

SATURDAY & SUNDAY, APRIL 2 & 3

NATIONAL CONFERENCE
on **SCIENCE EDUCATION**

NASHVILLE

MARCH 31 – April 3, 2016

#NSTA16



VOL.3

NSTA National
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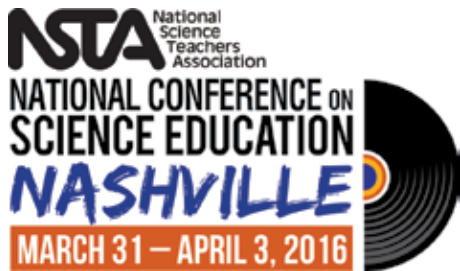
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NSTA 64th National Conference on Science Education

Science: Empowering Performance

Nashville, Tennessee • March 31–April 3, 2016

Volume 3 Saturday and Sunday, April 2–3

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National Science Teachers Association

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*People enjoy the Music City Walk of Fame Park in front of
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National Earth Science Teachers Association Events at 2016 Nashville NSTA Conference



All NESTA sessions are in *Music City Center, Davidson B*, unless otherwise indicated

Friday, April 1

- 9:30 – 10:30 am Earth System Science Share-a-Thon
- 11:00 am – noon NESTA and HHMI Share: Multimedia Tools and Resources for Teaching Earth Science
- 12:30 – 1:30 pm NESTA and TERC Share: EarthScope Chronicles: The Newberry Volcano
- 2:00 – 3:00 pm Geology Share-a-Thon
- 3:30 – 4:30 pm Rock, Mineral, and Fossil Raffle
- 6:30 – 8:00 pm NESTA Friends of Earth Science Reception, *Hilton Garden Inn, Skyline Junior Ballroom*

Saturday, April 2

- 9:30 – 10:30 am Astronomy Science Share-a-Thon
- 11:00 am – noon American Geophysical Union Lecture, Dr. Linda Kah, Kenneth Walker Professor at UT-Knoxville, *Music City Center, Grand Ballroom C2*
- 12:30 – 1:30 pm NESTA and CIESIN Share: Exploring a Compendium of Online Resources for Teaching Earth Science
- 2:00 – 3:00 pm Atmosphere and Ocean Share-a-Thon
- 3:30 – 4:30 pm Innovative Ways to Teach about Weather Observation and Weather Hazards
- 5:00 – 6:00 pm NESTA Annual Membership Meeting

NESTA gratefully acknowledges the following organizations as sponsors:





— Photo courtesy of Nashville Convention & Visitors Corp.

Mission Statement

The mission of NSTA is to promote excellence and innovation in science teaching and learning for all.

The ideas and opinions expressed in the conference sessions, and in any handout materials provided, are those of the presenter. They are not those of the National Science Teachers Association nor can any endorsement by NSTA be claimed.

Saturday, April 2

8:00–9:00 AM	The NGSS@NSTA Hub	18
8:30 AM–4:30 PM	Teacher Researcher Day	9
9:00 AM–3:00 PM	Exhibits	30
9:30–10:30 AM	Paul F-Brandwein Lecture: J. Drew Lanham	31
	<i>sponsored by Brandwein Institute</i>	
9:30–10:30 AM	NGSS Share-a-Thon	33
10:00 AM–4:00 PM	Meet Me in the Middle Day	11
11:00 AM–12 Noon	AGU Lecture: Linda C. Kah	45
2:00–3:00 PM	NSTA/ASE Honors Exchange Lecture: Corinne Stevenson . .	67
2:00–3:00 PM	Arthur C. Clarke Institute for Space Education Lecture:	68
	Jeff Goldstein	
	<i>sponsored by Arthur C. Clarke Institute for Space Education</i>	
2:00–4:00 PM	Science in the Community Forum on	75
	Family Science Learning	
3:30–4:30 PM	Featured Presentation: Peter McLaren	78
8:00–10:00 PM	Boot Scootin’ Boogie	91

The Nashville Conference Committee has planned the conference around these four strands, enabling you to focus on a specific area of interest or need. Strand events are identified by icons throughout the daily program.

See the following pages for a list of sessions and events for each strand.



Setting the Stage: Scientific Literacy

To reach the goal of a scientifically literate population, it is imperative to build an understanding of the nature of science, history of science, inquiry, and the practices of science and engineering. Students need opportunities to learn how scientists “know what they know” and what sound science looks like. In this strand, participants will develop understanding of the nature of science for all learners and explore how science and scientific tools have progressed over time.



Building the Band: Involving Community Stakeholders

To build authentic science experiences, it is necessary to reach outside a school’s walls to form strategic partnerships with informal science education (museums, community resources), Economic and Community Development (ECD), chambers of commerce, institutes of post-secondary education, after-school program providers, and national and local extracurricular groups (e.g., scouts, boys and girls clubs, and environmental education groups). Together, educators and stakeholder organizations can leverage opportunities for grants, outreach, and real-world collaboration for students. Participants in this strand will gain ideas for locating external resources and developing partnerships to strategically support instruction for real-life learning experiences.



Harmonizing Concepts: Integrating Instruction

High-quality instruction demands integration of STEM content with leading initiatives such as the Common Core State Standards, in English language arts and mathematics; CTE (Career and Technical Education); and subject areas, including social studies and the arts in trans-disciplinary approaches to teaching and learning. Authentic science learning requires concepts and skills from across multiple content areas. This strand will allow participants to explore how integrating targeted skills and concepts from other content areas can enhance science instruction and engage learners. Also emphasized will be the power of science to reinforce other content through authentic application tasks.



Stringing It All Together: Three-Dimensional Learning

The NRC *Framework* and the *Next Generation Science Standards* identified best practices from research for today’s learners. Good instruction must incorporate the NGSS three dimensions of crosscutting concepts, disciplinary core ideas, and science and engineering practices. Three-dimensional science learning produces scientifically literate and competent students. This strand will exemplify the intertwining nature of the three dimensions necessary for the highest quality science instruction. This strand will be tied together by accessing the latest research findings regarding science education.

Setting the Stage: Scientific Literacy

Saturday, April 2

8:00–8:30 AM

Connecting Interactive Science Notebooks and NGSS Practices: Early Childhood Students Engaging Their Community

8:30–9:00 AM

Little Learners, BIG Ideas: Innovative Thinking in Early Childhood

9:30–10:30 AM

Using the 2017 U.S. Total Solar Eclipse to Promote Educational Outreach

Students Answer Sustainable Energy Research Questions with Current Science and Engineering Data

11:00 AM–12 Noon

Your Kids Can, Too! Scientific Argumentation for All Students

12:30–1:30 PM

Write to Know Science

2:00–3:00 PM

Designing Animals to Survive Cold Temperatures

3:30–4:30 PM

From Cookbook to Open Inquiry: How to Develop the Necessary Skills

5:00–5:30 PM

Enhanced Exit Ticket: Round-Trip to Greater Student-Teacher Accountability

5:30–6:00 PM

Primary Literature: Students Reading Real Science

Sunday, April 3

8:30–9:00 AM

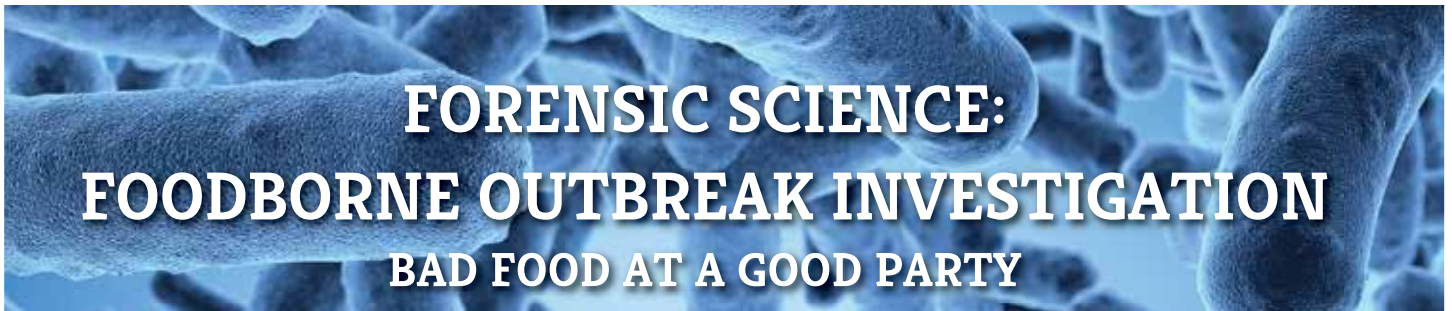
Using Expeditions as Contexts for Teaching Science: Adventure Mississippi River

9:30–10:00 AM

Science Fair: A Learning Progression Across K–5

10:00–10:30 AM

Using Web-Based Resources to Assist Diverse Learners to Learn Scientific Concepts While Engaging in Science Practices



A collage of news articles and scientific reports related to foodborne outbreaks. Visible headlines include: "About 300 Sickened With Campylobacter at NJ Boarding School", "CDC Final Update: 19 Infections Linked to Costco Rotisserie Chicken Salad", "Norovirus Hitting California Much Harder Than Last Year", "E. coli Outbreak Ever be Found?", "Possible Source of Fig & Olive Outbreak: Items Not Made Fresh", "Recalled Blend Celery and Onion Blend May Be Contaminated", "Several states are investigating an outbreak of Shiga toxin", and "Outbreak: Salmonella".

A relevant, inquiry based, hands-on lab for students to explore the phenomena of a real foodborne outbreak

Come to Booth 816 for more info



Building the Band: Involving Community Stakeholders

Saturday, April 2

8:00–9:00 AM

Students and Teachers Investigating Climate Change and Remote Sensing

8:40 AM–3:30 PM

Short Course: Is It Spring Yet? Field Studies with Middle School Citizen Scientists (By Ticket: SC-14)

9:30–10:30 AM

Science Ambassadors: Partnering Elementary and High Schools for STEM Night Events

11:00 AM–12 Noon

Making STEAM Rise in Your School

12:30–1:00 PM

Empowering Our Students to Be Citizen Scientists!

1:00–1:30 PM

Using Career Academies to Develop Community Partnerships in the Classroom

Sunday, April 3

9:30–10:00 AM

Planting the Seeds to Cultivate Meaningful Science Practices in Garden Classrooms

10:00–10:30 AM

Building a Learning Garden While Integrating Literacy and Science

Stringing It All Together: Three-Dimensional Learning

Saturday, April 2

8:00–9:00 AM

All Learners and the NGSS: The Importance of Three-Dimensional Learning and Reasoning

8:00–11:00 AM

Short Course: Building Better Lessons: NGSS Classroom Redesign (By Ticket: SC-11)

9:30–10:30 AM

Engineering Remotely Operated Vehicles Incorporates Three-Dimensional Learning to Improve Student Achievement

11:00 AM–12 Noon

Revamping Our Best Earthquake Lessons with Argument-Driven Inquiry to Better Target the NGSS

12:30–1:00 PM

Warm the Water to Save Your City: An Engineering and Educational Technology NGSS Student Assessment Task

1:00–1:30 PM

Explaining Population Dynamics Through the Modeling of Long-Term Data on Hurricane Disturbance in Puerto Rico

3:30–4:30 PM

Motivating Modeling with Anchoring Phenomena and Challenge Questions

Sunday, April 3

8:00–9:00 AM

Is Your Beak Stuck? How to Use the Three Dimensions of the NGSS in a Natural Selection Activity

9:30–10:30 AM

From Memorization to Modeling—Reconceptualizing Teaching About Cellular Division

11:00 AM–12 Noon

Orchestrating a Scientific Symphony with the Three Dimensions of the NGSS

Harmonizing Concepts: Integrating Instruction

Saturday, April 2

8:00–9:00 AM

Art and the Cosmic Connection

9:30–10:30 AM

NGSS and CCSS Mashup: Science Museum Transforms Teaching

11:00 AM–12 Noon

Come Fly with Us!

12:30–1:30 PM

Lead with Science: Learn How to Use Science Tasks to Reinforce *Common Core State Standards*, in English Language Arts and Mathematics

5:00–6:00 PM

A Cross-Curricular Contamination Case: Integrating Core Content Through Self-Paced Learning

Sunday, April 3

8:00–9:00 AM

Chapter Books at the Crossroads of the NGSS and CCSS

9:30–10:30 AM

Project-Based Learning: How It Has Changed Teaching and Learning in Our School

11:00 AM–12 Noon

Data Literacy for Science Teachers: Understanding and Integrating CCSS *Mathematics* Data Standards to Strengthen Your Science Curriculum



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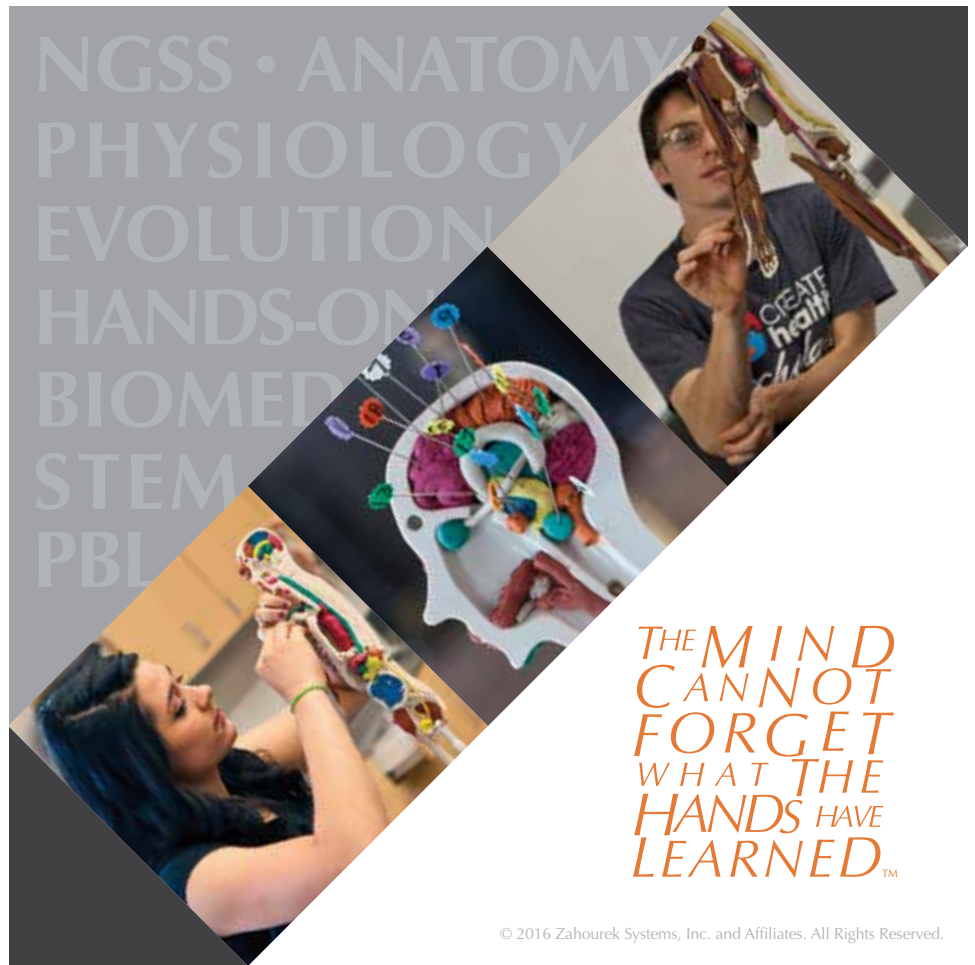
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Teacher Researcher Day

Saturday, April 2, 8:30 AM–4:30 PM

East Ballroom, Renaissance

Teacher researchers are curious about their students' learning and ask questions to try to better understand what is happening in their classrooms. They also share their findings with colleagues in their schools and elsewhere. Teacher Researcher Day is for both new and experienced teacher researchers. The full day of activities includes a poster session and presentations on topical issues. These sessions provide opportunities to meet teacher researchers and learn about their studies in a wide variety of contexts. An agenda follows. *Teacher Researcher Day events are described throughout this volume.*

8:30–9:30 AM	Poster Session for Teachers and Teacher Educators Inquiring into Science Learning and Teaching	12:30–1:00 PM	Concurrent Sessions
		1:00–1:30 PM	Concurrent Sessions
9:30–11:00 AM	Panel Discussion: <i>Integrating Instruction to Meet Student Needs</i>	2:00–2:30 PM	Concurrent Sessions
		2:30–3:00 PM	Concurrent Sessions
11:00 AM–12 Noon	Concurrent Sessions	3:00–3:30 PM	Informal Conversations About Teacher Research
12 Noon–12:30 PM	Leading from the Classroom: Science Inquiry Group Network	3:30–4:30 PM	Collaborative Leadership Planning

NSTA Press Sessions

NSTA Press® books offer new classroom ideas and standards-based strategies. Join NSTA Press authors for these sessions linked to the topics of their books.



Saturday, April 2

8:00–9:00 AM

Integrating Engineering Practices into a Whole-Class Inquiry Challenge

Picture-Perfect Science Lessons: Using Picture Books to Guide Inquiry, K–5

9:30–10:30 AM

Solar Astronomy Curriculum Resource that Meets the NGSS = Getting Ready for the All-American Eclipse

11:00 AM–12 Noon

Diving into the NGSS Disciplinary Core Ideas: How and Why They Are Important for Teaching and Learning

Bringing Outdoor Science In

Learn Strategies to Help You Implement the NGSS Practices!

