voice
- Cool Demonstrations for Young Science Students Without Breaking the Bank
- Cut It, Stab It, Slice It, Dice It: Using the Potato in the Science Classroom
- Deconstructing CERs to Help Students Construct Explanations
- Defining Temperature
- Deliberating Climate Choices
- Demonstrations That Really Grab Attention!
- Demystifying 3D NGSS and STEM Literacy Using the Phenomenon of Light
- Designing Destructive Earthquakes
- Developing Science Process Skills Through Citizen Science & Schoolyard Investigations
- Diffusion, the Cell Membrane, and Ourselves: BI Comes Alive through the Aesthetic Realism Method
- Don't Reinvent the Wheel- Creating Inquiry Experiences for Students
- Earthquakes: Rock Your Student's World with NGSS!
- Easy Tech for the Next Generation Science Standards
- Empowered to Take Action: Engaging Environmental STEM Design Challenges with EarthEcho
- Energy Across the Content
- Engaging Evolution Resources to Deepen Learning
- Engaging Students in Asking Meaningful Questions
- Engaging with Socio-Scientific Issues Through the Media
- Engineering Design in the NGSS
- Exploring Cosmic Gamma Rays in a High School Classroom
- Exploring Energy Across the Disciplines
- Exploring Kinetic Energy Transfers in Collisions
- Find the Fund\$ for STEM: Grant Writing 101
- Five Phenomenon that Work in (almost) any Science Classroom
- Flipping MEECS: Using Existing Materials in a Next Gen Classroom
- Formative AS Using Tech Tools
- Free-Range Students: In the Field for Obtaining, Evaluating, and Communicating Information
- From Cookbook -> NGSS!
- Full STEAM Ahead
- Get Out!: Taking Student Learning Outdoors
- Gettin' Googly in the Science Classroom
- Getting Students Out of Their Seats
- Getting Students to Argue - Encouraging Discussion for All Students
- Getting Through the Modeling Cycle: Supporting Students in Sense-making of Phenomena in a PBL Life Science Curriculum
- Global Health Got Protein
- Going Nuclear!!!
- Grab Their Attention with Gizmos!
- Grading with Purpose: My Journey to Standards Based Grading
- Grand Slam 3-D Assessment - Researchers, Developers, and Practitioners to Build Capacity, Develop Items, and Implement Strategically
- Great Lakes. Great Activity, Great Fun
- Greener, Safer, Better...CH Replacement Labs
- Growing in 3D through the PLC
- Guiding Ecological Investigations: Students Learn Science Practices and the Nature of Science
- Head Full of STEAM
- Helping Students Use Systems Thinking in the Classroom and Everyday Life
- Helping Students with D=RxT
- High School Students Can Do AstroPH Too!
- How Fast is Your Brain? Easily Introduce Neuroscience to K-12 Science Classrooms
- How to Facilitate Student Equitable Discourse in the Classroom
- How To Get K-5 Students To Use SEP and CCC
- Human Population: Past, Present and Future
- Implementing the Shifts in the Next Generation Science Standards: Enacting The Sound Unit Through The Learning While Teaching Project Puts All The Pieces Together!
- Improving Canned Labs to Increase Ownership & Understanding of Experiments
- Incorporating Modeling Instruction with Mi-STAR
- Increasing Student Engagement by Modifying Tasks
- Innovation Learning with The Henry Ford
- Integrating STEM with Science
- Invasive Engineering
- Investigating Cell Structure and Function Beyond Paper Exercises!
- It Can Be Done! Easy Tools to Empower Students to Steer Their Own Learning
- Keynote - Transformative Teaching: Teachers as Agents of Change Learning Target in NGSS
- Lessons Learned: The Do's and Don'ts of STEM Service Learning Projects
- Literacy Fun in the Science Classroom: Add Some Pizzazz!
- Low Stakes AS: Provide a Low Risk Opportunity for Students to Assess Their Learning While Reducing Teacher Workload!
- Maker-space Design Thinking Challenge
- Making Good Chemistry with Industry Partnerships
- Making It Real... Cheap!
- Making Your NGSx Workshop Pop!
- Managing Group Talk & Teamwork
- Maps as Models in Earth and Environmental Science Classroom
- Materials Driven Inquiry
- May the Force Be With You
- Michigan's Frogs and Toads
- Mi-STAR From a Teacher Perspective: Q&A with Veteran Mi-STAR Teachers
- Mi-STAR Information Session
- Modeling Dynamic Systems Using InsightMaker.com
- Modeling in the Middle School Classroom
- Modeling Mysteries & What To Do With Them
- Modeling Science Practices and Standards Using Forensic Science
- Muffins for Members
- My Favorite HHMI Biointeractive Resources for Teaching Introductory BI
- National Geographic Geo-Inquiry Process
- Natural Communities of the Great Lakes: Applying NGSS to field based learning
- Never mind Strawberry Fields... Energy and Fields Forever
- NextGenPBL: Supporting Transition to MSS