2:00–3:00 PM

Five E(z), “Elementary” Steps To Next Generation Science Teaching

3:30–4:30 PM

Uncovering Student STEM-Connected Ideas in Science

Sunday, April 3

8:00–9:00 AM

CCSS ELA and Literacy + NGSS = Even More Brain-Powered Science

9:30–10:30 AM

What Are They Thinking? Investigating the Moon Through Formative Assessment Probes and Strategies That Link Concepts and Practices

11:00 AM–12 Noon

Forensics in Chemistry

The NGSS@NSTA Hub

Saturday, April 2, 8:00–9:00 AM
104A, Music City Center

This session will feature a tour of the NGSS@NSTA Hub, a digital destination to support teaching and learning of the NGSS. Hear about the work of 55 NGSS@NSTA curators—a group of educators from all across the U.S. working to identify resources that support the standards. See page 18 for details.

NGSS Share-a-Thon

Saturday, April 2, 9:30–10:30 AM
Grand Ballroom C1, Music City Center

At the NGSS Share-a-Thon, get even more tips and tools to implement three-dimensional standards from NSTA’s NGSS Curators, NGSS writers, and other education experts. Leave with plenty of handouts and ideas you can use in your classroom right away! See page 33 for details.



Meet Me in the Middle Day

Saturday, April 2, 10:00 AM–4:00 PM

Omni

Organized by the National Middle Level Science Teachers Association (NMLSTA)
and sponsored by Carolina Biological Supply, PASCO scientific, and Texas Instruments

Calling all middle school science teachers! Meet Me in the Middle Day is designed just for you. The day will include sessions geared toward middle school, and a share-a-thon with a room full of activities that you can take back to your

classroom. Join us and re-energize your teaching. You may even be the lucky winner of an iPad mini or other door prizes. *Meet Me in the Middle sessions are described throughout this volume.*

10:15–10:45 AM Concurrent Sessions
11:00–11:30 AM Concurrent Sessions
12:30–1:00 PM Concurrent Sessions

1:15–1:45 PM Concurrent Sessions
2:00–4:00 PM Middle Level Share-a-Thon

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Three Dimensions of the *Next Generation Science Standards (NGSS)*

Science and Engineering Practices	Crosscutting Concepts
<p>SEP1 Asking Questions and Defining Problems</p> <p>SEP2 Developing and Using Models</p> <p>SEP3 Planning and Carrying Out Investigations</p> <p>SEP4 Analyzing and Interpreting Data</p> <p>SEP5 Using Mathematics and Computational Thinking</p> <p>SEP6 Constructing Explanations and Designing Solutions</p> <p>SEP7 Engaging in Argument from Evidence</p> <p>SEP8 Obtaining, Evaluating, and Communicating Information</p>	<p>CCC1 Patterns</p> <p>CCC2 Cause and Effect: Mechanism and Explanation</p> <p>CCC3 Scale, Proportion, and Quantity</p> <p>CCC4 Systems and System Models</p> <p>CCC5 Energy and Matter: Flows, Cycles, and Conservation</p> <p>CCC6 Structure and Function</p> <p>CCC7 Stability and Change</p>

Disciplinary Core Ideas

Disciplinary Core Ideas in Physical Science	Disciplinary Core Ideas in Life Science	Disciplinary Core Ideas in Earth and Space Science	Disciplinary Core Ideas in Engineering, Technology, and the Application of Science
<p>PS1: Matter and Its Interactions PS1.A: Structure and Properties of Matter PS1.B: Chemical Reactions PS1.C: Nuclear Processes</p> <p>PS2: Motion and Stability: Forces and Interactions PS2.A: Forces and Motion PS2.B: Types of Interactions PS2.C: Stability and Instability in Physical Systems</p> <p>PS3: Energy PS3.A: Definitions of Energy PS3.B: Conservation of Energy and Energy Transfer PS3.C: Relationship Between Energy and Forces PS3.D: Energy in Chemical Processes and Everyday Life</p> <p>PS4: Waves and Their Applications in Technologies for Information Transfer PS4.A: Wave Properties PS4.B: Electromagnetic Radiation PS4.C: Information Technologies and Instrumentation</p>	<p>LS1: From Molecules to Organisms: Structures and Processes LS1.A: Structure and Function LS1.B: Growth and Development of Organisms LS1.C: Organization for Matter and Energy Flow in Organisms LS1.D: Information Processing</p> <p>LS2: Ecosystems: Interactions, Energy, and Dynamics LS2.A: Interdependent Relationships in Ecosystems LS2.B: Cycles of Matter and Energy Transfer in Ecosystems LS2.C: Ecosystem Dynamics, Functioning, and Resilience LS2.D: Social Interactions and Group Behavior</p> <p>LS3: Heredity: Inheritance and Variation of Traits LS3.A: Inheritance of Traits LS3.B: Variation of Traits</p> <p>LS4: Biological Evolution: Unity and Diversity LS4.A: Evidence of Common Ancestry and Diversity LS4.B: Natural Selection LS4.C: Adaptation LS4.D: Biodiversity and Humans</p>	<p>ESS1: Earth’s Place in the Universe ESS1.A: The Universe and Its Stars ESS1.B: Earth and the Solar System ESS1.C: The History of Planet Earth</p> <p>ESS2: Earth’s Systems ESS2.A: Earth Materials and Systems ESS2.B: Plate Tectonics and Large-Scale System Interactions ESS2.C: The Roles of Water in Earth’s Surface Processes ESS2.D: Weather and Climate ESS2.E: Biogeology</p> <p>ESS3: Earth and Human Activity ESS3.A: Natural Resources ESS3.B: Natural Hazards ESS3.C: Human Impacts on Earth Systems ESS3.D: Global Climate Change</p>	<p>ETS1: Engineering Design ETS1.A: Defining and Delimiting an Engineering Problem ETS1.B: Developing Possible Solutions ETS1.C: Optimizing the Design Solution</p> <p>ETS2: Links Among Engineering, Technology, Science, and Society ETS2.A: Interdependence of Science, Engineering, and Technology ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World</p>

SCIENCE RESOURCES FOR YOUNG CHILDREN



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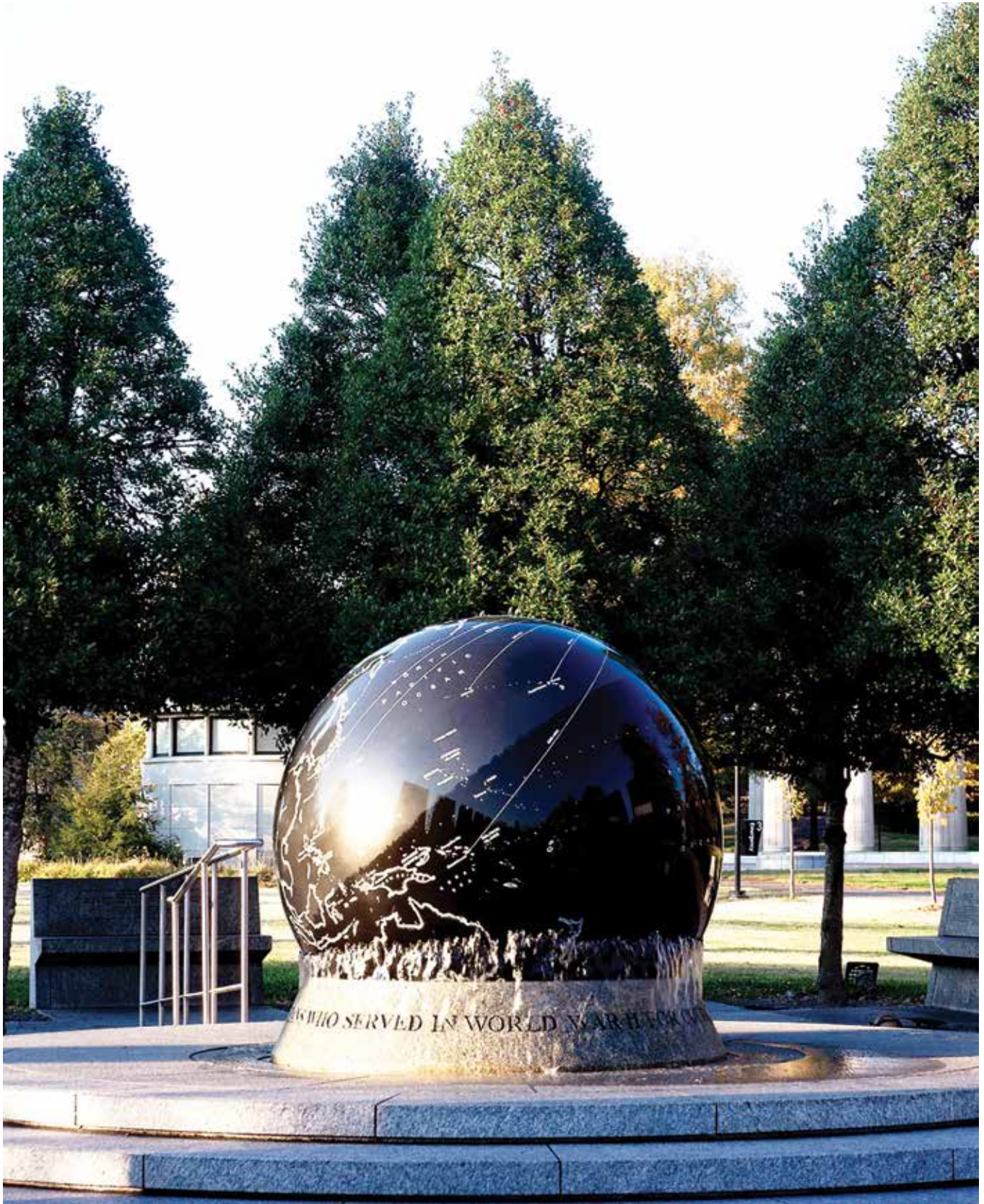
Starting With Science: Strategies for Introducing Young Children to Inquiry

Item #115
Price: \$19

Spotlight on Young Children: Exploring Science

Item #373
Price: \$20

Visit NAEYC.ORG/MEMBERSHIP and join today!



—Courtesy of Nashville Convention & Visitors Corp.

Built to honor Tennessee's 200th birthday and considered one of Nashville's top attractions, the Bicentennial Capitol Mall State Park is an outdoor museum of the state's history, which includes an 18,000 lb. rotating granite globe showing the places where Tennesseans fought during World War II.

7:00–9:00 AM Networking Opportunity

APAST Breakfast Meeting

(By Invitation Only)

Broadway K, Omni

Start your day with a great breakfast and catch up with old friends. This is an excellent opportunity to find out what's happening. Get more involved with APAST! For additional information, please visit www.apast.org.

7:30–8:15 AM Networking Opportunity

NSTA Past Presidents' Breakfast

(By Invitation Only)

Legends A, Omni

8:00–8:30 AM Presentations



Connecting Interactive Science Notebooks and NGSS Practices: Early Childhood Students Engaging Their Community

(Grades P–6)

101E, Music City Center

Science Focus: PS, SEP

Kyle Phelps (phelps.39@wright.edu), Enon Primary School, Dayton, Ohio

Michelle Fleming (michelle.fleming@wright.edu) and **Samantha Baker**, Wright State University, Dayton, Ohio

Join us as we showcase urban early childhood students' interactive science notebooks using the NGSS practices to engage their community in a schoolwide science fair.

The Vanderbilt Scientist-Teacher Collaborative Apprenticeship: Enhancing Science Teaching and Learning in Middle Schools

(Grades 5–8)

Davidson A2/3, Music City Center

Science Focus: GEN

Heather J. Johnson (heather.j.johnson@vanderbilt.edu), Vanderbilt University's Peabody College, Nashville, Tenn. Emphasis will be placed on the unique Vanderbilt scientist–teacher collaborative apprenticeship that leads to positive impacts on teacher, student, and fellow participants.

Making Informal Partnerships More Formal

(Grades K–12)

Acoustic, Omni

Science Focus: INF, NGSS

Thomas McKenna (@tjscience; tjmckenna01@gmail.com), Connecticut Science Center, Hartford

Successful implementation of the NGSS requires major support—informal science institutions can be that support in more ways than one.

Science Area

A science area category is associated with each session. These categories are abbreviated on the Science Focus line for each session listing. On page 119, you will find the conference sessions grouped according to their assigned science area category.

The science areas and their abbreviations are:

LS	=	Life Science
PS	=	Physical Science
ESS	=	Earth and Space Science
ETS	=	Engineering, Technology, and the Application of Science
GEN	=	General Science Education
INF	=	Informal Science Education

NGSS

See page 12 for a complete list of the NGSS codes used in this program.

Strands

The Nashville Conference Committee has planned the conference around the following four strands, enabling you to focus on a specific area of interest or need. Strand events are identified by icons throughout the daily program. For strand descriptions, see page 6.



Setting the Stage: Scientific Literacy



Building the Band: Involving Community Stakeholders



Harmonizing Concepts: Integrating Instruction



Stringing It All Together: Three-Dimensional Learning

The following icons will be used throughout this program.



NSTA Press® Sessions



Sessions highlighting STEM learning experiences that occur in out-of-school environments.

Dalton, Curie, Bohr, and More: A Chemistry Unit Outline

(Grades 6–12)

Broadway A, Omni

Science Focus: PS1

Marla Hines (marlarhines@gmail.com) and **Jennifer Brown** (@jbrownaps; brownjc@vestavia.k12.al.us), Vestavia Hills High School, Vestavia Hills, Ala.

Amy Murphy (@amykfmurphy; amykfmurphy@gmail.com), University of Montevallo, Ala.

We will share a chemistry unit organized by the major discoveries in the field of chemistry to help students see the big picture and make connections.



STEM Partnerships Among All Levels: Bringing It All Together

(General)

Broadway B, Omni

Science Focus: GEN, NGSS

Bonnie Maur (bmaur1@aol.com), Sacred Heart University, Fairfield, Conn.

Discussion centers on the implications of collaborating to create PD opportunities and provide examples of curriculum development in the STEM arena incorporating practices based on the NRC *Framework* and *CCSS*. Multi-leveled educators collaborated to create interdisciplinary STEM units.

Differentiated Instruction Through Technology-Based Menus

(Grades 3–12)

Broadway G, Omni

Science Focus: GEN

Michele Thompson (@mkttexas; mthompson2@kleinisd.net), Klein Instructional Center, Spring, Tex.

Let's show you the power of choice for students through menus with hands-on and technology options.

A Consilient Approach to Interdisciplinary History and Science

(Grades 7–12)

Broadway J, Omni

Science Focus: LS4, CCC

Nathan Mook (@nathanmook; nmook@chandler.school.org), Chandler School, Pasadena, Calif.

Open the door to new ways of understanding human history through genetics. Our project aims to create a more holistic, nuanced approach to studying past civilizations by utilizing new arenas of scientific investigation, such as genetics, forensics, heredity, and pedigrees.

Noticing Phenomena or Everyone Knows What a Zebra Looks Like

(Grades 4–10)

Cumberland 2, Omni

Science Focus: GEN, CCC1, CCC6, SEP1, SEP2, SEP3, SEP4

Richard Frazier (richard_frazier@hotmail.com), American Embassy School–New Delhi, India

We scrutinize the zebra test, consider showing patterns to students *vs.* helping them discover on their own, and explore activities about noticing and scientific inference.

Saturday, April 2

	Featured Speakers	Featured Speakers/Special Events	Featured Speakers/Special Events	Special Sessions/Events
8:00 AM		The NGSS@NSTA Hub 8:00–9:00 AM 104A, Music City Center		Teacher Researcher Day 8:30 AM–4:30 PM East Ballroom, Renaissance Nashville Meet Me in the Middle Day 10:00 AM–4:00 PM Broadway A–F Omni Nashville <i>Organized by the National Middle Level Science Teachers Association, and sponsored by Carolina Biological Supply, PASCO scientific, and Texas Instruments</i>
9:00 AM				
10:00 AM	Paul F. Brandwein Lecture 9:30–10:30 AM Grand Blrm. C2, Music City Center Speaker: J. Drew Lanham <i>sponsored by Brandwein Institute</i>	NGSS Share-a-Thon 9:30–10:30 AM Grand Blrm. C1, Music City Center		
11:00 AM	AGU Lecture 11:00 AM–12 Noon Grand Blrm. C2, Music City Center Speaker: Linda Kah			
12 Noon				
1:00 PM				
2:00 PM	NSTA/ASE Honors Lecture 2:00–3:00 PM 103B, Music City Center Speaker: Corinne Stevenson	Arthur C. Clarke Institute for Space Education Lecture 2:00–3:00 PM Grand Blrm. C2, Music City Center Speaker: Jeff Goldstein	Science in the Community Forum on Family Science Learning 2:00–4:00 PM 104A, Music City Center <i>Sponsored by Google Inc. ("GOOGLE")</i>	
3:00 PM				
4:00 PM	Featured NGSS Presentation 3:30–4:30 PM 101D, Music City Center Speaker: Peter McLaren			
5:00 PM				
6:00 PM				
7:00 PM				
8:00 PM				
9:00 PM		Boot Scootin' Boogie 8:00–10:00 PM Frontier Room <i>located above Whiskey Bent Saloon (open to all)</i>		
10:00 PM				

8:00–9:00 AM Presentations



NSTA Press® Session: Integrating Engineering Practices into a Whole-Class Inquiry Challenge

(Grades 9–12)

101D, Music City Center

Science Focus: ETS

Dennis Smithenry (smithenryd@elmhurst.edu), Elmhurst College, Elmhurst, Ill.

Michael Nocella (micnoc@d219.org), Niles West High School, Skokie, Ill.

Learn how an early-career chemistry teacher has integrated engineering practices into a “whole-class inquiry” challenge and hear what the experts have to say about it.



Students and Teachers Investigating Climate Change and Remote Sensing

(Grades 6–College)

103B, Music City Center

Science Focus: ESS, SEP4

David Bydlowski (@k12science; davidbydlowski@me.com), Science Consultant, Livonia, Mich.

Paul Henry (@k12science; henrya@resa.net), Wayne County Regional Educational Service Agency, Wayne, Mich. Student projects require teachers to provide the best instructional materials while students collect “real” data. This happens when students investigate climate change and remote sensing.

“Don’t simply retire from something; have something to retire to.” —Harry Emerson Fosdick

The NSTA Retired Advisory Board invites you to a vibrant and useful information-sharing session. Join your fellow colleagues and share your ideas about staying active both in and out of the profession.

Before and After Retirement—Practicalities and Possibilities

**Saturday, April 2
9:30–10:30 AM**

Omni Nashville Hotel, Music Row 3

For more information on the Retired Members Advisory Board, contact Linda Smith, chair, at elementary.science.teacher@gmail.com.



The NGSS@NSTA Hub

(Grades K–12) 104A, Music City Center

Science Focus: GEN, CCC1, CCC2

Ted Willard (@Ted_NSTA; twillard@nsta.org), Program Director, NGSS@NSTA, NSTA, Arlington, Va.

This session will feature a tour of the NGSS@NSTA Hub, a digital destination to support teaching and learning of the NGSS. Hear about the work of 55 NGSS@NSTA curators—a group of educators from all across the U.S. working to identify resources that support the standards.

Help! I Don't Know How to Grow Plants in My Classroom

(Grades P–8) 106A, Music City Center

Science Focus: LS, CCC1, CCC2, CCC6, SEP1, SEP3

Gennadyi Gurman (ggurman@queensbotanical.org), Urban Advantage at Queens Botanical Garden, Flushing, N.Y.

We'll dig into how to bridge the gap between the desire and the ability to grow plants in the classroom as well as address related pedagogical methodology.

Design Engineering with Young Learners Using Edible Lunar Vehicles

(Grades 2–8/College) Broadway H, Omni

Science Focus: ETS1, CCC

Kate Baird (@7350goldendreams; kbaird@iupuc.edu), Indiana University–Purdue University Columbus

Stephanie Coy (sscoy@iupuc.edu), Inglewood Elementary School, Nashville, Tenn.

Today, partnerships are often multinational. See how we build engineering design and crosscutting concepts into an edible lunar vehicle with worldwide school partners.

Teacher's Guide to Technical Writing for STEM: Proposals, Plans, and Reports

(Grades 6–12) Cumberland 1, Omni

Science Focus: GEN, NGSS

Angela McMurry (@AngelaMcMurry1; angela_mcmurry@darke.k12.oh.us) and **April Wulber** (@awulber; april_wulber@darke.k12.oh.us), Darke County ESC, Greenville, Ohio

Receive a copy of the guide developed for teachers by teachers that provides resources to assist in preparing students for the technical writing required for any type of STEM proposal or project.

INF After-School STEM Partnerships in Nashville

(Grades 1–12) Cumberland 3, Omni

Science Focus: INF

Melissa Ballard (@afterschool4all; @mellyball; mjballard@afterschoolalliance.org), Afterschool Alliance, Washington, D.C.

Tiffany Hodge (thodge@pencilfd.org), PENCIL Foundation, Nashville, Tenn.

Katherine Jezidja-Kendall (@katiekendall199; katiekendall15@gmail.com), John Early Museum Magnet Middle School, Nashville, Tenn.

Robyn Sellers (rsellers@adventuresci.org), Adventure Science Center, Nashville, Tenn.

Nashville boasts a unique partnership network for after-school learning. Find out how to think BIG when developing STEM learning experiences outside of the school day.

Dragon Genetics and Other Powerful Free Simulations for Biology Teaching

(Grades 6–College) Cumberland 4, Omni

Science Focus: LS1, LS3, CCC, SEP

Chad Dorsey (@chaddorsey; cdorsey@concord.org) and

Frieda Reichsman (@freichsman; freichsman@concord.org), The Concord Consortium, Concord, Mass.

Add some fire to your genetics teaching with Geniverse, a game-based unit on dragons, genetics, and DNA. This research-based genetics curriculum from The Concord Consortium has been demonstrated to deepen students' learning and engage them with all three dimensions of the NGSS. Receive free login and class account for Geniverse.

Using Young Adult Literature to Support Content Learning and Reading Comprehension in the Science Classroom

(Grades 4–12)

Cumberland 5, Omni

Science Focus: GEN, NGSS

Paula Greathouse and **Stephanie Wendt**, Tennessee Tech University, Cookeville

Transform your science classroom through the introduction of young adult literature—addressing national science standards and CCSS ELA in tandem.

Learning About Earth Across the Curriculum: Mapping Connections Between NGSS and Social Studies Across K–12

(Grades K–12)

Electric, Omni

Science Focus: ESS

Ann Rivet (@arivet6; rivet@tc.columbia.edu), Teachers College, Columbia University, New York, N.Y.

I'll present key opportunities and strategies identified from the NGSS for developing shared understanding of Earth and environment concepts between Earth science and geography.

Formative Assessments and the NGSS

(Grades 5–9)

Mockingbird 2, Omni

Science Focus: GEN, NGSS

Melissa Davis (melissa.davis@jefferson.kyschools.us), **Mallory Jensen** (mallory.jensen@jefferson.kyschools.us), and **Jacob Read** (jacob.read@jefferson.kyschools.us), Frederick Law Olmsted Academy South, Louisville, Ky.

Lacey Eckels (lacey.eckels@jefferson.kyschools.us), Jefferson County Public Schools, Louisville, Ky.

Are you struggling with NGSS implementation and formative assessment? Come see how our school transitioned to the NGSS using a schoolwide formative assessment system as our vehicle.

CCSS + NGSS = Science Fair

(Grades 4–12)

Mockingbird 4, Omni

Science Focus: GEN, SEP

Ronda Fields (rkfields@twc.com), Ballard High School, Louisville, Ky.

Ashley Fields, J.B. Atkinson Academy for Excellence in Teaching and Learning, Louisville, Ky.

Science Fair projects cover multiple disciplines. The project itself is the science, but English, social studies, math, and other disciplines also come into play. Receive an overview of the process from two teachers—one who has coached more than 20 Intel International Science and Engineering Fair® (ISEF) finalists and one who was a three-time ISEF finalist.

Student-Driven Research Projects in a High School Science Classroom

(Grades 9–12)

Music Row 1, Omni

Science Focus: GEN, NGSS

Sean Kerwin (@SeanKerwin1; skerwin@wacohi.net) and **Jennifer Miller** (@jenamiller4; jmiller@wacohi.net), Washington Community High School, Washington, Ill.

We will cover designing and implementing student-driven research in a high school classroom, including potential hurdles and the ability to link projects to the NGSS.

AMSE Session: Opportunities to Improve Equity in Your Classroom

(Grades 4–College)

Music Row 2, Omni

Science Focus: GEN, SEP

Deb Morrison (@educatordeb; educator.deb@gmail.com), TREE Educational Services, Boulder, Colo.

This session can help you gain confidence to improve the way you interact with students and it can open opportunities for all students to participate and succeed in the classroom.

INF ASTC Session: Beyond the Classroom Walls—Tapping into Informal Science Centers to Support Student-Driven Investigations

(Grades K–12)

Music Row 3, Omni

Science Focus: INF, SEP1, SEP3, SEP4

Eric Godoy (@marmto79; egodoy@dmns.org), Denver Museum of Nature & Science, Denver, Colo.

Patricia Kincaid (kincaidpatty@msn.com), Denver (Colo.) Public Schools

Acquire resources to support meaningful, authentic student investigations and hear research results from Urban Advantage Metro Denver's partnership between school districts and informal science organizations.

Deconstructing the Silos of Physical and Life Sciences in Grades 7–12 Classrooms

(Grades 5–College)

Fisk Two, Renaissance

Science Focus: LS, PS, CCC, SEP

Lisa Neesemann (@PeskyPlatypus; lisa.neesemann@gmail.com), **Jessica Riccio** (riccio@tc.edu), and **Peter Hillman** (pch2110@tc.columbia.edu), Teachers College, Columbia University, New York, N.Y.

We will illustrate disciplinary core ideas and model the use of NGSS sample tasks. Our unique approach melds life and physical sciences into a cohesive crosscutting curriculum per the NGSS.

CEEMS: Challenge-Based Learning Units Incorporating Engineering Design with Secondary Science and Math Content

(Grades 7–12)

Music City Ballroom, Renaissance

Science Focus: ETS1, SEP

David Vernot (dvernot@gmail.com), University of Cincinnati School of Engineering, Cincinnati, Ohio

Secondary teachers developed CBL engineering units through this NSF-funded program. See examples and get access to a searchable database of 100+ of these units.

Project-Based Learning: Curriculum Design and Integration Strategies That Address NGSS and CCSS

(Grades 4–12) West Ballroom, Renaissance

Science Focus: GEN, SEP

Alfred Hall II (alhall1@memphis.edu), The University of Memphis, Tenn.

Review components of PBL design and engage in the development of a PBL unit with integrated content and objectives to address the NGSS and CCSS.

8:00–9:00 AM Hands-On Workshops

STEMulate Student Learning by Infusing Engineering Design Using the 6 Es

(Grades 4–8) 101 A/B, Music City Center

Science Focus: ETS1, PS2

Anita Deck (anita.deck@gmail.com), Virginia Tech, Blacksburg

This 6E adds E-search to the 5E (Engage, Explore, Explain, Elaborate, and Evaluate) model. Join me for a hands-on, cross-curricular engineering design challenge activity with the 6E instructional model that inspires thinking, collaboration, creativity, and problem solving.



NSTA Press® Session: *Picture-Perfect Science Lessons: Using Picture Books to Guide Inquiry, K–5*

(Grades K–5) 101C, Music City Center

Science Focus: GEN, CCC1, CCC2

Emily Morgan (@EmilyMorganNTYS; emily@pictureperfectscience.com) and **Karen Ansberry** (karen@pictureperfectscience.com), Picture-Perfect Science, West Chester, Ohio

The authors of NSTA’s award-winning *Picture-Perfect Science* series will share lessons that integrate elementary science and the *Common Core State Standards for ELA*.

3D All Learners and the NGSS: The Importance of Three-Dimensional Learning and Reasoning

(Grades 3–7) 103A, Music City Center

Science Focus: LS

David Crowther, (crowther@unr.edu), University of Nevada, Reno

Explore three-dimensional learning with explicit language considerations and adaptations for ELL through a life science learning experience geared for grades 3–7. Participants will learn to modify existing lessons to accommodate three-dimensional learning aspects and language considerations for all learners.

Evaluate Your Sessions Online!

This year, we’re giving away a Apple iPad mini 2 Wi-Fi tablet to two lucky attendees who complete a session evaluation! Remember, the more sessions you attend and evaluate, the more chances you have to win! (See Volume 1, page 17 for details.)



Art and the Cosmic Connection

(Grades 4–10) 103C, Music City Center

Science Focus: ESS, CCC1, SEP1, SEP4, SEP6

Whitney Cobb (@STEM_McREL; wcobb@mcrel.org), McREL International, Denver, Colo.

Shari Asplund (shari.e.asplund@jpl.nasa.gov), NASA Jet Propulsion Laboratory, Pasadena, Calif.

Spectacular images arrive from NASA missions. What stories do they tell? The elements of art—shape, line, color, texture, and value—galvanize analysis and discourse. STEAM!

To the Moon and Back

(Grades 4–6) 104C, Music City Center

Science Focus: ESS1.B, ESS1.C, ESS2.A

Amanda Blough (@teacher4b; ablough@ccschambersburg.org) and **Amy Fetterhoff** (@FetterhoffAmy; teacher5a@corpus.pa.net), Corpus Christi School, Chambersburg, Pa.

Come learn how to apply NASA resources to your Earth and space science curriculum. Lessons include how moon rocks can be used to teach Earth’s geology by observing and recording data gathered from authentic moon rocks on loan from NASA Johnson Space Center. We’ll compare the geology of the moon to Earth’s geology and you’ll learn firsthand about the location of those moon rocks through hands-on activities. This session will also provide tech resources that students can use on any mobile device or personal computer. A comprehensive list of resources for all attendees. *Allergy Warning:* Candy that contains peanuts will be used.

Looking Up: Make Satellite Observations by Matching What a Satellite Sees!

(Grades K–8) 104E, Music City Center

Science Focus: ESS2.D, CCC1, SEP1, SEP3, SEP4, SEP8

Tina Harte, NASA Langley Research Center, Hampton, Va. Engage students in making cloud and weather observations for NASA. Through the use of classroom activities and games, your students will gain a better understanding of clouds and have fun at the same time!

Fantastic Physical Science for Young Learners!

(Grades P–1)

105A, Music City Center

Science Focus: PS2.A, SEP

Pamela Nolan-Beasley, Waitsburg (Wash.) School District
Explore fast-paced inquiry that’s sure to inspire our youngest scientists. Lively force and motion activities are NGSS focused and can be integrated with reading, writing, and language lessons.

INF Beyond the Fair: Carnivals, Olympiads, and STEAM Clubs, Oh My!

(Grades K–8)

105B, Music City Center

Science Focus: INF, SEP

Betsy Penn (pennb@leonschools.net), Deerlake Middle School, Tallahassee, Fla.

Lindsey Wohlrab (wohlrabl@leonschools.net), Roberts Elementary School, Tallahassee, Fla.

Check out how schools are integrating science carnivals, STEM clubs, and science olympiads into the curriculum in lieu of the classic science fair.

Space System for Middle School: How to Use an Orrery to Teach Earth-Sun-Moon Interactions

(Grades 6–8)

106C, Music City Center

Science Focus: ESS1.B, CCC4, SEP2

Walter Glogowski ([@wglogowski](mailto:wglogowski); wglogowski@gmail.com), 123STEM.com, Winnetka, Ill.

Learn how to construct an orrery as well as develop a narrative for your students so they can make deep connections to the Earth-Sun-Moon system interactions, including which cyclic patterns are responsible for lunar phases, eclipses, and the seasons. The first 50 participants will get a free orrery kit along with curriculum packet.

Math, Science, and ELA Team Up for an Oil Spill

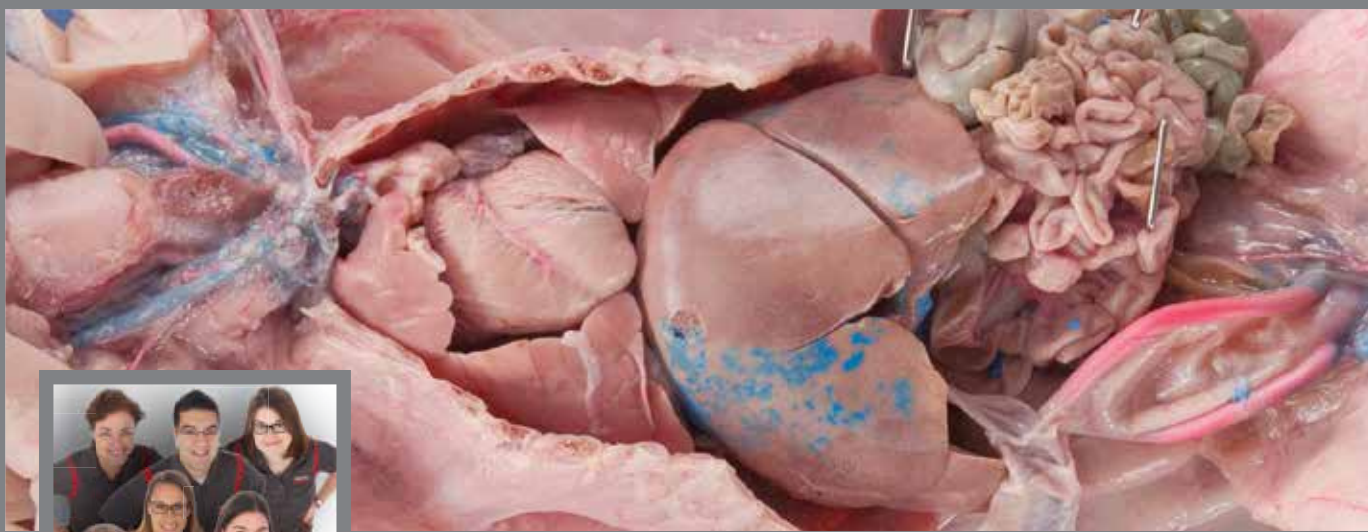
(Grades 5–8)

Broadway C, Omni

Science Focus: ESS3.C, SEP

Kimberly O’Dell (odellk@clintonschools.org) and **Dana Denton** (dentond@clintonschools.org), Clinton Elementary School, Clinton, Tenn.

Need a ready-made cross-curricular unit that is research based, relevant, and rigorous? This workshop is for you! One participant will win free materials.



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At the Core of STEM: A Tale of Integrated Lessons for Middle School Students

(Grades 6–8)

Broadway D, Omni

Science Focus: ESS, LS, PS, SEP2, SEP5, SEP6

Adaliz Gonzalez (@adalizg310; adaliz@rocketmail.com), New York City (N.Y.) Dept. of Education

Engage in two different integrated activities that meet CCSS ELA and the NGSS: forces, motion, and the solar system and ecosystems. Both activities emphasize the integration of math and science as well as engineering practices. Receive materials and handouts.

Why Can't I Be Michael Jordan? A Planning Tool for Designing Engaging NGSS-Focused Science Units

(Grades 7–12)

Legends B, Omni

Science Focus: GEN, NGSS

Nicole Lum (@ScienceFunFacts; nicole.peach.lum@gmail.com), Orr Academy High School, Chicago, Ill.