NGSS ASs: How Will We Know They Are Learning?
 NGSS Chemical Reactions: Designing Better Chemical Batteries
 NGSS-aligned Water Quality Lessons for Middle School Grades from the Pathways to Science Teaching Program
 NSTA Enhanced eBooks+ Kids Collection
 Observations of How NGSS is Transforming Classrooms for Both Teachers and Students
 PASCO Solutions: The Most Comprehensive Laboratory Experience for the Student and Educator of Today
 Picture Perfect Science LE
 Power Your Classroom or School with Solar Energy - Student Driven Solar Productive Talk Implementation: Year Two
 Protecting Michigan Inland Lakes
 Radical Research
 Raising the Rigor in Your Science Classroom
 Reading, Writing, Speaking and Listening in the Context of Science: Integrating Literacy and 3D Science Instruction
 Real BI Teachers Take Kids Outside
 Reducing Stress and Enhancing Learning with Mindfulness
 Requirements for Becoming a Certified Environmental Educator
 Science and Art - Corpus Callosum - The Power of Collaborating with Art Teachers
 Science is a Verb, Not a Noun!
 Science Modeling: The Growing Pains and Gains of My First Year
 Science with a Story-line
 Seeing is Believing: PH Demonstrations to Energize Your Classroom
 Showcasing High School STEM Research
 Sink your Teeth into Science! Using Bite Mark Evidence to Teach Lab Skills and Logic
 STEAM Challenges: Creating Cross-curricular Events to Engage All Learners
 STEM Opportunities Beyond the Classroom
 STEM Teaching Tools 101
 Stop Creating Lesson Plans: Start Creating Learning Experiences
 Storytelling with a Twist
 Strategies to Scaffold Science Discussion in MS Classroom
 Strengthen STEM with Community Partnerships That Integrate Arts and Social Studies
 Structure and Function in Madagascar Hissing Cockroaches
 Structuring Discussion to Be Equitable and Rigorous
 Student AS: Standards Based Grading in a Three-Dimensional Classroom
 Students Leading Change to Protect Our Waterways
 Supporting Early Elementary Student Talk in Science
 Supporting Students in the Development and Revision of Models
 Supporting Students? Scientific Explanations with CER
 Sustainable Schools: How to Become a Michigan Green School
 Swimming in Great Lakes Fisheries Science Education Opportunity
 Take Your Students Outside to Engineer!
 Talking Science - sharing Ideas with Your Media Specialist
 Targeting Scientific Literacy
 Teaching With Trees - Using Schoolyard Trees to Teach Disciplinary Core Ideas
 The 7E Model in the Gifted Science Classroom
 The Environmental Education (EE) Project
 The Genetics and Bioethics of Opioid Addiction and Treatment!
 The Matrix, Fully Loaded: Sharing Best Practice in the Science Classroom
 The MiSTEM Network: Supporting Michigan's STEM Future
 The Question Formulation Technique: Teaching Students to Formulate Their Own Questions
 The Science and Engineering of Managing Waste
 The Science of Maple Sugaring
 The T in STEM
 The Unbearable Dilemma
 The use of Collaborative Inquiry in the Secondary Science Materials Adoption Process
 Transformed Microscopy
 Transforming Students to Stewards: Fostering Great Lakes-Literacy in Schools
 Turning Chem Labs into STEM Labs
 Tweaking ASs for NGSS

Understanding Fields & Energy
 Unpack 3-Dimensional Standards with Phenomenal Science Instruction
 Use the NGSS Engineering Practices to Make Curriculum Decisions
 Using (free) NGSS-Aligned Carbon TIME units in MS/HS
 Using Anchoring Phenomena and Driving Question Boards to Spark Student Questioning
 Using Arduino-based Sensors on Nanosatellites to Engage Middle and High School Students with Science and Coding
 Using Debate to Assess Model Based Learning
 Using Design and Build projects to Teach NGSS Science and Engineering Practices
 Using Phenomena to Drive Student Learning
 Using Phenomena to Drive Student Learning: Examples from a 5th Grade Classroom Using Next Generation Science Storylines
 Utilizing Virtual Experiences to Teach Geography in the Elementary Classroom
 VR in Your Classroom
 Water Quality: Developing Citizen Scientists
 What if the Graduation Requirements Do Not Make Sense for Our Students?
 What's So Phenomenal About Phenomena?
 Wildlife CSI to Teach Claim, Evidence, Reasoning
 Writing in Science: Out of the Silo and Onto the Page
 You Can Do It... Science in the EE Classroom

HIGH SCHOOL

Lesson Planning: Science Curriculum Towards Engineering Design Process
 Talking Science
 5 Days that Changed my Life: Coding in the Science Classroom
 A Lecture Style Lesson Where All Students Are Engaged? Yes, Please!
 Active Programs
 Aquaculture Challenge: Engaging Students with Fish, Plants, and So Much More!
 Are You Science Woke? How to Teach Science and Integrate Culturally Relevant Education
 Argument-Driven Inquiry in the Elementary School Classroom
 Argument-Driven Inquiry in the High School Classroom
 Asking Questions and Planning and Conducting Experiments: Using the Question Formulation Technique
 BI Modeling
 Biomedical Engineering: GET A GRIP!
 Biomes and Invasive Species
 Building a Model of Force as an Interaction
 Building Atomic Model of Matter and Conservation of Matter Concept
 Catching Up With Carp: Updates and Ideas on Incorporating Invasive Carp into Your classroom
 Cell Differentiation and Gene Expression
 Centering Out-of-School Knowledge in STEM-based Makerspaces
 CH Teacher Meeting
 Charts & Diagrams & Graphs, Oh My!
 Chemical Formula & Amino Acids
 Claim-Evidence-Reasoning: Scientific Explanations about Phenomena
 Climate Education Through Data Analysis
 Coding Science Supplies! BEGINNER FRIENDLY!
 Community Engagement in the Classroom
 Connecting Agriculture to NGSS
 Consensus Meetings in Science: Making Student Thinking Visible & Incorporating Student Voice
 Cut It, Stab It, Slice It, Dice It: Using the Potato in the Science Classroom
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 Demonstrations That Really Grab Attention!
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 Designing Destructive Earthquakes
 Developing Science Process Skills through Citizen Science & Schoolyard Investigations
 Diffusion, the Cell Membrane, and Ourselves: BI Comes Alive through the Aesthetic Realism Method
 Don't Reinvent the Wheel- Creating Inquiry Experiences for Students