Alissa Berg (aberg@auslchicago.org), Academy for Urban School Leadership (AUSL), Chicago, Ill.

Explore a tried-and-true tool for planning NGSS units around engaging phenomena. Collaboratively plan your own unit and leave with resources for creating many more!

Creating a Real-World Experience for All Students in STEM

(Grades K–12)

Legends C, Omni

Science Focus: GEN, SEP

Jordan Menning (@JordanMenning; jmenning@nwaea.org), Northwest Area Education Agency, Sioux Center, Iowa

April Tidwell (@AprilTidwell; tidwela@live.siouxcityschools.com), Sioux City (Iowa) Community Schools

What makes a real-world STEM experience? Join us and experience a hands-on STEM challenge and receive resources supported by research and data.

BSCS Pathway Session: Taking the Lead with the NGSS

(Grades K–12)

Legends D, Omni

Science Focus: GEN, NGSS

Paul Numedahl, BSCS, Colorado Springs, Colo.

What does it take to lead K–12 teachers to understand and support three-dimensional learning in science? We will explore the opportunities and challenges of the NGSS for teacher leaders, district leaders, and professional developers. Not only will we cover ways to create a supportive environment for rich and critical conversations about teaching and learning, we'll unpack the significant changes necessary to bring the NGSS to life in the classroom.

The Lab-O-Matic: Meet Your Classroom's New Best Friend

(Grades 6–12)

Legends E, Omni

Science Focus: GEN, SEP1, SEP3, SEP4, SEP6, SEP7, SEP8

Eric Hall (@hallscience; eric.hall@dmschools.org) and

Maureen Griffin (@HHSProflearn; maureen.griffin@dmschools.org), Hoover High School, Des Moines, Iowa

Participants will sit, stay, and roll with the Lab-O-Matic. This tool helps organize students when evaluating and designing experiments. You will leave begging for more!

Crunching the Numbers: Novel Ways to Implement Graphing and Data Analysis into Your Curriculum

(Grades 6–College)

Legends F, Omni

Science Focus: GEN, SEP4, SEP5, SEP8

Melissa Fischer, Vanderbilt Center for Science Outreach, Nashville, Tenn.

Learn the basics of using graphing in your classroom and how to encourage students to analyze their data for any discipline you teach.

Science Explorations with Deaf and Hard-of-Hearing Students

(Grades K–12)

Legends G, Omni

Science Focus: ESS, ETS, LS, PS, CSS, SEP2, SEP8

Jake Noel-Storr, InsightSTEM, Inc., Tucson, Ariz.

Explore ways to engage deaf and hard-of-hearing students in science explorations, and engage all students by using American Sign Language.

Earthquake! Integrating CCSS and NGSS in the Elementary Science and Engineering Classroom

(Grades K–5)

Music Row 5, Omni

Science Focus: ESS3.B, ETS1, CCC, SEP

Rosita Young (rosita.young@ousd.k12.ca.us) and **Brenda**

Tuohy (brenda.tuohy@ousd.org), Oakland (Calif.) Unified School District

Engage in an engineering challenge that addresses a California problem while applying NGSS engineering design principles and addressing CCSS. All teaching materials provided. *Note:* Hands-on activities available to the first 30 participants.

Paul George’s Injury: The Impact of Whole-Class Modeling on Discussion*(Grades 5–12) Center Ballroom, Renaissance*

Science Focus: GEN, SEP2, SEP7, SEP8

Darrin Collins (*d.a.collins1831@gmail.com*), Wendell Phillips Academy High School, Chicago, Ill.

Explore the research-based approaches to engaging students in modeling in science. Develop an NGSS-focused curriculum that is relevant and content rich.

8:00–9:30 AM Meeting**Science Matters State Coordinators Meeting***(By Invitation Only)**Music Row 4, Omni***8:00–9:30 AM Exhibitor Workshops****AP Environmental: Using Your Stream to Teach STEM-Based Skills***(Grade 12) 107A, Music City Center*

Science Focus: ESS3.C, ETS1.A, EST1.B, LS2.A, SEP3, SEP4, SEP5, SEP8

Sponsor: LaMotte Co.

Tim Trumbauer, Chester River Association, Chestertown, Md.

Is the stream behind our school healthy? Don’t miss this informative workshop with an actual watershed manager that covers field techniques for collecting and analyzing samples, use of public data, common surface water pollutants, and ways to research potential pollution sources. Upon completion, you will be able to use the Water Quality Index to teach STEM-based skills and successfully implement a water quality component to your AP Environmental curriculum.

Albert Einstein Distinguished Educator Fellowship Program: Exciting Opportunities for K–12 STEM Educators to Influence Federal Programs and Policy in Washington, D.C.*(Grades K–12) 107B, Music City Center*

Science Focus: GEN

Sponsor: Albert Einstein Distinguished Educator Fellowship Program

Patti Obenour (*einsteinfellow@orise.orau.gov*), Albert Einstein Distinguished Educator Fellowship Program, Oak Ridge, Tenn.

Learn how Einstein Fellows are using their experience as K–12 STEM educators to influence federal STEM education legislation, programs, and policy in Congressional offices and the U.S. Department of Energy, NSF, and NASA. Find out what Fellows do and learn, what Fellowship benefits are offered, and how to apply.

Contextualizing Science Literacy with Agriculture*(Grades K–12) 108, Music City Center*

Science Focus: GEN

Sponsor: National Agriculture in the Classroom

Debra Spielmaker (*debra.spielmaker@usu.edu*), National Agriculture in the Classroom, Logan, Utah

Investigate how science literacy concepts can be easily understood within the context of agriculture. Explore how authentic examples in agriculture address the nature of science, demonstrate scientific advancements, and continue to engage research and engineering efforts to meet our current and future needs. Several free classroom-ready resources will be demonstrated.

Development of a Science Maker Kit for Inquiry-Based Teaching: Ideation and Feedback*(Grades 6–12) 110A, Music City Center*

Science Focus: GEN

Sponsor: Microsoft

Todd Beard (*v-tobear@microsoft.com*), Microsoft Innovative Educator Fellow, Detroit, Mich.

Participate in a set of Project-Based Learning activities to help inform the development of a tool kit for STE(A)M. BYOD for this hands-on session and share your current practices and unmet needs integrating tools into curriculum design. Your great ideas are instrumental into the creation of this tool kit.

Cereal City Science: Going Great Lengths Toward the NGSS

(Grades K–8)

110B, Music City Center

Science Focus: PS1.A, PS2

Sponsor: Battle Creek Area Mathematics and Science Center
Nancy Karre (nancy@bcamsc.org), Battle Creek Area Mathematics and Science Center, Battle Creek, Mich.

Explore NGSS-focused material for kindergarten through middle school that engages students in science concepts through phenomena and natural curiosity. The Battle Creek Area Mathematics and Science Center (BCAMSC) Cereal City Science program offers science units in which students are active learners through science and engineering.

Engagement Unlocked! Using Learning Games for STEM

(Grades K–12)

201B, Music City Center

Science Focus: INF

Sponsor: McGraw-Hill Education

Dan White, Filament Games, Madison, Wis.

STEM learning is important for equipping students with transferable 21st-century skills, but how do we make sure students are engaged with that content? In this workshop, Dan White, CEO of Filament Games, will discuss the ways that game-based learning shines when it comes to teaching STEM concepts.

Self-Propelled Vehicles! Constructing Engaging Engineering Experiences Using NGSS Performance Expectations

(Grades 6–8)

202B, Music City Center

Science Focus: ETS, CCC, SEP

Sponsor: Houghton Mifflin Harcourt

Michael DiSpezio, Author and STEM Specialist, North Falmouth, Mass.

Here's your chance to learn the basic teaching tenets of engineering as prescribed by grades 6–8 performance expectations. Learn and have fun as you participate in grade-appropriate activities that profile the NGSS approach to engineering and use inexpensive and easy-to-obtain materials. The final product: a mousetrap car!

Tracking Student Growth in Science Practices

(Grades 6–8)

202C, Music City Center

Science Focus: ESS, LS, PS

Sponsor: Inq-ITS

Janice Gobert (info@inqits.com), Rutgers, The State University of New Jersey, New Brunswick

Cameron Betts (info@inqits.com) and **Charity Staudenraus** (info@inqits.com), Inq-ITS, Worcester, Mass.

For the first time, Inq-ITS has made it possible to track student growth in science practices. We will work through the process of identifying independent and dependent variables applied to virtual labs in life, physical, and Earth science to help overcome student misconceptions. Focus will be on topics that cannot be assessed in an inquiry fashion in a hands-on lab. Bringing a device with internet access is highly encouraged.

Interactive Case Studies: Supplemental Software to Improve Critical Thinking in the Biology Classroom

(Grades 9–12)

205B, Music City Center

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Instead of reading a case study, experience one! Interactive case studies enable students to explore a variety of science careers, interact with the molecular world, and learn difficult biological concepts. Case studies have been proven by NSF and NIH research to improve learning and critical-thinking skills. Try one in this hands-on workshop!

Convection Currents and Plate Motion

(Grades 6–8)

205C, Music City Center

Science Focus: ESS2.B

Sponsor: LAB-AIDS®, Inc.

Mark Koker, LAB-AIDS, Inc., Ronkonkoma, N.Y.

Investigate and model convection currents using unique LAB-AIDS/SEPUP materials to develop an operational understanding of the between water temperature and its movement. The hands-on experience with convection in water coupled with the knowledge of Earth's interior is combined to explain the motion of Earth's tectonic plates and how that motion causes major geological events.

Forensic Science for High School, 3rd Edition

(Grades 9–12) 206 A/B, Music City Center

Science Focus: GEN

Sponsor: Kendall Hunt Publishing Co.

Barbara Ball (*barbarajuliene@yahoo.com*), Science Educator, Holt, Mich.

CSI and media influences have students interested in how science relates to the real world. The author will present from the new edition of *Forensic Science for High School*, an inquiry curriculum that uses labs and digital tools to help you effectively teach forensics through problem solving and analytical thinking.

Vampire Chronicles: Sink Your Teeth into Genetics and Blood Typing

(Grades 7–12) 207A, Music City Center

Science Focus: LS

Sponsor: Ward’s Science

Kelly Smith and **Michelle Pagani**, VWR Science Education, Rochester, N.Y.

The talk of Bedford is that there are vampires living amongst

the townspeople who prefer to feast on rare blood types. They, therefore, frequent large town gatherings. You, a vampire eradication committee member, will help investigate who may be at high risk of becoming a vampire’s next meal using Ward’s Simulated Blood. Explore techniques for extending learning beyond blood typing using animal blood microscope slides and simulated blood-testing techniques.

Zombie Apocalypse!

(Grades 6–12) 207B, Music City Center

Science Focus: LS

Sponsor: Texas Instruments

Jeffrey Lukens, Sioux Falls (S.Dak.) School District

Become part of a zombie apocalypse as brains will be served (while supplies last). Learn about disease-spread modeling using simulations and fun storylines about a zombie outbreak. Applicable for middle school and high school, this workshop is sure to scare you and your little zombies into learning how exciting Hollywood themes can be used to teach science concepts.

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Chemistry with Vernier

(Grades 9–College) 207C, Music City Center

Science Focus: PS, SEP

Sponsor: Vernier Software & Technology

Jack Randall (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.

Use Vernier sensors to conduct a variety of chemistry experiments from our popular lab books in this engaging hands-on workshop. Collect and analyze data using LabQuest 2 and Logger Pro computer software. Explore the wide range of tools from Vernier that promotes understanding of chemistry concepts.

Integrating Chromebook with Vernier Technology

(Grades 3–College) 207D, Music City Center

Science Focus: GEN, NGSS

Sponsor: Vernier Software & Technology

Verle Walters (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.

Learn how to use Chromebooks with Vernier technology in this workshop featuring experiments from Vernier lab books. See how engaging experiments like “Boyle’s Law” or “Grip Strength Comparison” teach students about data collection and analysis—practices that promote science inquiry and boost test scores.

Get That Grant Money!

(Grades 6–12) 208A, Music City Center

Science Focus: GEN

Sponsor: Bio-Rad Laboratories

Kirk Brown, San Joaquin County Office of Education, Stockton, Calif.

Successful grant writing isn’t rocket science, but it can take your teaching to new heights. Experienced grant writers will share some powerful tips for success to get you to the next level. Bring in any grant you wish to apply for and get your questions answered during this interactive workshop.

Circuits as Crayons: Crafting Interactive Circuits with Circuit Stickers

(Grades 2–8) 208B, Music City Center

Science Focus: PS

Sponsor: Chibitronics

Patricia Ng and **Alisha Panjwani** (alisha@chibitronics.com), Chibitronics, Lewes, Del.

This workshop will demonstrate how to introduce electronics through fun arts and craft activities. Participants will craft their own circuits on paper with Chibitronics Circuit Stickers, tiny peel-and-stick electronic parts that you can use to make interactive light projects. Join us and express yourself with electronics!

Engage with NGSS Using STEM Gauge™

(Grades 6–8) 209B, Music City Center

Science Focus: GEN, NGSS

Sponsor: Measured Progress

Susan Tierney and **Janet Dykstra**, Measured Progress, Dover, N.H.

Learn strategies for transitioning to NGSS and gathering evidence of three-dimensional learning using STEM Gauge formative assessment tools. This interactive workshop highlights a variety of classroom strategies to engage students with assessment questions, rubrics, and self-reflection templates. Participants will get a free Middle School STEM Gauge item set!

Implementing Three-Dimensional Learning

(Grades 6–12) 209C, Music City Center

Science Focus: GEN, NGSS

Sponsor: AquaPhoenix Education

Roxane Ohl (roh1@aquaphoenixsci.com), AquaPhoenix Scientific Inc., Hanover, Pa.

Looking for teaching strategies to develop scientifically competent students empowered with problem-solving skills? Come experience fingerprinting processes in the realm of the NGSS crosscutting concepts, disciplinary core ideas, and science and engineering practices. Partner with Kemtec to transition the focus from teaching and learning to understanding and applying.

Living By Chemistry: Pass the Proton—Acids and Bases

(Grades 9–12) 210, Music City Center

Science Focus: PS

Sponsor: Bedford, Freeman, & Worth High School Publishers

Jeffrey Dowling, Bedford, Freeman & Worth and W.H. Freeman & Co., New York, N.Y.

Teach rigorous chemistry with guided inquiry! Let’s explore activities that help students understand theories of acids and bases and other core chemistry concepts through the context of toxicity. Take home free sample lessons and materials from the *Living By Chemistry* (2nd ed.) curriculum.



—Courtesy of Jacob Slaton

Proteins Are the Cash of Biotech

(Grades 9–College)

212, Music City Center

Science Focus: LS

Sponsor: G-Biosciences

Ellyn Daugherty, Biotechnology Educator, Redwood City, Calif.

Proteins are usually colorless and always submicroscopic. How can scientists know they have an active protein and determine how much protein they have? Join Ellyn Daugherty, biotechnology educator/author, in this hands-on workshop to conduct three assays showing the presence and relative activity of two different types of amylase.

Discourse Tools for Equitable and Rigorous Talk

(Grades 5–8)

214, Music City Center

Science Focus: GEN, SEP

Sponsor: Activate Learning

Heather Milo (hmilo@activatelearning.com), Activate Learning, Greenwich, Conn.

The *Framework* promotes learning as a fundamentally social endeavor supported by collaborative and communicative norms. Yet, sustaining these norms requires all members to articulate, make sense of, and evaluate each other's ideas, making discourse tools vitally important. Walk away with ready-to-use tools that foster productive talk around big science ideas!

8:00–11:00 AM Short Courses

3D Building Better Lessons: NGSS Classroom Redesign (SC-11)

(Grades K–12) Tickets Required: \$28 Davidson, Sheraton

Science Focus: GEN, NGSS

Zoe Evans (@zoe_evans; zoevans@carrollcountyschools.com), Villa Rica High School, Villa Rica, Ga.

Chris Embry Mohr (chrismohr@olympia.org), Olympia High School, Stanford, Ill.

Jeremy Peacock (jeremy.peacock@negaresa.org), Northeast Georgia RESA, Winterville, Ga.

Julie Olson (julie.olson@k12.sd.us), Mitchell High School, Mitchell, S.Dak.

For description, see Volume 1, page 57.

Models: Key to Making Thinking Visible (SC-12)

(Grades 3–8) Tickets Required: \$31 Suite 5A, Sheraton

Science Focus: ETS1, PS1.A PS3.B, PS3.C, CCC1, CCC2, CCC4, CCC5, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Diana Velez (@dbvelez; dvelez@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley

Claudio Vargas (claudio.vargas@ousd.org), Oakland (Calif.) Unified School District

For description, see Volume 1, page 57.

8:15–9:15 AM Meeting

Past Presidents Advisory Board Meeting

Legends A, Omni

8:30–9:00 AM Presentations



Little Learners, BIG Ideas: Innovative Thinking in Early Childhood

(Grades P–3) *101E, Music City Center*
Science Focus: GEN

Allison Bemiss (@LittleInnovator; *allison.bemiss@wku.edu*), Western Kentucky University, Bowling Green
Childhood is a magical time full of curiosity and wonder. I'll share strategies to help little learners play, explore, and develop innovative thinking skills.

Influence of 1:1 Chromebooks on Student Learning and Associated Professional Development Strategies

(Grades 3–8) *Davidson A2/3, Music City Center*
Science Focus: GEN

Miles McGeehan (*miles.mcgeehan@gmail.com*), Bozeman (Mont.) Public Schools

Nicholas Lux (*nicholas.lux@montana.edu*), Montana State University, Bozeman

Join us as we highlight the impacts of 1:1 Chromebook devices in grades 3–8 that were compiled in a formal mixed-methods research evaluation. Discussion includes strengths of ongoing teacher professional development and collaboration strategies.

INF Smithsonian National Air and Space Museum Exhibits as Sources for STEM Investigations

(General) *Acoustic, Omni*
Science Focus: ESS, ETS, INF, CCC3, CCC4, CCC6, SEP2, SEP4, SEP6, SEP7, SEP8

Katie Nagy (*nagyks@si.edu*) and **Martin Kelsey** (@STEMin30; *kelsey@si.edu*), Smithsonian National Air and Space Museum, Washington, D.C.

Explore object-based learning and techniques for using museum field trips as opportunities for students to collect data that they'll use in the classroom.

Simple Use of Scientific Models in High School Chemistry and Physical Science

(Grades 7–12) *Broadway A, Omni*
Science Focus: PS1.A, CCC4, SEP2

Kelly Ramey (@kellyramey; *kramey@tntech.edu*), Tennessee Tech University, Cookeville

Chemistry knowledge is especially difficult for students based on the interplay between the submicroscopic (atoms and molecules) and the macroscopic (observable) views. I'll highlight simple activities to help students understand the use of models and visualize matter as they connect these views.

Integrated STEM Learning with the ASSIST Teaching Approach

(General) *Broadway B, Omni*
Science Focus: GEN

Mark McDermott (@CollegeofEdSTEM; *mark-a-mcdermott@uiowa.edu*), The University of Iowa, Iowa City

Laura Wood (@MP_LWood; *laura.wood@mtpcsd.org*), Mount Pleasant Middle School, Mount Pleasant, Iowa

Mason Kuhn, University of Northern Iowa, Cedar Falls
Darrin Ellsworth (@DarrinEllsworth; *ellsworthdarrin@gmail.com*), Xavier High School, Cedar Rapids, Iowa

Argument-based Strategies for STEM Infused Science Teaching (ASSIST) is a research-supported comprehensive approach to developing engaging STEM learning environments built on argument-based instruction.

Learning to Teach Science in an Online Environment

(Grades 5–College) *Broadway G, Omni*
Science Focus: GEN, SEP

Lori Fulton (*fultonl@hawaii.edu*) and **Jon Yoshioka** (*jonyoshi@hawaii.edu*), University of Hawaii at Manoa, Honolulu

Online classes can be challenging in the sciences. Join us as we explore possibilities and outcomes for a hybrid course focused on preparing science educators.

Coding Contagion: Teaching Computational Thinking and Scientific Modeling by Having Students Develop Simulations of an Outbreak

(Grades 6–12) *Broadway J, Omni*
Science Focus: LS2.A, LS2.C, CCC4, CCC7, SEP

Adam Colestock (*acolestock@fwparker.org*) and **Kara Schupp** (*kschupp@fwparker.org*), Francis W. Parker School, Chicago

Come hear how students programmed an epidemic simulation using StarLogo, conducted experiments and extended their models to incorporate additional factors influencing the spread of disease.

Teach Your Students to Consciously Replace Misconceptions with Sound Scientific Knowledge

(Grades 2–College) *Cumberland 2, Omni*
Science Focus: GEN

Duane Stilwell (*dstilwell57@yahoo.com*), Nyack (N.Y.) Public Schools

Charles Sincerbeaux (*sincerbeaux@ymail.com*), George Washington Elementary School, White Plains, N.Y.

Students are not blank slates. They may have very robust misconceptions that must be addressed if they are to replace these with robust scientific understanding.

Making Students Scientists

(General)

Fisk One, Renaissance

Science Focus: GEN, NGSS

Kathy Biernat, St. Mary's Visitation School, Franklin, Wis. Dislike hearing "When will we ever use this?" Leave with ways to integrate real-world citizen science projects into your classroom.

8:30–9:30 AM Presentation

Teacher Researcher Day Session: Poster Session

(General)

East Ballroom, Renaissance

Science Focus: GEN, NGSS

Deborah Roberts-Harris (drober02@unm.edu), The University of New Mexico, Albuquerque

Find out what questions teachers and teacher educators are asking and how they are exploring these in their own classrooms.

8:30–10:00 AM Meeting

Shell Breakfast Meeting

(By Invitation Only)

Ryman One, Renaissance

9:00 AM–3:00 PM Short Course



Is It Spring Yet? Field Studies with Middle School Citizen Scientists (SC-14)

(Grades K–12) Tickets Required; \$60 Suite 7A, Sheraton
Science Focus: INF, LS1, LS2, CCC1, CCC6, SEP1, SEP3

Candyce Johnson (cjohnson@bbg.org), Brooklyn Botanic Garden, Brooklyn, N.Y.

Judith Hutton (jhutton@nybg.org), The New York Botanical Garden, Bronx

Deborah Sarría (dsarria@schools.nyc.gov), Andries Hudde Junior High School, Brooklyn, N.Y.

For description, see Volume 1, page 58.

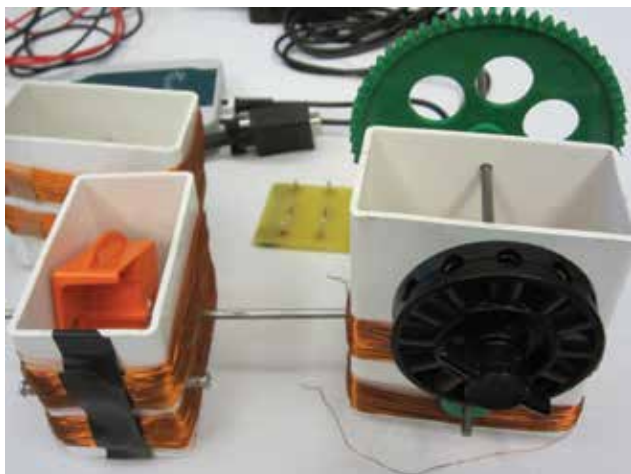
INF


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9:00–10:30 AM Exhibitor Workshop
Climate Changes Series I: Polar Popsicles—Life in the Ice

(Grades 6–12) 201A, Music City Center
Science Focus: ESS3

Sponsor: NOAA Ocean Service

Louise Huffman (louise.t.huffman@dartmouth.edu), Thayer School of Engineering at Dartmouth, Hanover, N.H.

What kind of life exists in glacial environments? How can new biological records from Antarctic ice cores inform our understanding of climate change? Polar scientist Christine Foreman will share the excitement of her latest research; proven hands-on activities will bring this home to your classroom.

9:00–11:00 AM Meeting
Teaming Up for STEM: Team Discussion and Planning Meeting

(By Invitation Only) Grand Ballroom A1, Music City Center

9:00 AM–3:00 PM Exhibits

Hall B, Music City Center

The NSTA Exhibit Hall is a must-see! NSTA brings you the leading science education companies and organizations to showcase products, services, curricula, and much more. You'll discover something new and exciting in the world of science teaching. Some exhibitors will offer materials for sale.

9:00 AM–5:00 PM Networking Opportunity
NSTA International Lounge

Mockingbird 1, Omni

Please stop by the NSTA International Lounge to relax or meet colleagues while you're at the conference. The lounge is open Thursday through Saturday, 9:00 AM–5:00 PM.

9:30–10:00 AM Presentations

Integrating Probes in the Interactive Notebook: The More You Put “IN” the More You Get “OUT!”

(Grades 7–12)

Acoustic, Omni

Science Focus: GEN

Jen MacColl (jmaccoll@susd.org), Chaparral High School, Scottsdale, Ariz.

The Interactive Notebook activates students' prior knowledge and uncovers their misconceptions. It allows students to demonstrate how much they learned, allows for infinite variation, and forces students to truly understand material, as opposed to simple memorization.

Who's Afraid of the Big Idea? Teaching About Ecosystems by Examining Wolves and Their Food Chains

(Grades 9–12)

Cumberland 4, Omni

Science Focus: LS2

Sanya Sidhu, Lakehead University, Thunder Bay, Ont., Canada

Big Ideas–based case studies to teach “sustainable ecosystems” using wolves in Yellowstone and Isle Royale National Parks? Yes, it works!

Teaching and Learning: Perspective on K–12 from Scientists

(Grades K–12)

Fisk One, Renaissance

Science Focus: GEN, NGSS

Margery Gardner (magard01@syr.edu) and **John Tillotson** (@johnwtillotson; jwtillot@syr.edu), Syracuse University, Syracuse, N.Y.

Gain insights from scientists on K–12 classroom teaching experiences. Through the lens of science education outsiders, we will share a study that provides refreshing insights on science teaching practices.

Primary Students and Teachers Practicing Authentic Engineering Practices: Look, Draw, Build, and Do It Again!

(Grades K–1/College)

Music City Ballroom, Renaissance

Science Focus: ETS1.A, ETS1.B, SEP

Alicia McDyre (@amcdyre; axd252@psu.edu), Pennsylvania State University, University Park

Jill Corkery (jcw19@scasd.org), State College (Pa.) Area School District

Jessica Jeffries (@jessjeffries12; jlc31@scasd.org), Gray's Woods Elementary School, Port Matilda, Pa.

Participants will have the opportunity to view students and teachers collaboratively working on solving authentic problems while employing NGSS engineering practices in two primary classrooms.

9:30–10:30 AM Paul F-Brandwein Lecture**Love: The Four-Letter Word That Science Forgot**

(General)

Grand Ballroom C2, Music City Center

Science Focus: ESS3, LS

Sponsored by Brandwein Institute



J. Drew Lanham (jos.drewlanham@gmail.com), Professor of Wildlife (non-game) Ecology/Management; School of Agricultural, Forest, and Environmental Sciences; Clemson University; Clemson, S.C.

Presider: Jack Padalino, President, Paul F-Brandwein Institute, Port Jervis, N.Y.

As a conservation/environmental scientist/educator who seeks the data and means to record and explain how birds, beasts, and habitats are impacted by human-caused and natural phenomena, the news of endangerment, extinction, and destruction come in a constant stream that can often serve to debilitate rather than motivate. How do we find hope in the hard science to save what's left? Caring is at the center of conservation but "love" is the word no peer reviewer will ever let pass. However, love and care are essential components of the environmental education process that demand revival. Heart is at the art of environmental education and action. We'll talk about how to regain that connection.

A South Carolina native, J. Drew Lanham holds an endowed chair as an Alumni Distinguished Professor at Clemson University and was named an Alumni Master Teacher in 2012. His research interests include songbird ecology and conservation; integration of game and nongame wildlife management; and the African American land ethic and its role in natural resources conservation.

In his teaching, research, and outreach roles, Drew seeks to translate conservation science to make it relevant to others in ways that are evocative and understandable. Drew strongly believes that conservation must be a blending of head and heart: rigorous science and evocative art. He is active on a number of conservation boards including the South Carolina Wildlife Federation, South Carolina Audubon, Aldo Leopold Foundation, BirdNote, and the American Birding Association. He is an inaugural fellow of the Audubon-Toyota TogetherGreen Initiative and is a member of the advisory board for the North American Association of Environmental Education.

A widely published author and poet, Drew's first solo book, The Home Place—Memoirs of a Colored Man's Love Affair with Nature, will be published in 2016.

9:30–10:30 AM Meeting**NSTA Committee, Advisory Board, and Panel Chairs Meeting**

(By Invitation Only)

Mockingbird 2, Omni

9:30–10:30 AM Presentations**Teaching Macromolecules Through the Lens of Nutrition**

(Grades 9–12)

101 A/B, Music City Center

Science Focus: GEN

Erin Be (ebe@bentleyschool.net) and **Kristina Pappas** (kpappas@bentleyschool.net), Bentley School, Upper School, Lafayette, Calif.

Serve up to new learning on macromolecules by engaging content related to food. Our unit plan addresses the content through the lens of nutrition while using inquiry and hands-on learning.

3D Engineering Remotely Operated Vehicles Incorporates Three-Dimensional Learning to Improve Student Achievement

(Grades 6–12)

103A, Music City Center

Science Focus: ETS

Kama Almasi (kama.almasi@lincoln.k12.or.us) and **Melissa Steinman** (melissa.steinman@lincoln.k12.or.us), Waldport High School, Waldport, Ore.

Katie Sard (katie.sard@lincoln.k12.or.us), Newport High School, Newport, Ore.

Kara Allan, Taft Elementary School, Lincoln City, Ore.

Sean Bedell (sean.bedell@lincoln.k12.or.us), Eddyville Charter School, Eddyville, Ore.

Hear how teachers in our school district used the same engineering project to incorporate the three dimensions of the NGSS and to improve student engagement and achievement.



Science Ambassadors: Partnering Elementary and High Schools for STEM Night Events

INF

(Grades 1–5/9–12)

103B, Music City Center

Science Focus: INF, SEP3

Donna Governor (dgovernor@windstream.net), NSTA Director, District V, and North Forsyth High School, Cumming, Ga.

Denise Webb (dewebb@forsyth.k12.ga.us), Coal Mountain Elementary School, Cumming, Ga.

Science Ambassadors are high school students who take science to local elementary schools. Find out how to begin and implement this program in your district.

■ ■ ■ NGSS and CCSS Mashup: Science Museum Transforms Teaching

(Grades K–6) 103C, Music City Center

Science Focus: GEN, NGSS

Deanna Wheeler (@sciwheeler; dwheeler@ccboe.com), J.C. Parks Elementary School, Indian Head, Md.

What happens to a school when they create a science museum. . . total teaching transformation! Experience how J. C. Parks Elementary changed from teaching to facilitating during a five-week inquiry-based environmental investigation. Starting from student questions, follow the journey of teachers and students as they move through the process of inquiry and student-led investigations while meeting the CCSS and NGSS.



Using the 2017 U.S. Total Solar Eclipse to Promote Educational Outreach

INF (General) 104A, Music City Center

Science Focus: ESS, INF

Charles Fulco (@totality2017; saros61@gmail.com), Professional Development Consultant, Otis, Mass.

Take advantage of a rare and spectacular celestial event to promote science literacy in your school and community while dispelling myths about eclipses through cross-content lessons.

Science Notebooks: Tools to Develop Scientific Practices and Student Learning

(Grades K–6) 104B, Music City Center

Science Focus: GEN, NGSS

Lori Fulton (fultonl@hawaii.edu), University of Hawaii at Manoa, Honolulu

When used insightfully, science notebooks help students develop scientific understandings. We will examine strategies that help teachers implement science notebooks in an insightful manner.

Argument-Driven Inquiry with Science Writing in the K–5 Classroom

(Grades K–5) 104D, Music City Center

Science Focus: GEN, SEP7

David E. Johnson (johnson.david@outlook.com), Perkiomen Valley School District, Collegeville, Pa.

Can argument-driven inquiry drive science writing in an elementary classroom? Emphasis will be placed on writing strategies focused on justifying claims with evidence and reasoning.

Building Claims, Evidence, Reasoning (CER) Skills Through a Pink Palace Museum and Shelby County Schools Collaboration

(Grades K–8) 105B, Music City Center

Science Focus: GEN

Alex Eilers (alex.eilers@memphistn.gov), The Pink Palace Museum, Memphis, Tenn.

Explore literacy-supported investigations with electromagnetism from Memphis' Pink Palace Museum that help urban students from Shelby County Schools develop claims, evidence, and reasoning skills.

Adopting, Adapting, and Applying the 5E Instructional Model to Enhance Science Experiences for Students with Special Needs

(Grades P–5) 106A, Music City Center

Science Focus: GEN, SEP3, SEP6, SEP8

Gregory Borman (gborman@schools.nyc.gov), New York City (N.Y.) Dept. of Education

Derek Ramdass (dramdas@schools.nyc.gov), P.S. K004, Brooklyn, N.Y.

Lionel Callender (lionel387@aol.com), P.S. Q993, Floral Park, N.Y.

Deborah Charles (dcharles2@schools.nyc.gov), P4K@P843K, Brooklyn, N.Y.

Special educators have modified the 5Es (Engage, Explore, Explain, Elaborate, and Evaluate) to provide effective science experiences for students with special needs through an interdisciplinary center-based learning approach.

Old Dog, New Tricks: Transitioning to Engineering and Design Challenges

(Grades K–8) Davidson A2/3, Music City Center

Science Focus: ETS, SEP6

Larry Plank (larry.plank@sdhc.k12.fl.us), **Shana Tirado** (shana.tirado@sdhc.k12.fl.us), and **Michele Wiehagen** (michele.wiehagen@sdhc.k12.fl.us), Hillsborough County Public Schools, Tampa, Fla.

Design competitions have been a part of science instruction for years, however, true engineering experiences require multiple iterations along with evolving constraints.



—Courtesy of Jacob Slaton

NGSS Share-a-Thon

(Grades K–12) *Grand Ballroom C1, Music City Center*

Science Focus: GEN, NGSS

Presenter: Ted Willard (twillard@nsta.org), Program Director, NGSS@NSTA, NSTA, Arlington, Va.

Would you like a chance to talk to colleagues about how they have implemented NGSS? At the NGSS@NSTA Share-a-Thon, get tips and tools to implement three-dimensional standards from NSTA's NGSS Curators, NGSS writers, and other education experts. Leave with plenty of handouts and ideas you can use in your classroom right away!

STEM Learning Ecosystems

(General) *Broadway A, Omni*

Science Focus: GEN

Gerald Solomon (@geraldsolomon; gsolomon@samueli.org), Co-Chair STEM Funders Network, and Samueli Foundation, Corona Del Mar, Calif.

Hear from the STEM Funders Network on the history—and findings—of their national STEM Ecosystem Initiative involving 27 cities around the country.