INTEREST LEVELS

HIGH SCHOOL *continued*

- Earthquakes: Rock Your Student's World with NGSS!
Easy Tech for the Next Generation Science Standards
Ecological Impacts - Using Place-based Stewardship to Engage Students as Citizens of Their Environment
Empowered to Take Action: Engaging Environmental STEM Design
Challenges with EarthEcho
Energy Across the Content
Engaging Students in Asking Meaningful Questions
Engaging with Socio-Scientific Issues Through the Media
Engineering the Future
Expanding STEM: Developing Partnerships
Exploring Cosmic Gamma Rays in a High School Classroom
Exploring Energy Across the Disciplines
Find Out More About Mber - Model Based BI
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Five Phenomenon that Work in (almost) Any Science Classroom.
Formative AS Using Tech Tools
Free modeling tools for the Michigan Science Standards
Free Teacher Resources to Support the Use of Physical and Life Science
Online 3-dimensional AS Tasks
Free-Range Students: In the Field for Obtaining, Evaluating, and Communicating Information.
From Cookbook -> NGSS!
From Students to Stewards: Leading Students to Plan and Enact Stewardship Action Projects
Gamification in the BI Classroom
Get Out!: Taking Student Learning Outdoors
Getting Students Out of Their Seats
Getting Students to Argue - Encouraging Discussion for All Students
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Global Health Got Protein
Going Nuclear!!!
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Making Your NGSSx Workshop Pop!
Maps as Models in Earth and EN Classroom
May the Force Be With You
Michigan's Frogs and Toads
Michigan's Teacher Recognition Programs
Missed Connections: Reuniting Alternative Students with Their Environment Through a Cross-curricular Day in the Field
Mi-STAR Information Session
Modeling Dynamic Systems Using InsightMaker.com
Modeling Mysteries & What To Do With Them
Modeling Science Practices and Standards Using Forensic Science
Muffins for Members
My Favorite HHMI Biointeractive Resources for Teaching Introductory BI
Mystery of Liquids
Natural Communities of the Great Lakes: Applying NGSS to Field Based Learning
Never mind Strawberry Fields... Energy and Fields Forever
NextGenPBL: Supporting Transition to MSS
NGSS ASs: How Will We Know They Are Learning?
NGSS Chemical Reactions: Designing Better Chemical Batteries
NSTA Enhanced eBooks+ Kids Collection
Observations of How NGSS is Transforming Classrooms for Both Teachers and Students
Particulate Drawings and Manipulatives
PASCO Solutions: The Most Comprehensive Laboratory Experience for the Student and Educator of Today
PBL, Multi-Discipline Integration, and NGSS...Oh my! Can it be done? We Share How!
Photosynthesis and Respiration Shuffle
Power Your Classroom or School with Solar Energy - Student Driven Solar
Productive Talk Implementation: Year Two
Promoting STEM with a STEM Society
Prospecting for Mineral Ore
Protecting Michigan Inland Lakes
Putting the Pieces Together-BI Sequencing and Units
Radical Research
Raising the Rigor in Your Science Classroom
Reading, Writing, Speaking and Listening in the Context of Science: Integrating Literacy and 3D Science Instruction
Reducing Stress and Enhancing Learning with Mindfulness
Remote Control Air Cannon and Internet of Things (IoT)- The Engineering Design Process- What We Learned at RET (Research Experience for Teachers) at Central Michigan University and How You Can Do the Same? Science in Service
Seeing is Believing: PH Demonstrations to Energize Your Classroom
Showcasing High School STEM Research
Silver Nanoparticles Make and Take
Sink your Teeth into Science! Using Bite Mark Evidence to Teach Lab Skills and Logic
STEAM Challenges: Creating Cross-curricular Events to Engage All Learners
STEM Opportunities Beyond the Classroom
Stop Creating Lesson Plans: Start Creating Learning Experiences
Storytelling with a Twist
Strategies to Promote Student Engagement in Young Adults
Strengthen STEM with Community Partnerships That Integrate Arts and Social Studies
Structure and Function in Madagascar Hissing Cockroaches
Structuring Discussion to Be Equitable and Rigorous
Student AS: Standards Based Grading in a Three-Dimensional Classroom
Students Leading Change to Protect Our Waterways
Supporting Students in the Development and Revision of Models
Sustainable Schools: How to Become a Michigan Green School
Swimming in Great Lakes Fisheries Science Education Opportunity
Take Your Students Outside to Engineer!
Taking the Fear Out of Using Statistics in the BI Classroom Using HHMI Biointeractive Resources
Targeting Scientific Literacy
Teaching Climate Change Standards in BI
Ten Tips for Motivating Students with Phenomena
The Environmental Education (EE) Project
The Genetics and Bioethics of Opioid Addiction and Treatment!
The Matrix, Fully Loaded: Sharing Best Practice in the Science Classroom
The MiSTEM Network: Supporting Michigan's STEM Future
The NGSS Teaching Shift: Mber (Model Based BI) Will Ignite You!!
The Power of the NGSSx Experience in My Classroom

The Question Formulation Technique: Teaching Students to Formulate Their Own Questions
The Science of Maple Sugaring
The T in STEM
The use of Collaborative Inquiry in the Secondary Science Materials Adoption Process
Transformed Microscopy
Transforming Students to Stewards: Fostering Great Lakes-Literacy in Schools
Turning Chem Labs into STEM Labs
Tweaking ASs for NGSS
Understanding Fields & Energy
Unpack 3-Dimensional Standards with Phenomenal Science Instruction
Use the NGSS Engineering Practices to Make Curriculum Decisions
Using (free) NGSS-Aligned Carbon TIME units in MS/HS
Using Anchoring Phenomena and Driving Question Boards to Spark Student Questioning
Using Arduino-based Sensors on Nanosatellites to Engage Middle and High School Students with Science and Coding
Using Computational Thinking Practices to Create Better Problem Solvers!
Using Phenomena to Drive Student Learning
Utilizing Virtual Experiences to Teach Geography in the Elementary Classroom
VR in Your Classroom
What if the Graduation Requirements Do Not Make Sense for Our Students?
Wildlife CSI to Teach Claim, Evidence, Reasoning
Writing in Science: Out of the Silo and Onto the Page
You Can Do It... Science in the EE Classroom

POST SECONDARY

5 Days that Changed my Life: Coding in the Science Classroom
A Lecture Style Lesson Where All Students Are Engaged? Yes, Please!
Argument-Driven Inquiry in the Elementary School Classroom
Building a Model of Force as an Interaction
Catching Up With Carp: Updates and Ideas on Incorporating Invasive Carp into Your classroom
Charts & Diagrams & Graphs, Oh My!
Climate Education Through Data Analysis
Coding Science Supplies! BEGINNER FRIENDLY!
Demonstrations That Really Grab Attention!
Designing Destructive Earthquakes
Developing Science Process Skills Through Citizen Science & Schoolyard Investigations
Do You Want to Build a Greenhouse?
Don't Reinvent the Wheel- Creating Inquiry Experiences for Students Energy Across the Content

Find the Fund\$ for STEM: Grant Writing 101
Getting Students Out of Their Seats
Getting Through the Modeling Cycle: Supporting Students in Sense-making of Phenomena in a PBL Life Science Curriculum
Global Health Got Protein
Grading with Purpose: My Journey to Standards Based Grading
Great Lakes. Great Activity, Great Fun
How fast is your brain? Easily introduce Neuroscience to K-12 Science Classrooms
Investigating Cell Structure and Function Beyond Paper Exercises! Lab Reports can be Fun!
Lessons Learned: The Do's and Don'ts of STEM Service Learning Projects
Low Stakes AS: Provide a Low Risk Opportunity for Students to Assess Their Learning While Reducing Teacher Workload!
May the Force Be With You
Modeling Mysteries & What To Do With Them
NextGenPBL: Supporting Transition to MSS
NGSS Chemical Reactions: Designing Better Chemical Batteries
NGSS-aligned Water Quality Lessons for Middle School Grades from the Pathways to Science Teaching Program
Observations of How NGSX is Transforming Classrooms for Both Teachers and Students
Radical Research
Seeing is Believing: PH Demonstrations to Energize Your Classroom
STEAM Challenges: Creating Cross-curricular Events to Engage All Learners
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Transformed Microscopy
Turning Chem Labs into STEM Labs
Unpack 3-Dimensional Standards with Phenomenal Science Instruction
Using Anchoring Phenomena and Driving Question Boards to Spark Student Questioning

MTSA REGION DIRECTORS

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Crosswell, MI 48422
jlzrichmond@gmail.com

Region 10 Director - Carolyn Mammen

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Traverse City, MI 49684
cmammen@charter.net

Region 11 Director

Position currently vacant

Region 12 Director - Sarah Geborkoff

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Region 13 Director - Chris Standerford

Northern Michigan University
401 Presque Isle, West Science 2805
Marquette, MI 49855
cstander@nmu.edu

Region 14 Director - Lynn Thomas

Escanaba High School
500 S. Lincoln Road
Escanaba, MI 49837
lynnthomas@eskymos.com

AWARD WINNERS

NOTE: This is only a list of the last five years of award winners. For a full list of the award winners since 1974, contact the MSTA office.

2015

Teacher of Promise _____	Ashley Meyer
Elementary Science Teacher of the Year _____	Patricia McNinch
Middle School Science Teacher of the Year _____	Holly McGoran
High School Science Teacher of the Year _____	Deanna Cullens
College Science Teacher of the Year _____	Dr. Bradley Ambrose
Administrator of the Year _____	Greg Johnson
Informal Science Educator _____	Stephen Stewart
Distinguished Service Award _____	Betty Crowder
The George G. Mallinson Award _____	David Bydlowski
Dan Wolz Clean Water Education Grant _____	John Travis/Josh Nichols

2016

Teacher of Promise _____	Dakota Bahlau
Teacher of Promise _____	Paula Gentile
Elementary Science Teacher of the Year _____	Sherri Hane
Middle School Science Teacher of the Year _____	Colleen Polydoros
High School Science Teacher of the Year _____	Joshua Barclay
College Science Teacher of the Year _____	Dr. Mark Francek
Informal Science Educator _____	Janet Vail
MSTA Special Award _____	Stephen Best
Distinguished Service Award _____	Cheryl Hach
The George G. Mallinson Award _____	Jacqueline and George Mallinson
Dan Wolz Clean Water Education Grant _____	Connie Atkisson and Lea Sevigny

2017

Teacher of Promise _____	Hadley Brill
Elementary Science Teacher of the Year _____	Robert Thomson
Middle School Science Teacher of the Year _____	Leigh Ann Roehm
High School Science Teacher of the Year _____	Scott Milam
College Science Teacher of the Year _____	Dr. Janet Vigna
Administrator of the Year _____	Thomas Ten Brink
Informal Science Educator _____	Brandon Schroeder
MSTA Special Award _____	Sue Campbell
Distinguished Service Award _____	Conni Crittenden

2018

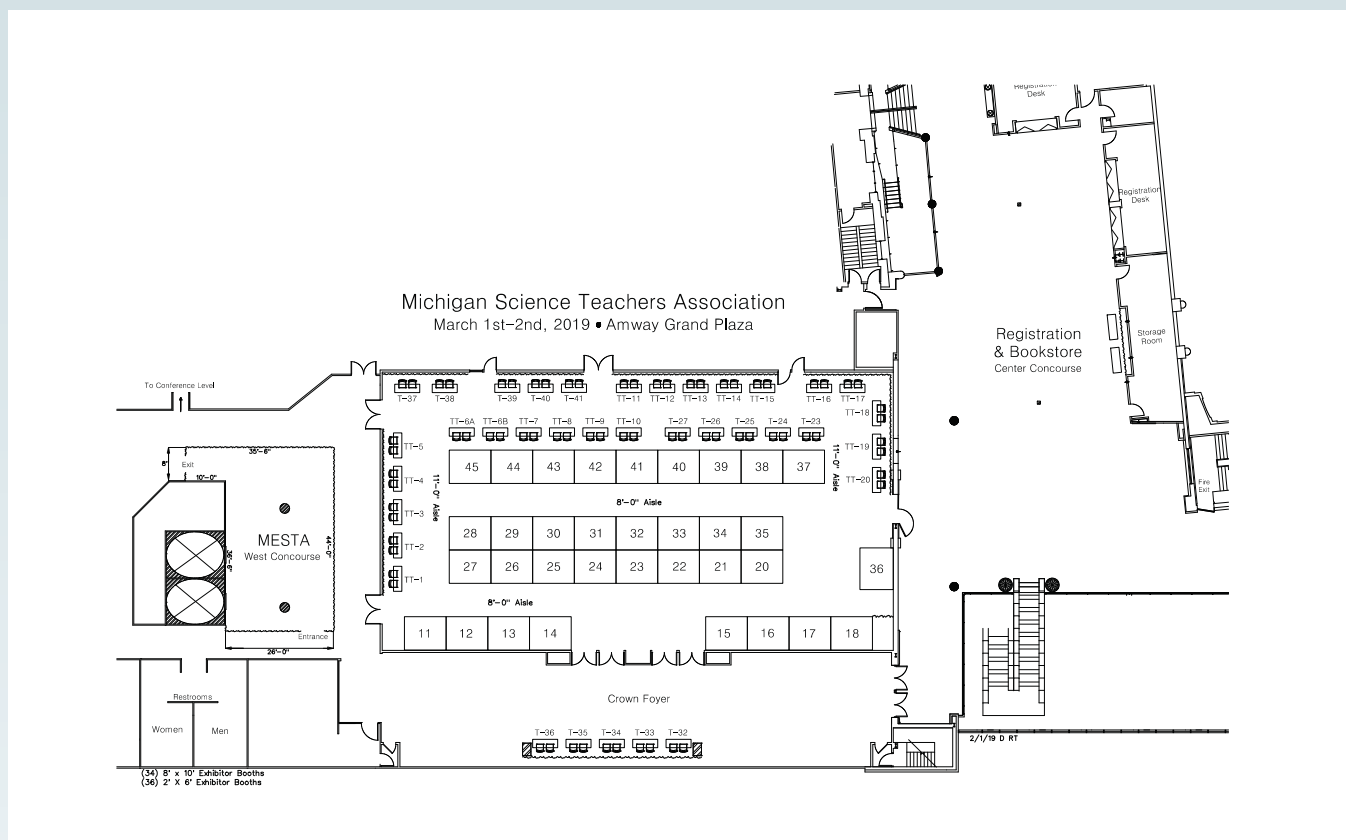
Teacher of Promise _____	Nathan Hatt
Middle School Science Teacher of the Year _____	Jean Buller
High School Science Teacher of the Year _____	Anne Jeannette LaSovage
College Science Teacher of the Year _____	Dr. Brian DeJong
Administrator of the Year _____	Heidi Mercer
Informal Science Educator _____	Tracy D'Augustino
Distinguished Service Award _____	Liz Larwa
The George G. Mallinson Award _____	Deborah Peek- Brown