Enhancing and Integrating NGSS Strands Through Appropriate Uses of Technology

(Grades 7–12) *Broadway G, Omni*

Science Focus: GEN, NGSS

Marion Reeves (marion-reeves@comcast.net), Science Education Consultant, Decatur, Ga.

When both students and teachers use technology as a norm, creative application of the tools can enhance lessons as the three strands of NGSS are woven together.

Building Capacity for NGSS in Your District

(Grades 6–12) *Broadway H, Omni*

Science Focus: GEN, NGSS

David Helm (david.helm@fayette.kyschools.us), Fayette County Public Schools, Lexington, Ky.

Mary Elizabeth McKnight (mary.mcknight@fayette.kyschools.us), Tate's Creek Middle School, Lexington, Ky.

Listen to a group of teachers as they discuss how they are helping their science teachers grow in NGSS understanding.

I CAN Ask a Question! DID I Define a Problem?

(General) *Cumberland 2, Omni*

Science Focus: GEN, SEP

Holly Rosa (@BPSScienceHolly; hrosa@bostonpublicschools.org) and **Pamela Pelletier** (@BPSSciencePam; ppelletier@bostonpublicschools.org), Boston (Mass.) Public Schools

Join us as we introduce a new tool designed to make the science and engineering practices more student, teacher, and community friendly.

Differentiating Life Science NGSS for Lower-Level Students

(Grades 9–12)

Cumberland 3, Omni

Science Focus: LS

Justin Stroh (@StrohCity; jstroh1124@gmail.com), Barrington High School, Barrington, Ill.

Join me as I share experiences, learning targets, lessons, and activities related to modifying our co-taught lower-level biology classes based on the NGSS.

Using a Model of Shared Language to Build Science Literacy

(General)

Cumberland 5, Omni

Science Focus: GEN, NGSS

Kate Baird (@7350goldendreams; kabaird@iupuc.edu), Indiana University–Purdue University Columbus

Stephanie Coy (sscoy@iupuc.edu), Inglewood Elementary School, Nashville, Tenn.

Too often science is taught just as vocabulary. Join us as we share our language model that brings together personal understanding with scientific vocabulary through notebooks.

ICARUS

(Grades 3–College)

Electric, Omni

Science Focus: ESS1.B, ESS3.C, ETS1.A, ETS1.B, LS2.A, LS2.B, LS2.C, CCC1, CCC3, CCC4, CCC5, CCC6, CCC7

Ted Neal (ted-neal@uiowa.edu), The University of Iowa, Iowa City

Space—an obtainable frontier. Explore how to collect real data, including temperature, altitude, rates of ascent/descent, CO₂, O₂, and more. Join in for inquiry-based investigations for teachers.

Students Solving Real-World Problems

(Grades K–12)

Mockingbird 4, Omni

Science Focus: PS3.A, PS4, CCC5, SEP1, SEP3, SEP4, SEP8

Jessica Gaither (@ElemSciTchr; jfriesgaither@gmail.com),

L. Paige Gullett (gullettscience@gmail.com), and **Ann Marie McDonnell** (ammcdonnell@columbuschoolforgirls.org),

Columbus School for Girls, Columbus, Ohio

Learn how to plan an authentic schoolwide inquiry investigation solving a real-world problem. Easy-to-use handouts and examples included from our K–12 Dining Room Sound Study.

Engage with Engineering: Preparing a Science Department to Integrate Engineering Practices into Its Courses

(Grades 9–12)

Music Row 1, Omni

Science Focus: ETS, SEP

Amy Winston (amy_winston@newton.k12.ma.us), Newton North High School, Newton, Mass.

Baby steps, professional development, and fun! Hear one administrator's experience preparing a science department to infuse engineering into its science instruction.

STEM Teacher Liability: Walking on the Safer Side!

(Grades 1–12)

Music Row 2, Omni

Science Focus: ETS2, SEP

Kenneth Roy (@drroysafersci; royk@glastonburyus.org), Glastonbury (Conn.) Public Schools

Tyler Love (@UMES_Tech_Dept; tslove@umes.edu), University of Maryland Eastern Shore, Princess Anne

A STEM lab can be an unsafe place! Learn strategies to make activities and demos safer to reduce the risk of accidents and teacher liability.

Equity: Buzzword or Catalyst During a District Transition to the NGSS

(Grades K–12)

Music Row 5, Omni

Science Focus: GEN

Thomas Reinhardt (reinhardt.biology@gmail.com), Oakland (Calif.) Unified School District

Learn from Oakland, California, science specialists who maintain a focus on equity during districtwide curriculum development and professional learning. Participants will investigate strategies to apply to their NGSS transition.

What Do They Think? Engaging and Assessing Through the Use of Visual Media

(General)

Fisk Two, Renaissance

Science Focus: GEN

Vicki Massey (vickimassey@cox.net), Higley Unified School District #60, Gilbert, Ariz.

Grab your students' attention and find out what they are thinking by using cartoons, engaging visuals, and short videos. List of resources provided.

Promoting Scientific Reasoning Through Writing

(Grades 5–12)

West Ballroom, Renaissance

Science Focus: GEN

Missy Brooks (@wildmanbrooks; brooksm@mtnbrook.k12.al.us), Mountain Brook Schools, Birmingham, Ala.

Practical processes and protocols for implementing writing in the science classroom will be shared. Writing allows students to communicate deeper understanding and scientific reasoning.

9:30–10:30 AM Hands-On Workshops**NSTA Press® Session: Solar Astronomy Curriculum Resource That Meets the NGSS = Getting Ready for the All-American Eclipse***(Grades 5–9)**101C, Music City Center*

Science Focus: ESS, CCC1, CCC2

Dennis Schatz (*schatz@pacsci.org*), NSTA Director, Informal Science, and Pacific Science Center, Seattle, Wash.

A new solar astronomy curriculum resource from NSTA Press is NGSS focused and prepares teachers/students for the 2017 total eclipse of the Sun. Come explore these learning experiences.

**Students Answer Sustainable Energy Research Questions with Current Science and Engineering Data***(Grades 8–College)**101E, Music City Center*

Science Focus: ESS3.A, ESS3.C, ESS3.D, ETS2, LS1.C, LS2.B, LS4.B, CCC1, CCC2, CCC3, CCC5, SEP4, SEP7

Leith Nye (*@GLBioenergy; leith.nye@wisc.edu*), University of Wisconsin–Madison**John Greenler**, Great Lakes and Bioenergy Research Center, Madison, Wis.

Through research stories, data nuggets, and investigations, students learn how to apply science and engineering practices in the current quest for sustainable bioenergy and biofuels.

Meaningful Integration Between STEM Subjects in the Elementary Classroom*(Grades 1–5)**104C, Music City Center*

Science Focus: ETS2, SEP

Kathryn Hutchinson (*@eie_org; khutchinson@mos.org*), Museum of Science, Boston, Mass.

Let's consider attributes of integration that transform lessons from simply "checking off the STEM boxes" to truly meaningful learning experiences for elementary students.

Bringing Engineering, Technology, and Applications of Science into the Elementary and Middle School Classroom*(Grades 1–9)**104E, Music City Center*

Science Focus: ETS1, ETS2.B, PS2.A, PS2.B, PS3.C, CCC2, CCC4, CCC5, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8

Donald Powers (*DT-Powers@wiu.edu*), Western Illinois University, Macomb

Emphasis will be placed on activities that integrate engineering and technology activities appropriate for elementary and middle school classrooms. NGSS connections will be included.

Black Holes Suck!*(Grades 7–College)**105A, Music City Center*

Science Focus: ESS1, PS2

Jeffery Adkins (*@astronomyteacher; astronomyteacher@mac.com*), Deer Valley High School, Antioch, Calif.

Get the basics of how black holes work, including a hands-on activity to build a model of a black hole. In an act of cosmic revenge, the black hole does not eat you—you eat the black hole! Learn how to divide by zero and get away with it, the meaning of the scientific term "spaghettification," and more.

Using Lab Notebooks in the Preschool and Elementary Classroom*(Grades P–5)**106B, Music City Center*

Science Focus: GEN, SEP

Katie Morrison (*@ucds_seattle; katiem@ucds.org*) and **Deb Chickadel** (*@ucds_seattle; debc@ucds.org*), University Child Development School, Seattle, Wash.

Come learn how to teach data collection, analysis, and recording to young children. Take away tools to design and implement lab notebooks in your classroom.

Using a Web-Based Graphing Tool to Analyze and Interpret Local and National Weather and Climate Data for Patterns and Change*(Grades 6–8)**106C, Music City Center*

Science Focus: ESS2.D, ESS3.C, ESS3.D, CCC1, CCC2, CCC3, CCC4, SEP3, SEP4, SEP5, SEP6, SEP7

Matthew Mirabello (*mmirabello@amnh.org*) and **Jay Holmes** (*jholmes@amnh.org*), American Museum of Natural History, New York, N.Y.

Explore weather and climate data through an online graphing tool that simplifies data visualization so students can focus on analysis and interpretation. Nashville data available!

National Earth Science Teachers Association (NESTA) Shares: Astronomy Share-a-Thon*(General)**Davidson B, Music City Center*

Science Focus: ESS

Michael Passow (*michael@earth2class.org*), Dwight Morrow High School, Englewood, N.J.**Carla McAuliffe** (*carla_mcauliffe@terc.edu*), TERC, Cambridge, Mass.

Join more than 20 NESTA members and other education specialists as they share their favorite classroom activities. Lots of free handouts!



Games in Science! How to Use Them Effectively!

(Grades 3–10)

Legends B, Omni

Science Focus: ETS1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8

Judith Lucas-Odom, Chester High School, Chester, Pa.

Using the engineering design process, students will develop usable games to connect the CCSS and NGSS.

INF Engage Families with Your STEM Teaching

(Grades K–12)

Legends C, Omni

Science Focus: INF, SEP

Jake Noel-Storr (@noelstoj; drjakens@gmail.com), Insight-STEM, Inc., Tucson, Ariz.

Learn how to engage whole families in science by inviting them within your walls and helping them create their own learning opportunities beyond school!

BSCS Pathway Session: Using the BSCS 5E Instructional Model to Promote Three-Dimensional Learning

(Grades 3–12)

Legends D, Omni

Science Focus: GEN, NGSS

Paul Numedahl, BSCS, Colorado Springs, Colo.

This interactive session will deepen participant understanding of the BSCS 5E instructional model (Engage, Explore, Explain, Elaborate, and Evaluate) and how this model can be used to promote and support science learning for all students.

Building Partnerships: Schools, Museums, Nature, Along with Science Centers, Scientists, and MITS

(Grades 3–12)

Legends E, Omni

Science Focus: GEN, NGSS

Sandra Ryack-Bell (sryackbell@mits.org), MITS, Inc. (Museum Institute for Teaching Science), Quincy, Mass.

Robert Rocha (@rockybob65; rrocha@whalingmuseum.org), New Bedford Whaling Museum, New Bedford, Mass.

Rachel Stronach (rstronach@lloydcenter.org), Lloyd Center for the Environment, Dartmouth, Mass.

Ronald St. Amand (rstamand@charter.net), Springfield (Mass.) Public Schools

Join teachers participating in collaborative programs with MITS' partner organizations to explore inquiry investigations using NGSS science and engineering design practices and learn how to develop partnerships.

INF Family Science Night: Involving Community Stakeholders

(Grades 6–College)

Legends F, Omni

Science Focus: INF, NGSS

Elana Jacobs, Illinois Institute of Technology, Chicago

Family science nights are creative ways to involve all community stakeholders in the science learning process. Lesson plans and activities provided.

Analyzing and Interpreting Data: A 3-D Look at the Practice

(Grades K–12)

Legends G, Omni

Science Focus: GEN, NGSS

Walter Woolbaugh (walter@montana.com), Manhattan (Mont.) School District #3

The practice of analyzing and interpreting data will be explored through a three-dimensional lens in this interactive workshop focused on teachers' conceptual understanding.

Augmented Science

(Grades 3–College)

Center Ballroom, Renaissance

Science Focus: ETS2, CCC2, CCC3, SEP2, SEP3, SEP4, SEP5, SEP6, SEP7, SEP8

Matthew Cushing (mpc3@rice.edu), Rice University, Houston, Tex.

Find out how to use augmented reality in your science classroom to engage all learners and create an active learning environment. Explore multiple augmented reality apps and learn how to create your own augmented reality triggers using Aurasma.

9:30–11:00 AM Presentation

Teacher Researcher Day Session: Integrating Instruction to Meet Student Needs

(General) *East Ballroom, Renaissance*
Science Focus: GEN, NGSS

Deborah Roberts-Harris (drober02@unm.edu) and **Kathryn Watkins** (watkins@unm.edu), The University of New Mexico, Albuquerque

Discussion centers on the benefits and challenges of providing equitable integrated science education from multiple perspectives. Come with an open mind, and possible questions for the panel.

9:30–11:00 AM Hands-On Workshop

NSTA Aerospace Share-a-Thon

(General) *Davidson C, Music City Center*
Science Focus: ESS
Coordinated by members of the NSTA Aerospace Programs Advisory Board

Dave Garner (dgarner@usit.net), The University of Tennessee, Knoxville

From airplanes to asteroids—join teachers and representatives from industry and organizations to discover innovative ways to connect students to STEM through aerospace! Drawing for two one-year NSTA memberships (must be present to win).

CALLING ALL MIDDLE SCHOOL EDUCATORS

SATURDAY, APRIL 2, 2016 | 10:00 AM–4:00 PM | OMNI NASHVILLE

Must be registered for the conference to attend

Join us for a special **“Meet Me in the Middle Day,”** designed just for middle school educators, at **NSTA’s 2016 National Conference in Nashville!**

The day’s events will include a networking session, more than a dozen presentations specifically for middle school educators, and an afternoon share-a-thon featuring more than 100 presenters. You’ll walk away with ideas you can put to use in your classroom next week!

Organized by the
National Middle Level Science Teachers Association (NMLSTA)

Attend for a chance to win an iPad mini and other door prizes!



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9:30–11:30 AM Presentation

AMSE Session: George W. Carver Conversations Series on Diversity and Equity

(Grades K–12)

Broadway J, Omni

Science Focus: ETS, LS, SEP1, SEP3

Cherry Brewton (cbrewton@georgiasouthern.edu), Science Education Consultant, Statesboro, Ga.

Join George Washington Carver as “he” steps up to the podium to expound on his life story in the context of science and equity. Conversation follows and NGSS lesson ideas will be shared!

10:00–10:30 AM Presentations

Easy Ways to Modify Existing Lessons to Deepen Student Understanding

(Grades 7–12)

Acoustic, Omni

Science Focus: GEN, NGSS

Robbie Higdon (rhigdon72@yahoo.com), James Madison University, Harrisonburg, Va.

Stephanie Green (sgreen@anderson2.k12.sc.us), Belton-Honea Path High School, Honea Path, S.C.

Observe several approaches we have used to transform favorite labs, lessons, and instructional activities to support the guiding principles of the CCSS and NGSS.

Professional Learning Communities for Science Leaders

(General)

Fisk One, Renaissance

Science Focus: GEN

Holly Sullivan (@lex1science; hsullivan@lexington1.net), Lexington County School District One, Lexington, S.C.

Elizabeth Boland (eboland@lexrich5.org), Lexington Richland School District Five, Irmo, S.C.

Find out how a professional learning community can help science leaders help each other support science instruction.

Weight and See

(General)

Music City Ballroom, Renaissance

Science Focus: GEN, NGSS

Grace Glanton, The University of Mississippi, University, Miss.

Discover an innovative lesson that incorporates the three dimensions of the NGSS, even for our youngest learners.

10:00–11:30 AM Exhibitor Workshops

Modeling Earth, Sun, and Other Stars with Bring Science Alive!

(Grades K–8)

107A, Music City Center

Science Focus: ESS

Sponsor: Teachers Curriculum Institute

Presenter to be announced

Experience learning from a student’s perspective as you learn about the relationship between Earth, Sun, and other stars using a powerful online learning system. The lesson was entirely built on the NGSS.

The Expanding Universe

(Grade 9)

107B, Music City Center

Science Focus: ESS

Sponsor: Perimeter Institute for Theoretical Physics

Kevin Donkers and **Stephanie Keating**, Perimeter Institute for Theoretical Physics, Waterloo, Ont., Canada
Use simple hands-on activities to help students better understand the expansion of our universe.

Stretch Your Legs for Science!

(Grades K–12)

108, Music City Center

Science Focus: ESS3, LS2, LS3, LS4, CCC1, CCC6

Sponsor: Celestron

Jennifer Fee (birdsleuth@cornell.edu), The Cornell Lab of Ornithology, Ithaca, N.Y.

Join us for some pre-lunch exercise—explore Nashville via a bird walk! After a tutorial on bird identification, we’ll head outside with Celestron binoculars to experience firsthand how you can meet standards and engage students through bird-watching! After the walk, Celestron will raffle binoculars to a few lucky attendees.

Understanding the Community Impact of Environmental Hazards: Developing a Project-Based Learning Challenge from Start to Finish Using Microsoft Tools

(Grades 7–12)

110A, Music City Center

Science Focus: ESS

Sponsor: Microsoft

Helen Gooch (v-hegooc@microsoft.com), Microsoft Innovative Educator Fellow, Clarksville, Tenn.

Come learn about a project-based lesson that can create student understanding of environmental science and challenge students to take action to make a difference in their community. Through research and analysis, students create and present a proposal for a solution to the environmental hazard impacting their community.

McDowell Farm School: Integrating Best Practices in a Scientific Garden

(Grades 2–College)

110B, Music City Center

Science Focus: INF

Sponsor: McDowell Farm School

Maggie Johnston (maggie@campmcdowell.com), McDowell Educational Programs, Nauvoo, Ala.

Ali Papp (ali@campmcdowell.com), McDowell Farm School, Nauvoo, Ala.

Connect students to Earth, the food they eat, and their ability to impact the future of agriculture through STEM-based investigations in the garden. Activities focus on creating interdisciplinary garden programs where students can get outside, practice scientific inquiry and design, and explore sustainable systems for the future.

The Truth Behind Brain-Based Learning

(Grades 6–College)

201B, Music City Center

Science Focus: GEN

Sponsor: Society for Neuroscience

Alissa Ortman, Society for Neuroscience, Washington, D.C.

Janet Zadina, Tulane University School of Medicine, New Orleans, La.

There are numerous myths about the brain, and many of them relate to education and how the brain learns. In this workshop, challenge your beliefs and discover the truth behind some of the most commonly held brain-based learning myths.

3-2-1 Blast Off!

(Grades 2–8)

202A, Music City Center

Science Focus: PS2, PS3, CCC2, CCC5, CCC7, SEP1, SEP3, SEP4

Sponsor: Educational Innovations, Inc.

Tami O'Connor, Educational Innovations, Inc., Bethel, Conn.

Join us for a workshop brimming with things that go Bump! (and Zoom! and Boing!) We'll dazzle you with dynamic demos to help you teach Newton's laws. Explore energy with hands-on materials that can ignite your students' curiosity and spark their desire to learn more. Giveaways and door prizes!

Earth and Space Sciences for NGSS: A New Program (Grades 9–12)

(Grades 9–12)

202B, Music City Center

Science Focus: ESS

Sponsor: BIOZONE International Ltd.

Richard Allan (richard@biozone.co.nz), BIOZONE International Ltd., Hamilton, New Zealand

Find the tools you need to successfully implement the high school Earth and space science component of the NGSS program with BIOZONE's newest student workbook. This carefully constructed resource is strongly focused on student inquiry and written from first principles to address all aspects of the NGSS system architecture. Attendees receive a free sample packet that supports the NGSS.

No Great Science Student (NGSS) Left Behind with NexGen Inquiry™

(General)

202C, Music City Center

Science Focus: GEN, NGSS

Sponsor: Van Andel Education Institute Science Academy

Jim Nicolette (nexgeninquiry@vai.org) and **William Dinkelman**, Van Andel Education Institute Science Academy, Grand Rapids, Mich.

Learn how NexGen Inquiry's affordable, intuitive, and powerful software supports your curriculum and three-dimensional learning called for in the NGSS. Built by teachers for teachers, our web-based platform supports implementation of a research-based instructional model. Drawings for free subscriptions included. Bring your device, create your account, and get started.

Implementing 3D Printing Across the K–12 Curriculum

(Grades K–12)

204, Music City Center

Science Focus: GEN, SEP

Sponsor: Stratasys

Ryan Erickson, District 196, Eagan, Minn.

3D printing is all the rage. Come see how one district's K–12 approach to 3D printing is leading to greater student engagement, success, and college/career readiness. By implementing a scaffolded plan using 3D printer hardware and software, your students can experience—hands on—the excitement that comes with this technology.

Waves

(Grades 6–8)

205C, Music City Center

Science Focus: PS4.B

Sponsor: LAB-AIDS®, Inc.

Mark Koker, LAB-AIDS, Inc., Ronkonkoma, N.Y.

Although we live an EM waves-enabled lifestyle, most of us have no idea how they work. Join LAB-AIDS for a new middle level NGSS-based waves activity from SEPUP's *Issues and Physical Science* program. Explore light properties by investigating colors of the visible spectrum and their energy levels using phosphorescent material. Activities exemplify the NGSS and show how SEPUP embeds the research-based practices and real issues to deliver powerful content learning.

Collisions™: Reconceptualizing Chemistry Through Gameplay

(Grades 9–12)

206 A/B, Music City Center

Science Focus: PS

Sponsor: PlayMada Games

Jude Julien, Bronx High School for Writing and Communication Arts, Bronx, N.Y.

Joseph Vincente, East Side Community High School, New York, N.Y.

Edward Wang (edwardw@playmadagames.com), PlayMada Games, New York, N.Y.

Experience a new digital game designed to teach fundamental chemistry ideas in a fun, exploratory, and engaging way. See how Gameplay gives high school students deepened, enduring understandings of key concepts in the system of chemistry. Hear chemistry teachers share their experiences using the game in their classrooms.

Grant Writing: Pipelines, Partnerships, and Finding Funding

(General)

207A, Music City Center

Science Focus: GEN

Sponsor: Ward's Science

Rusti Berent, Ward's Science, West Henrietta, N.Y.

Explore proven strategies for finding science funding at the local, regional, state, and national levels. Learn how to implement in your planning process to secure the materials your students need to succeed. Leave this workshop armed with easy-to-implement tools, techniques, and resources to win funding.

Using Fables to Scaffold Inquiry-Based STEM Instruction and the Engineering Design Process

(Grades K–12)

207B, Music City Center

Science Focus: ETS1

Sponsor: Advancement Courses

Amanda Bickerstaff (amanda.bickerstaff@advancement-courses.com), Advancement Courses, New York, N.Y.

In this hands-on PD workshop, learn how to use the *Three Little Pigs* and other fables as a framework to have STEM instruction meet the NGSS and CCSS, develop authentic tasks and assessments, and integrate the engineering design process along with the four levels of inquiry.

Inquiry-Based Chemistry with Vernier

(Grades 9–College)

207C, Music City Center

Science Focus: PS, SEP

Sponsor: Vernier Software & Technology

Jack Randall (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.

Involving your students in inquiry-based chemistry can be easy and fun. Many investigations have already been designed and tested in our lab book, *Investigating Chemistry through Inquiry*. In this engaging hands-on workshop, conduct an inquiry-based chemistry investigation using Vernier sensors with a LabQuest 2 or Logger Pro computer software.

Elementary Science with Vernier

(Grades 3–6)

207D, Music City Center

Science Focus: GEN, SEP

Sponsor: Vernier Software & Technology

David Carter (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.

Learn how to incorporate Vernier sensors and data loggers into your elementary classroom. In this engaging hands-on STEM workshop, you will conduct an activity from our award-winning *Elementary Science with Vernier* lab manual that promotes student understanding of science, mathematics, and technology using an integrated teaching approach.

NGSS in the High School Biology Classroom

(Grades 9–College)

208A, Music City Center

Science Focus: LS1, PS1, PS2, PS3, SEP

Sponsor: Bio-Rad Laboratories

Kirk Brown, San Joaquin County Office of Education, Stockton, Calif.

Engage with Kirk Brown, a lead writer of the revised California science framework, to understand how to apply the three dimensions from the NGSS in your biology classroom. Gain practical insights and develop strategies to integrate

NGSS into your classroom. This interactive learning opportunity includes modeling, explanation, argumentation, and engineering practices.

National Geographic Educator Certification Program

(Grades P–12)

208B, Music City Center

Science Focus: GEN

Sponsor: National Geographic

Alison Szopinski (aszopinski@ngs.org), National Geographic Education, Washington, D.C.

Join us to learn about and help shape National Geographic's new Educator Certification Program. Complete Phase 1 of the process—learning about our new Learning Framework, which covers the skills and knowledge that teach kids about the world, empowering them to succeed and make it a better place. Also hear about how to undertake Phase 2 and Phase 3 of the certification process and, upon completion, be among the first Nat Geo Certified Educators in the nation.

Enhance Your AP Chemistry Course with POGIL™ Activities

(Grades 9–12)

209A, Music City Center

Science Focus: PS

Sponsor: Flinn Scientific, Inc.

Jillian Saddler, Flinn Scientific, Inc., Batavia, Ill.

Process-Oriented Guided Inquiry Learning (POGIL) activities guide students to construct new understandings while simultaneously developing key process skills, including critical thinking, problem solving, and collaboration. The new *POGIL Activities for AP Chemistry* manual includes 30 activities aligned with the College Board's recently revised AP chemistry curriculum.

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Life Cycle of Stars—From Birth to Catastrophic Death

(Grades 6–12)

209B, Music City Center

Science Focus: ESS1.A

Sponsor: Simulation Curriculum Corp.

Herb Koller, Simulation Curriculum Corp., Minnetonka, Minn.

Where do stars come from? What happens during their life cycle? Why must a star die? Where are stellar graveyards? Join us as we answer these and other questions using Simulation Curriculum's award-winning *Starry Night* lessons and learn how to access a free classroom-ready lesson.

The REAL Story of the Animal Kingdom on Planet Earth

(Grades 5–8)

209C, Music City Center

Science Focus: LS

Sponsor: Shape of Life

Nancy Burnett, Shape of Life, Carmel Valley, Calif.

Denise Ryan, Ryan+Forest.Hayes, Soquel, Calif.

Learn from a founder of the Monterey Bay Aquarium how sharing the greatest story every told on planet Earth—the evolution of the animal kingdom—through classroom media, can captivate students. Please join Nancy Burnett as she shares her experience and exquisite short videos, readings, illustrations, and amazing free resources for your classroom. All *Shape of Life* short videos are derived from the popular PBS series produced by the Shape of Life team. CCSS and NGSS resources available for all attendees.

Engaging Your Students Through the U.S. Fish & Wildlife Service's Conservation Connect

(Grades 3–8)

210, Music City Center

Science Focus: INF, LS1, LS2

Sponsor: U.S. Fish & Wildlife Service (FWS)

Randy Robinson and **Maria Parisi**, U.S. Fish & Wildlife Service, Falls Church, Va.

Learn the benefits and opportunities our free *Conservation Connect* video series offers you, in classrooms and in other settings. FWS' new web-based series connects students with conservation careers, wildlife species, and the technology we use to protect those species. Try out, discuss, and leave with educational resources aligned with the *Next Generation Science Standards* and *Common Core State Standards*, in English language arts and mathematics.

Make Science Come to Life

(Grades 1–5)

211, Music City Center

Science Focus: GEN, NGSS

Sponsor: LEGO Education

Laura Jackson, Anderson (S.C.) School District Five

Did you know LEGO® bricks can provide an engaging platform for making science come to life? Using LEGO Education solutions, elementary students can explore, create, and share discoveries as they build solutions to real-world, standards-based projects and deeply engage with science practices and the engineering design process. Come experience a resource that develops students' confidence to ask questions, find answers, and solve problems by putting discovery in their hands.

A Peek Behind the Curtain: Disney Parks Approach to Physics and Energy

(Grades 6–12)

212, Music City Center

Science Focus: ETS, PS

Sponsor: Disney Youth Programs

Joseph Cardello, Disney Parks Education Facilitator, Anaheim, Calif.

Join us for a peek into how Disney conducts in-park field trips that teach kids how Disney uses mechanical physics and elements, such as light and sound, to create world-class attractions and entertain guests from around the world.

Let's Get Helical

(Grades 8–College)

214, Music City Center

Science Focus: ETS1.A, ETS1.B, ETS2, LS1.A, LS1.B, LS3, LS4.A, LS4.D, CCC1, CCC2, CCC6, CCC7, SEP1, SEP2

Sponsor: MSOE Center for BioMolecular Modeling

Margaret Franzen (franzen@msoe.edu) and **Gina Vogt** (vogt@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

DNA can be viewed as a macromolecule or a source of genetic information. Explore both features with interactive DNA models and a paper bioinformatics exercise focusing on the beta subunit of hemoglobin. Examine the mutation that leads to sickle cell disease and the regulation of fetal and adult hemoglobin expression.

10:15–10:45 AM Presentations**Meet Me in the Middle Session: What the NGSS Mean to a Middle Level Teacher—Thoughts from a Member of the Writing Team***(Grades 5–8)**Broadway B, Omni*

Science Focus: GEN, NGSS

Kenneth Huff (*kenneth.huff@roadrunner.com*), NSTA Director, Middle Level, and Williamsville (N.Y.) Central School District

Join a member of the NGSS writing team to learn how these standards impact a middle level classroom.

Meet Me in the Middle Session: Roundtable Discussions for Middle School Educators, Part 1*(Grades 5–9)**Broadway E/F, Omni*

Science Focus: GEN, NGSS

Todd Hoover (*@DrToddHoover*; *thoove2@bloomu.edu*), Bloomsburg University of Pennsylvania, Bloomsburg**Diana Cost** (*dcost@gleps.org*), NMLSTA President, and Global Learning Charter Public School, New Bedford, Mass.**Mary Lou Lipscomb** (*mllscience@aol.com*), National Middle Level Science Teachers Association, Naperville, Ill.**Patty McGinnis** (*pattymcginnis1@gmail.com*), Arcola Intermediate School, Eagleville, Pa.**Lisa Brosnick** (*lbrosnick@gmail.com*), North Collins Central School, North Collins, N.Y.**Nealyn Dunlop**, Roosevelt Middle School, New Bedford, Mass.**Matthew Hartman**, eCYBERMISSION Content Manager and **Cheryl Long** (*clong@nsta.org*), eCYBERMISSION Outreach Specialist, NSTA, Arlington, Va.**Jill Lewis** (*jill.lewis@vwr.com*), Ward's Science, West Henrietta, N.Y.**Tom Loschiavo**, PASCO scientific, Roseville, Calif.**Wendy Peel** (*wpeel@ti.com*) and **Donald Tunstall** (*dtunstall@ti.com*), Texas Instruments, Dallas**Jaclyn Stallard**, Project Learning Tree, Washington, D.C. Join middle school teachers for roundtable discussions featuring topics related to the NGSS, science literacy, and more!**10:15–10:45 AM Hands-On Workshops****Meet Me in the Middle Session: Everyday Engineering***(Grades 5–9)**Broadway C, Omni*

Science Focus: ETS

Richard Moyer, University of Michigan–Dearborn

Engage in STEM activities related to everyday engineering (sweet spots on ball bats or how a plastic baggie seals) and learn how to integrate the four STEM disciplines into one lesson.

Meet Me in the Middle Session: Use Science to Support and Develop ELL Language Acquisition*(Grades 5–9)**Broadway D, Omni*

Science Focus: GEN

Melissa Sleeper (*onewhosleeps3@aol.com*), Gifford Middle School, Vero Beach, Fla.

The NGSS supports science learning for all students. We will focus on English language learners and the language support and discourse strategies that engage all students regardless of their English proficiency. Activities will be geared toward developing a classroom culture that ensures that all student voices are included and respected. Take home engaging lessons.

10:30 AM–12:30 PM Meeting**Association of Multicultural Science Education General Membership Meeting***Broadway K, Omni*For details, please visit www.amsek16.org.**10:45–11:45 AM Exhibitor Workshop****Climate Change Series II: Bringing Climate Change Closer to Home: U.S. Forest Service Climate Change Education Resources***(Grades 6–12)**201A, Music City Center*

Science Focus: ESS3

Sponsor: NOAA Ocean Service

Amtchat Edwards (*mkedwards@fs.fed.us*), U.S. Forest Service, Washington, D.C.

Explore Forest Service climate change education resources. Collect and enter tree data to quantify and value services trees provide. Use computer modeling to visualize potential effects to birds and trees through varying emissions scenarios. Bring climate change closer to home; helping to answer, “What does climate change mean to me?”

11:00–11:30 AM Presentations

Robotics Project for Elementary and Middle Grades Preservice Teachers

(Grades 3–8)

106A, Music City Center

Science Focus: ETS, SEP

Deborah McAllister, The University of Tennessee at Chattanooga

Hear about the work accomplished, as well as the mathematics and science skills addressed by using robotics with preservice teachers in elementary and middle grades programs.

Meet Me in the Middle Session: Roundtable Discussion—Awards, Recognition, and Competitions for Middle School Educators

(Grades 5–9)

Broadway B, Omni

Science Focus: GEN

Diana Wiig (dwiig@uwyo.edu), University of Wyoming, Laramie

Acacia McKenna, Director, Competitions, NSTA, Arlington Va.

The NSTA Awards and Recognition committee, along with the Science Education Competitions, will present a roundtable discussion on the awards and competitions for middle school teachers.

Meet Me in the Middle Session: Science and Special Education—How to Make It Work

(Grades 5–9)

Broadway D, Omni

Science Focus: GEN, NGSS

Kathleen Brooks, Retired Educator/Educational Consultant, Westbrook, Conn.

Suggestions are offered for science teachers to work with special education teachers who are weak in science content. . . for the benefit of all students.



Meet Me in the Middle Session: Roundtable Discussions for Middle School Educators, Part 2

(Grades 5–9)

Broadway E/F, Omni

Science Focus: GEN, NGSS

Todd Hoover (@DrToddHoover; thoove2@bloomu.edu), Bloomsburg University of Pennsylvania, Bloomsburg

Diana Cost (dcost@gleps.org), NMLSTA President, and Global Learning Charter Public School, New Bedford, Mass.

Mary Lou Lipscomb (mllscience@aol.com), National Middle Level Science Teachers Association, Naperville, Ill.

Patty McGinnis (pattymcginnis1@gmail.com), Arcola Intermediate School, Eagleville, Pa.

Kathy Biernat (kbiernat@stmaryeg.org), St. Mary's Visitation School, Elm Grove, Wis.

Jennifer Hammond (teacheratsea@noaa.gov), NOAA Teacher at Sea Program, Silver Spring, Md.

Jill Lewis (jill.lewis@vwr.com), Ward's Science, West Henrietta, N.Y.

Tom Loschiavo, PASCO scientific, Roseville, Calif.

Wendy Peel (wpeel@ti.com) and **Donald Tunstall** (dtunstall@ti.com), Texas Instruments, Dallas

Join middle school teachers for roundtable discussions featuring topics related to the NGSS, science literacy, and more!