2019

Teacher of Promise _____	Emily Cizmas
Elementary School Science Teacher of the Year _____	Katie Stevenson
Middle School Science Teacher of the Year _____	Jeff Bouwman
High School Science Teacher of the Year _____	Holly Hereau
College Science Teacher of the Year _____	Dr. Stephen Rybczynski
Administrator of the Year _____	Dr. Adam Spina
Informal Science Educator _____	Claire Lannoye - Hall
Distinguished Service Award _____	Jeffrey C. Conn
The George G. Mallinson Award _____	Jacqueline Huntoon
Dan Wolz Clean Water Education Grant _____	Carolyn Mammen and Chelsea Bender

EXHIBITOR INFORMATION

Amway Grand Plaza Hotel - Ambassador Ballroom



Activate Learning Booth #: Thornapple Room

Cynthia Weller
134 6th Ave
LaGrange, IL 60525
708.205.5691
cweller@activatelearning.com

Activate Learning is a leader in research-based, K-14 STEM curricula. Our project-based, investigation-centered and literacy-rich programs immerse students in rigorous learning environments in which their original questions and everyday experiences are central to standards-based, 3D learning in either print or interactive digital format.

American Chemical Society Booth #: T 37

William Winchester
1315 Milton St. SE
Grand Rapids, MI 49506
P: 616-901-8624
E: winchesr@gvsu.edu

The American Chemical Society seeks to advance the broader chemistry enterprise and to improve people's lives through the transforming power of chemistry.

Amplify Booth #: 23

Mindi Jones
13505 Camp Comfort Lane
Howell, MI 48843
734.740.2169
mpaupore@amplify.com

A pioneer in K-12 education since 2000, Amplify is leading the way in next-generation curriculum and assessment.

Arbor Scientific Booth #: 44/45

Sebastian Jolta
PO Box 2750
Ann Arbor, MI 48106
734.239.3651
sebastian@arborsci.com

Based in Michigan, Arbor Scientific is a leading provider for Physics and Physical Science teaching equipment tested and approved by educators recognized by their expertise.

Backyard Brains

Booth #: 13

Greg Gage
308 1/2 S.State Street
Ann Arbor, MI 48104
1 (855_438-7745
gagereg@backyardbrains.com

We develop DIY tools which allow students to perform real neuroscience experiments, which make university labs and introductory research more affordable, and which can be used to get the public excited about neuroscience.

Battle Creek Outdoor Education Center

Booth #: TT 13

Matthew Santner
10160 S. M-37 Highway
Dowling, MI 49050
269-721-8161
oecevents@battle-creek.k12.mi.us

The Battle Creek Outdoor Education Center offers both residential and day programs.

Benz Microscope Optics Center, Inc.

Booth #: 12

Michael L. Benz
3980 Varsity Dr.
Ann Arbor, MI 48108
(734) 994-3880
benzmicroscope@aol.com

Sales and service of microscopes and sales of laboratory supplies.

Bio-Rad Explorers

Booth #: 29

Marisol Gabriel
225 Linus Pauling Dr.
Hercules, CA 94547
P: 510-741-6968
E: marisol-gabriel@bio-rad.com

Bio-Rad's Explorers program supports teachers in their quests to provide cutting-edge life science to classrooms to improve transformational moments for both teachers and students.

Capstone Classroom

Booth #: 21

John Whitney
2046 Serra Dr
Sterling Heights, MI 48310-5246
(586)850-2255
john@whitneyed.com

Helping children develop a love of learning and reading, no matter their ability level, is at the heart of what we do at Capstone.

Cedar Point

Booth #: 14

Marcie Sandine
1 Cedar Point Drive
Sandusky, OH 44870
(419)627-2217
marcie.sandine@cedarpoint.com

Cedar Point in Sandusky, Ohio is home to 70 rides, including the new Steel Vengeance coaster, three kids' areas, live shows, hotels and more.

Central Michigan University Biological Station

Booth #: T 24

John Gordon
ET 200 Central Michigan University
Mt. Pleasant, MI 48859
989-774-4400
gordo2jj@cmich.edu

Central Michigan University Biological Station on Beaver Island. Learning opportunities for high school students and science teachers.

Cereal City Science

Booth #: 27

Cindy Older
201 W. Michigan Ave
Battle Creek, MI 49017
269.213.3824
cindy@bcamsc.org

Cereal City Science (BCAMSC) supports K-MS educators and students with curricula and professional development with NGSS and CCSS. The research-based program proves STEM instruction where students are engaged in phenomena and problem solving.

EXHIBITOR INFORMATION

Delta Education

Booth #: 4

Mark Esstman
115 Saddlegate Ct.
Winston-Salem, NC 27106
P: 338-934-2919
E: mark.esstman@schoolspecialty.com

Delta Education has been your leader in hands-on science for over 30 years.

DNR Outdoor Adventure Center

Booth #: TT 1

Natalie Cypher
1801 Atwater St
Detroit, MI 48207
313.396.6874
cyphern@michigan.gov

The Outdoor Adventure Center is a hands-on facility focusing on Michigans' natural resources and recreation opportunities. We offer field trips and classes for all grade levels.

Engineering is Elementary

Booth #: TT 14

Jill Olsen
1 Science Parr
Boston, MA 02114
617.589.3103
kasquith@mos.org

EiE is an award-winning program of the Museum of Science, Boston. We design engineering curriculum materials, resources, and teacher professional development to help create a generation of problem solvers.

ExploreLearning

Booth #: 36

Abby Dogum
110 Avon Street, Suite 300
Charlottesville, VA 22902
1.866.882.4141
adogum@explorellearning.com

ExploreLearning develops online solutions to improve learning in math and science including - Gizmos -online simulations for math and science, grades 3-12, and Reflex -a power math fact fluence solution

Gift of Life Michigan

Booth #: TT 12

Alison Gillum
8115 Engelhurst Dr.
Jenison, MI 49428
616-915-0679
agillum@golm.org

Gift of Life is the designated organ and tissue recovery program for the state of Michigan. We offer a free education program for High School students that teaches about the transplantable organs and tissues as well as the process of donation.

Grand Rapids Public Museum

Booth #: 40

Rebecca Kenny
272 Pearl St. NW
Grand Rapids, MI 49504
616-929-1700
rkenny@grpm.org

The GRPM is the oldest and second largest museum in Michigan. It is a place of neverending inspiration and discovery with a focus on science and culture.

Houghton Mifflin Harcourt

Booth #: 32

Sara Edlemery
125 High St. Suite 900
Boston, MA 02110
P: 617-351-3058
E: sara.edlemery@hnhco.com

Houghton Mifflin Harcourt provides pre-K - 12 education content, services, and cutting-edge technology solutions across a variety of media to enable learning in a changing landscape.

Inland Seas Education Association

Booth #: TT 10

Stephanie Rustem
PO Box 218 100 Dame Street
Suttons Bay, MI 49682
231.271.3077
srustem@schoolship.org

ISEA's mission is to inspire Great Lakes curiosity, stewardship, and passion. Students learn about our traditionally-rigged tall ship schooners in Northern Michigan.

IntegraSource

Booth #: 33

Julie Lappenga
PO Box 197
Caledonia, MI 49316
P: 616-893-9389
E: julianne@integra-source.com

IntegraSource represents several publishers of high quality science materials to meet your science education needs.

IQhub

Booth #: TT 11

Emily Crambell
3055W. M-21
St. Johns, MI 48879
P: 989-224-3299
E: emily.crambell@agroliquid.com

The IQhub offers free science field trips for all ages!!! Pre-K to college students will have a fun learning experience!

John Ball Zoo

Booth #: T 23

Rhiannon Mulligan
1300 Fulton St. West
Grand Rapids, MI 49504
P: 616-336-4300
E: rmulligan@jbzoo.org

Founded in 1891, John Ball Zoo inspires the community to be actively engaged in the conversation of wildlife and our natural environment

Lab-Aids

Booth #: 28

Bill Cline
9323 Sailwind Dr
Ft Wayne, IN 46804
260.273.0815
bcline@lab-aids.com

LAB-AIDS produces the SEPUP (Science Education for Public Understanding Program) which began developing science instruction materials with funding from the National Science Foundation (NSF) in 1987.

Lawrence Technological University

Booth #: 39

Jane Franco
21000 West 10 Mile Road
Southfield, MI 48075
248.204.3178
JFRANKO@LTU.EDU

Lawrence Technological University offers over 100 programs in colleges of Architecture and Design, Arts and Sciences, Engineering and Business, and Information Technology.

Learning A-Z

Booth #: 37

Ann Bridges
1840 E River Rd, Suite 320
Tucson, AZ 85718
520.999.3863
ann.bridges@learningaz.com

Science A-Z for K-6 blends the core ideas and practices of science with language arts to seamlessly integrate science and literacy into daily instruction.

Mallinson Institute for Science Education

Booth #: 42

Kathleen Drzewiecki
1903 W. Michigan Avenue
Kalamazoo, MI 49008-5444
(269)387-5398
kathleen.drzewiecki@wmich.edu

The Mallinson Institute for Science Education at WMU exists to advance knowledge through research to improve the teaching and learning of science, in and out of the classroom.

McGraw-Hill Education

Booth #: 15/16

Colleen Mattox
8787 Orion Place
Columbus, OH 43240-4027
(614) 430-4709
colleen.mattox@mheducation.com

We are a digital learning experiences company intent on changing the world of education. Visit us at mheducation.com

EXHIBITOR INFORMATION

MDHHS- MiTracking

Booth #: TT 5

Celeste Bavin
2364 Woodlake Dr. Suite 180
Okemos, MI 48864
517-324-7392
floridaj@michigan.gov

MiTracking helps bridge the knowledge gap between environmental hazards and public health. MiTracking gathers existing Michigan-specific data and provides them in one online location.

Meemic Insurance

Booth #: 41

Rink Pinkos
725 S. Adams Rd. Suite 230
Birmingham, MI 48009
248-594-5700
rick@mymeemic.com

Meemic Insurance provides insurance exclusively for teachers and all school employees with special rates for auto, home, renters, boat and more.

MESTA (Michigan Earth Science Teacher Association)

Booth #: West Concourse

Lisa Bouda
bouda90@comcast.net

Michigan Agriculture in the Classroom

Booth #: T 27

Michelle Blodgett
7373 W. Saginaw
Lansing, MI 48917
P: 517-679-5969
E: mblodge@michfb.com

Michigan Agriculture in the Classroom is a program funded by the Foundation for Agriculture at Michigan Farm Bureau that focuses on K-12 agriculture education.

Michigan Alliance for Environmental and Outdoor Education (MAEOE)

Booth #: TT 4

Brittany Burgess
PO Box 51235
Livonia, MI 48151
brchunn@umich.edu

MAEOE is a nonprofit organization for formal and nonformal educators promoting environmental and outdoor education.

Michigan Antibiotic Resistance Reduction Coalition

Booth #: TT 18/19

Elaine Bailey
49632 Nautical Drive
Chesterfield Township, MI 48047
586-201-4047
elainebailey@mi-marr.org

The Michigan Antibiotic Resistance Reduction Coalition seeks to improve the use of antibiotics, thereby positively impacting our state antibiotic resistance rates and reducing side effects.

Michigan Chemistry Council

Booth #: T 41

John Dulmes
326 West Ottawa Street
Lansing, MI 48933
517.372.8898
info@michiganchemistry.com

The Michigan Chemistry Council is the statewide organization for the chemical industry and works to promote awareness of industry innovations, careers and resources.

Michigan Department of Education

Booth #: T 35

Vonda Combs
608 Allegan St.
Lansing, MI 48933
P: 517-241-4285
E: combsv@michigan.gov

State of Michigan Department of Education

Michigan Department of Environmental Quality

Booth #: TT 9

Tom Occhipinti
525 W Allergan St
Lansing, MI 48909
517.284.6867
occhipintit@michigan.gov

The Michigan Department of Environmental Quality promotes wise management of Michigan's air, land and water resources to support a sustainable environment, healthy communities, and vibrant economy.

Michigan DNR

Booth #: TT 2/3

Kevin Frailey
525 W. Allegan
Lansing, MI 48933
517.974-7941

fraileyk@michigan.gov

The Michigan DNR provides professional development, school outreach and materials to educators across MICH.

Michigan Future Problem Solving Program

Booth #: T 38

Lindsey Stewart
4815 Applecroft Ln.
Holt, MI 48842
P: 989-666-3306
E: michiganfps.org

Michigan Future Problem Solving Program provides creative problem solving activities for students K-12 spanning a variety of disciplines and content areas.

Michigan Science Center

Booth #: T 40

Paulette Epstein
5020 John R St.
Detroit, MI 48202
313-577-8400
paulette.epstein@mi-sci.org

The Michigan Science Center located in Midtown Detroit has over 250 hands-on exhibits, 2 theaters and 2 stages where we inspire curious minds of all ages to think more deeply about STEM.

Midland Center for the Arts

Booth #: TT 7

Jennifer Kanyo
1801 W. St. Andrews Rd.
Midland, MI 48640
989-631-5930
kanyo@midlandcenter.org

The Midland Center for the Arts provides meaning and connection to the arts, sciences, and local history through programming, outreach, classes and shows.

MiniOne Systems

Booth #: 24

Mindy Lee-Olsen
7738 Arjons Dr.
San Diego, CA 92126
858-684-3190
midy_leeolsen@theminione.com

MiniOne Systems provides affordable, reliable, fast and safe electrophoresis PCR systems and lab kits for hands on bioscience labs for middle and schools.

MiSTEM Network

Booth #: T 36

Meagan Schrauben
201 N. Washington Square, Victor Office Center, 5th Floor
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E: schraubenm1@michigan.gov

The MiSTEM Network is a state and regional support structure that leverages public and private partnerships to strengthen STEM education and workforce talent systems.

MSTA

Booth #: T 32, Crown Foyer

MSTA Bookstore

Booth #: T 33, Crown Foyer

NASCO

Booth #: 22

Sarah Feirn
901 Janesville Ave.
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sfeirn@nasco.com

For over 75 years, Nasco has made a commitment to provide quality teaching aids, reliable service, realistic pricing and most importantly, customer satisfaction. Known as the "Science Teacher's Favorite Catalog", Nasco offers supplies for a full-line science curriculum, including many items developed by Nasco and sold only through our catalog. Please visit us at eNasco.com or call 1-800-558-9595.

EXHIBITOR INFORMATION

National Geographic/Cengage

Booth #: 43

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E: karen.everts@cengage.com

National Geographic Learning, a part of Cengage, provides quality PreK-12 Academic, and Adult Education instructional solutions for reading, writing, science, math, social studies, ESL/ELD, Spanish/Dual language, Advanced & Electives, Career & Technical Ed

NSTA

Booth #: T 34, Crown Foyer

Rick Bounds/Danae Wirth
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Arlington, VA 22201
703.312.9210
rbounds@nsta.org

The National Science Teachers Association provides resources and PD opportunities for science educators of all ages and is a leading advocate for quality science education.

OFFICIAL Driving School

Booth #: 26

Diane Attallah
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Royal Oak, MI 48067
248.506.1199
diane@officialdrivingschool.com

OFFICIAL Driving School recruits teachers to become driving instructors in the classroom and behind the wheel. We also pride ourselves in providing the # 1 experience in driver's education.

Orion's Quest

Booth #: TT 6b

Pete Lawrie
1034 W. Ann Arbor Trl
Plymouth, MI 48170
734-546-0556
bhuffmaster@orionsquest.org

We work with world-class researchers that are conducting experiments aboard the International Space Station and bring their work into the classrooms FREE OF CHARGE.

PASCO Scientific

Booth #: 17

Julie Thomas
10101 Foothills Blvd
Rosenville, CA 95747
916.300.5527
jthomas@pasco.com

PASCO has been designing, developing, and supporting innovative teaching and learning solutions for K-12 and higher education since 1964. PASCO's team of educators is committed to the advancement of STEM education around the world.

Pearson

Booth #: 18

Vianey Suarez
1900 E. Lake Ave.
Glenview, IL 60025
847486-2095
vianey.cesareo@pearson.com

Pearson partners with educators to deliver new personalized ways of learning through effective scalable assessments, instructional tools, and technologies.

Potter Park Zoo

Booth #: TT 16/17

Jennifer Horvatin
1301 S Pennsylvania Ave
Lansing, MI 48912
517.342.2713
jhorvatin@ingham.org

Potter Park Zoo is an escape to nature in the heart of Michigan's capital city. Open year round and home to over 600 animals!

Scholastic Library Publishing

Booth #: 31

Laureen Bowman
35460 Heritage Lane
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248-474-6527
laureen@archieassociates.com

Scholastic Library Publishing is the publisher of Science FLIX, aligned to NGSS, Trueflix and Go with curriculum driven leveled science content.

Square One Education Network

Booth #: TT6a

Barb Land

barb@squareonenetwork.org

The Square One Education Network is a Michigan based educational non-profit focused on providing hands-on, experiential STEM projects for K-12 teachers and students including unique professional development workshops and student engineering competitions.

STEMscopes

Booth #: 11

Javier Encinas

5177 Richmond Ave.

Houston, TX 77056

rflores@acceleratelearning.com

Stemscopes™, created by Accelerate Learning Inc, is an award-winning, research-based national leader in PreK-12 STEM curriculum. Used by over 4M students across all 50 states.

Tamarack Adventure & Retreat Center

Booth #: T 39

Mark Noble

6735 Telegraph Rd. Suite 380

Bloomfield Hills, MI 48301

248-996-7518

noble@tamarackcamps.com

Tamarack Adventure and Retreat Center programs build confidence, leadership and teamwork through experiential education opportunities, all at camp in Ortonville, Michigan.

TCI

Booth #: 35

Thoa Tran

2440 W. El Camino Real, Suite 400

Mountain View, CA 94040

(650) 390-6600

ttran@teachtci.com

TCI's Bring Science Alive! Was designed with one primary goal: to help students master three-dimensional learning set forth by NGSS.

The Henry Ford

Booth #: TT 8

Lucie Howell

20900 Oakwood Blvd.

Dearborn, MI 48124

313-982-6105

lucieh@thehenryford.org

Using The Henry Ford's Archives of American Innovation, THF's Learning and Engagement team engages all learners by developing experiences, leading professional development, and building curricula.

The Markerboard People

Booth #: 20

Jason Lightner

1611 N. Grand River PO Box 80560

Lansing, MI 48906

(800) 379-3727

feedback@dryerase.com

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Van Andel Education Institute

Booth #: TT 15

Temple Rosenberger

VAEL 333 Bostwick Ave NE

Grand Rapids, MI 49503

616.234.5484

temple.rosenberger@vaei.org

VAEI is a nonprofit organization dedicated to creating classrooms where curiosity, creativity, and critical thinking thrive. We help educators engage students in authentic learning experiences.

Vernier Software & Technology

Booth #: 25

Angie Harr

13979 SW Millikah Way

Beaverton, OR 97005

888-837-6437

aharr@vernier.com

Vernier creates easy-to-use science interfaces, sensors, and graphing/analysis software. Vernier's technology-based solutions enhance STEM education, increase learning, and build students' critical thinking skills.

Wayne State University

Booth #: 30

Jeff Conn

666 W. Hancock

Detroit, MI 48201

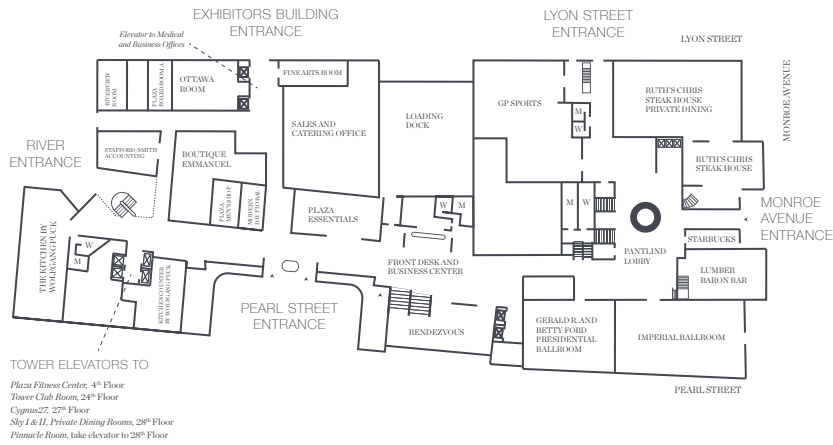
P: 313-557-7816

E: jconn@sun.science.wayne.edu

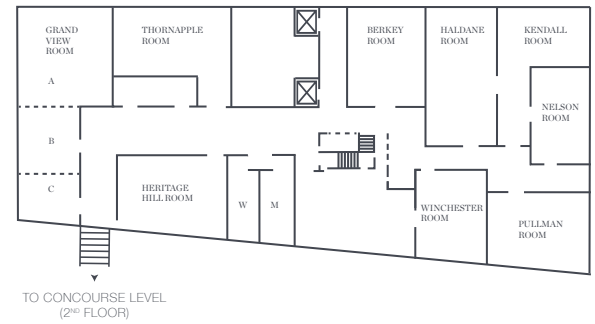
Wayne State University- The College of Liberal Arts & Sciences, will have information on their programs for K-12 science teachers and school administrators. Stop by and check them out!

Amway Grand Plaza Hotel Map

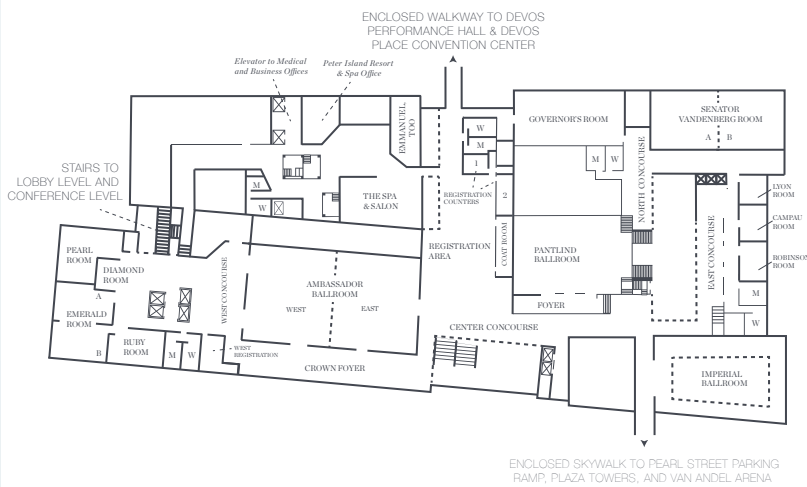
LOBBY LEVEL – 1ST FLOOR



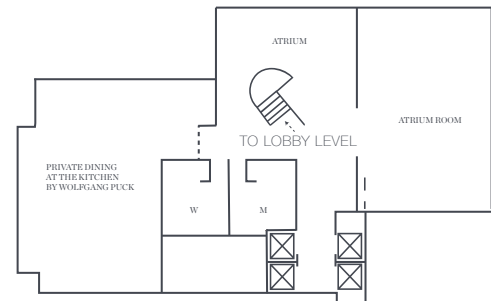
CONFERENCE LEVEL – 3RD FLOOR



CONCOURSE LEVEL – 2ND FLOOR



ATRIUM – LOWER LEVEL



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K-12 STEAM programs

- Water Quality Lab
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- Ecosystems
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Amplify Science

MSTA: Celebrate engineering in Amplify Science!

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Learn more about Amplify Science at one of our MSTA sessions.

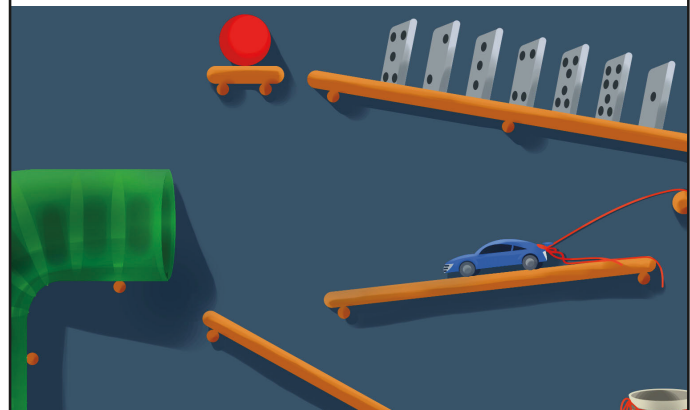
When: Friday, March 1	Where: Room Berkey
Time: 9-11 a.m.	Event: What's so phenomenal about phenomena? UC Berkeley Lawrence Hall of Science
1-2 p.m.	Think like an engineer with phenomenal science instruction!
2-3 p.m.	Unpack 3-dimensional standards with phenomenal science instruction
3-5 p.m.	Amplify Science: Wine and cheese reception

Hosted by your Amplify account executives:

Jackie Roper
jroper@amplify.com
(312) 202-2598

Matt Paupore
mpaupore@amplify.com
(734) 740-2169

authored by  THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY





Innovation starts here

Whether it's a biomedical breakthrough or an archaeological discovery, students and professors in Wayne State University's College of Liberal Arts and Sciences work side by side to change our understanding of the world. WSU gives undergraduates the chance to learn across disciplines, combining the personal experience of a small college with the global advantages of a major research university.

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