Spoiling Everything They Love: The Truth Behind Pizza and Other Foods

(Grades 6–12)

Cumberland 5, Omni

Science Focus: GEN, SEP1, SEP6, SEP8

William Bowman (wbowman@pkwy.k12.mo.us), Parkway North High School, Saint Louis, Mo.

Monica Bowman (@MBowmanScience; mbowman@ladueschools.net), Ladue Horton Watkins High School, Saint Louis, Mo.

Learn how to use food items that many students are familiar with to discuss the interrelationships between the history, ecology, geology, chemistry, and biology of this food.

Community Stakeholders: Banding Together to Leverage Green Schools

(Grades K–12)

Fisk Two, Renaissance

Science Focus: GEN, NGSS

Laurel Kohl (kohl1@easternct.edu), The Institute for Sustainable Energy, Willimantic, Conn.

Connecticut's Green LEAF Schools model—NGSS/CCSS skills supported by a network of state agency programs and informal education providers—has turned our schools and school yards into learning laboratories. Come find out how.

11:00–11:30 AM Hands-On Workshop**Meet Me in the Middle Session: More Engineering to the Standards***(Grades 5–8)**Broadway C, Omni*

Science Focus: ESS, ETS, SEP6

Susan German, Hallsville Middle School, Hallsville, Mo. Come for more lessons related to NGSS engineering performance expectations. Lessons will be shared via electronic means and limited hands-on activity demonstrated.

11:00 AM–12 Noon American Geophysical Union (AGU) Lecture**Curiosity's Adventures in Gale Crater, Mars***(General)**Grand Ballroom C2, Music City Center*

Science Focus: ESS



Linda Kah (*lckah@utk.edu*), Kenneth G. Walker Associate Professor, Carbonate Sedimentology and Geochemistry, Dept. of Earth and Planetary Sciences, The University of Tennessee, Knoxville

Mars is an enigma. Despite evidence from the Viking orbiters of a landscape dissected by channels, the

Viking landers revealed the surface of Mars to be a desolate place, shaped primarily by wind rather than water. More recent data from the MER rovers has defined a world still dominated by wind, but a world in which water occurred both within the subsurface, and at least episodically, upon the land surface. With Curiosity's investigation of Gale crater, currently pressing onward toward Mount Sharp, we continue to glimpse a land with a far more complex history of water than first imagined.

Linda C. Kah is a Kenneth G. Walker associate professor in the Carbonate Sedimentology and Geochemistry Department of Earth and Planetary Sciences at The University of Tennessee. She has been pursuing her love of science since kindergarten, when she announced her intention to become a geologist.

In her research, Linda combines her knowledge of geology, isotope geochemistry, and biology to decipher how ecosystems arise on planets, and how biological processes fundamentally interact with, and even change, geological systems. Her research has taken her to some of the most remote places on Earth, including the Canadian Arctic, Saharan West Africa, and the high Andes of Argentina; and continues to take her to even more remote localities as she explores Gale Crater with NASA's Mars Science Laboratory mission.

11:00 AM–12 Noon Presentations**NSTA Press® Session: Diving into the NGSS Disciplinary Core Ideas: How and Why They Are Important for Teaching and Learning***(Grades K–12)**101D, Music City Center*

Science Focus: GEN, NGSS

Ann Rivet (*@arivet6*; *rivet@tc.columbia.edu*), Teachers College, Columbia University, New York, N.Y.

Ravit Golan Duncan (*ravit.duncan@gse.rutgers.edu*), Rutgers Graduate School of Education, New Brunswick, N.J.

Joseph Krajcik (*krajcik@msu.edu*), CREATE for STEM Institute, Michigan State University, East Lansing

Book editors discuss the disciplinary core ideas across physical, life, Earth and space sciences, and engineering through rich descriptions of phenomena, learning progressions, and teaching resources.

**Making STEAM Rise in Your School***(Grades 4–8)**103B, Music City Center*

Science Focus: ETS, INF

Natalie Coleman (*@afterthepeanut*; *ncoleman@joliet86.org*), Joliet (Ill.) Public Schools District 86

Find out how one school district went from two after-school STEM programs to more than 30 with the help of community and educational institutions.

Ten NGSS Talking Points: How to Talk About the Next Generation Science Standards in Your School and Community*(Grades K–12)**104A, Music City Center*

Science Focus: GEN, NGSS

Cindy Workosky (*cindy_w@nsta.org*), Communications Specialist, NSTA, Arlington, Va.

Talking about educational standards is an expected task of teachers and administrators. It's an opportunity to help parents and others know what teachers will be teaching and what students will be learning. Join me and learn more about the goals of the NGSS and get 10 tips for how you can talk about them in your school and community.

Sensing Science: Temperature and Heat Readiness for Early Elementary Students

(Grades K–2) *104B, Music City Center*
Science Focus: PS1, PS3, CCC5, SEP1, SEP2

Carolyn Staudt (*cstaudt@concord.org*), The Concord Consortium, Concord, Mass.

George Forman, Professor Emeritus of Education, UMass Amherst, Mass.

Participate in Sensing Science and uncover your children's ability to reason with kinetic theory of matter using visualizations, including models, probes, infrared technology, and stories.

INF Using TALES to Enhance Learning in an After-School Program

(Grades 1–8) *Davidson A2/3, Music City Center*
Science Focus: ESS, INF

Renard Harris (*harrisr@cofc.edu*), **Cynthia Hall** (*hallcr@cofc.edu*), and **Willie McCray** (*mccraywc@g.cofc.edu*), College of Charleston, S.C.

Hear how we used Teaching And Learning with Engaging Stories (TALES) as a strategy to enhance socio-economically disadvantaged students' learning in an after-school program. We will share our collaborative process of creating engaging content-based oral stories that weave Earth and space science concepts.

Trials and Tribulations of Project-Based Learning: A Chemistry Team's Vignette

(Grades 9–12) *Broadway A, Omni*
Science Focus: PS, CCC, SEP

Julie Lockhart, Energy Institute High School, Houston, Tex.

A team of two chemistry teachers who have embarked on the journey of Project-Based Learning relate their successes, best practices, and planning resources.

Earthquakes—From Paper to ArcGIS

(Grades 9–12) *101 A/B, Music City Center*
Science Focus: ESS2.B, ESS3.B, CCC1, CCC2, CCC3, SEP2, SEP4, SEP7, SEP8

Mary Shane (*shanem@interact.ccsd.net*), Advanced Technologies Academy, Las Vegas, Nev.

Let's take a cookbook lab and infuse it with multiple layers of technology, even having it meet the NGSS.

INF Best Practices in Community Partnerships: It's a Two-Way Street!

(General) *Cumberland 1, Omni*
Science Focus: INF

Keri Randolph, Public Education Foundation, Chattanooga, Tenn.

I'll share lessons learned over four years of supporting and cultivating community partnerships with public schools to support STEM education.

Science for All: Including Diverse Learners

(General) *Cumberland 2, Omni*
Science Focus: GEN

Vicki Massey, Higley Unified School District #60, Gilbert, Ariz.

Emphasis will be placed on leaders in science facilitating professional development relating to helping diverse learners become scientifically literate.

Academic Language: More Vocabulary Strategies to Enhance Engagement and Learning

(Grades 6–12) *Cumberland 3, Omni*
Science Focus: GEN

Lauren Rentfro (*rentfrla@lewisu.edu*), **Tiffany Albers-Lopez** (*tiffanyaalberslope@lewisu.edu*), and **Christopher Blogg** (*cjblogg34@comcast.net*), Lewis University, Romeoville, Ill.

This activity-based presentation shares more than 30 vocabulary games and strategies to enhance student learning and the use of academic vocabulary in the science classroom.

Brain Science: Resources for the Classroom

(Grades 6–College) *Cumberland 4, Omni*
Science Focus: LS1.A, LS1.B, LS1.D, LS4.A, LS4.B, LS4.C

Robert Steiner (*rsteiner@amnh.org*) and **David Randle** (*drandle@amnh.org*), American Museum of Natural History, New York, NY

Robert Payo (*robert.payo@dmns.org*), Denver Museum of Nature & Science, Denver, Colo.

Tammy Cook-Endres (*tcook-endres@exploratorium.edu*) and **Hilleary Osheroff** (*hosheroff@exploratorium.edu*), Exploratorium, San Francisco, Calif.

Exceptional brain science resources from the American Museum of Natural History, the Denver Museum of Nature and Science, and the Exploratorium will be presented.

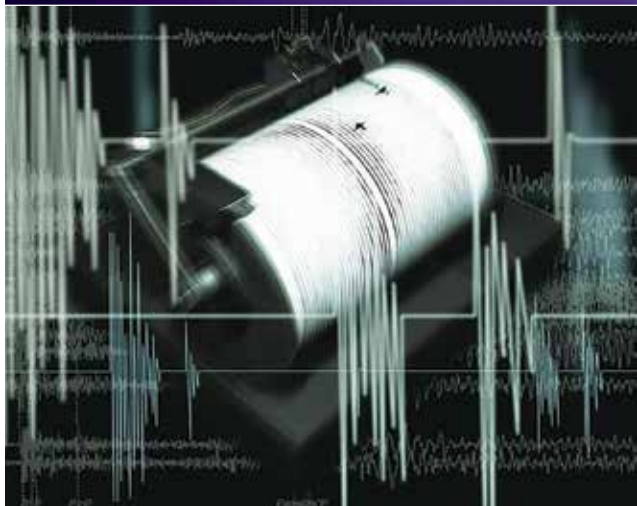
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Debatable Demos

(Grades 5–10)

Electric, Omni

Science Focus: PS1, PS2, SEP1, SEP3, SEP4, SEP7

Richard Frazier (richard_frazier@hotmail.com), American Embassy School—New Delhi, India

Hear about a variety of debatable demonstrations. Challenges to these demos offer rich opportunities for investigation consistent with the spirit of the NGSS.

NSELA Session: Tools for Science Leaders

(General)

Legends A, Omni

Science Focus: GEN, NGSS

Elizabeth Mulkerrin ([@nselascience](https://twitter.com/nselascience); elizabethm@omahazoo.com), NSELA President, and Omaha's Henry Doorly Zoo and Aquarium, Omaha, Neb.

Presider: Kenn Heydrick, The University of Texas at Tyler
Come learn about the various tools and strategies that science leaders can use to enhance teaching and learning in their outreach.

Before and After Retirement—Practicalities and Possibilities

(General)

Mockingbird 2, Omni

Science Focus: GEN

Teshia Birts ([@TeshiaBirts](https://twitter.com/TeshiaBirts); tbirts@nsta.org), Senior Director of Membership Development and Chapter Relations, NSTA, Arlington, Va.

Linda Smith, Retired Educator, Elmer, N.J.

The NSTA Retired Advisory Board invites you to a vibrant and useful information-sharing session. Join your fellow colleagues and share your ideas about staying active both in and out of the profession.

ACT's National Curriculum Survey: Insights About Science Curricula on a National Scale

(General) *Mockingbird 4, Omni*

Science Focus: GEN, NGSS

Robert Hamilton (brian.hamilton@act.org), **Stephanie Stratton**, and **Jay Thomas** (jay.thomas@act.org), ACT, Inc., Iowa City, Iowa

Review results of ACT's unique comprehensive survey of K–12 and postsecondary educators and hear how the results relate to the *Next Generation Science Standards*.

HS Engineering 4.0: Going from One Engineering Class to an Articulated Four-Year Science/CVTE Engineering Program

(Grades 9–12) *Music Row 1, Omni*

Science Focus: ETS, SEP

Amy Winston (amy_winston@newton.k12.ma.us), Newton North High School, Newton, Mass.

Find out about our homegrown curriculum, program expansion and articulation, and engineering-infused science classes. Develop your own “next steps” for expanding (or starting) engineering offerings at home.

Reviewers Needed for NSTA's Journals

(General) *Music Row 2, Omni*

Science Focus: GEN, NGSS

Ken Roberts, Assistant Executive Director, Journals, NSTA, Arlington, Va.

Meet with editors to learn how you can join a manuscript review panel for one of NSTA's award-winning journals.

Nuts and Bolts of Science Program Leadership at the District Level

(Grades K–12) *Music Row 3, Omni*

Science Focus: GEN

Kelly Price-Colley (@kpricega; kellyrprice@comcast.net), NSTA Director, Coordination and Supervision of Science Teaching, and Forsyth County Schools, Cumming, Ga.

You have been promoted to the role of district science leader. Congratulations! Now what do you tackle first? Learn from the seasoned experts on the NSTA Coordination and Supervision of Science Committee.

Designing a Districtwide K–12 Science Program

(General) *Music Row 5, Omni*

Science Focus: GEN, INF, NGSS

Caleb Cheung (caleb.cheung@ousd.k12.ca.us), Oakland (Calif.) Unified School District

Come hear the story of science in Oakland, California. Learn how to design, organize, resource, nurture, and implement a districtwide science program that meets the NGSS.

Teacher Researcher Day Session: Project-Based Learning as a Tool for Success

(Grades 6–College) *East Ballroom/Group 1, Renaissance*

Science Focus: GEN, NGSS

Don Frazier, Albuquerque Institute for Mathematics and Science, Albuquerque, N.Mex.

Let's cover how to use Project-Based Learning to promote student success within traditional upper-level history, math, and science within middle school and high school settings.

Teacher Researcher Day Session: Exploring Geoscience Methods: An InTeGrate Module for Preservice Secondary Science Teachers

(Grades 9–College) *East Ballroom/Group 2, Renaissance*

Science Focus: ESS3.D, CCC1, CCC4, SEP2, SEP7

Jeff Thomas (thomasjed@ccsu.edu), Central Connecticut State University, New Britain

This three-part module aims to improve preservice science teachers' understanding of the methods of geoscience by engaging them in an intensive, inquiry-based climate change activity.

Teacher Researcher Day Session: Claims and Evidence: Developing Scientific Argumentation for ELL, IEP, GT, and General Education Middle School Students

(Grades 6–8) *East Ballroom/Group 4, Renaissance*

Science Focus: GEN, SEP7

Kathy Kennedy (@kbkennedy7; kkenned3@stevens.edu), Stevens Institute of Technology, Hoboken, N.J.

Caitlin Folkes (caitfolkes@gmail.com), Frelinghuysen Middle School, Morristown, N.J.

Explore best practices learned from an action research project that examines outcomes of varied strategies for developing student argumentation skills in middle school science.

All About Those Bass-ic Materials in Science

(Grades K–12) *Fisk One, Renaissance*

Science Focus: GEN

Ashley Lagas (@MissLagas; lagasa@holliston.k12.ma.us), Robert H. Adams Middle School, Holliston, Mass.

Rebekah Fuerst (@Fuerstscience; rebekah.fuerst@ucps.k12.nc.us), Parkwood Middle School, Monroe, N.C.

Buy less, learn more! Engage in hands-on activities that you can immediately use in your classroom. CHEETOS®, cookies, pretzels, Pop-Tarts®...the fun is just beginning!

Transforming Teaching into Three-Dimensional Learning

(Grades 4–12) *West Ballroom, Renaissance*

Science Focus: GEN, NGSS

Jan Douglas (@JanKWDouglas; jan.douglas@pccsk12.com), Plymouth-Canton Community Schools, Plymouth, Mich.

Jan Coratti (jan.coratti@pccsk12.com), East Middle School, Plymouth, Mich.

Barbara Johnson (dbazjohn@comcast.net), Pioneer Middle School, Plymouth, Mich.

Deb Stephens (deborah.stephens@pccsk12.com), Central Middle School, Canton, Mich.

A team of middle school department chairs will describe how to engage all students in the three-dimensional learning of the NGSS by using collaborative whiteboards.



—Courtesy of Jacob Slaton

11:00 AM–12 Noon Hands-On Workshops



NSTA Press® Session: *Bringing Outdoor Science In*

(Grades K–8) *101C, Music City Center*

Science Focus: LS, CCC

Steve Rich (@bflyguy; bflywriter@comcast.net), University of West Georgia, Carrollton

Explore STEM in the school yard with NSTA Press books, and find out how birds and students can “engineer” with sticks and stems. Free seeds!



Your Kids Can, Too! Scientific Argumentation for All Students

(Grades 5–12) *101E, Music City Center*

Science Focus: LS1.B, CCC1, SEP3, SEP4, SEP6, SEP7

Deena Gould (deena.gould@asu.edu), Arizona State University, Tempe

Come participate in exploration, meaning-making, and argumentation about core concepts in life sciences. Experience strategies, resources, and real examples for success with English language learners, as well as all learners.

3D Revamping Our Best Earthquake Lessons with Argument-Driven Inquiry to Better Target the NGSS

(Grades 6–12) *103A, Music City Center*

Science Focus: ESS2.B, CCC4, SEP7

Michael Hubenthal, IRIS, Washington, D.C.

We have adapted several great earthquake-related lessons using argument-driven inquiry to make these lessons really shake (and enhance their NGSS three-dimensional learning)!



Come Fly with Us!

(Grades 4–7)

103C, Music City Center

Science Focus: ETS1, PS2.A, CCC2

Karen Umeda (karen_umeda@notes.k12.hi.us), Hawaii State Dept. of Education, Pearl City

Garrett Arakawa (garrett_arakawa@notes.k12.hi.us) and **Annette Tanaka** (tanakaanet@hawaii.rr.com), Momilani Elementary School, Pearl City, Hawaii

Join us as we share how a STEM program might be built at your school. Explore a STEM unit that addresses the NGSS performance expectations and integrates history and English language arts. Engage in an engineering challenge that applies the forces of flight!

Supporting English Language Learners in STEM Education Through Engagement in Engineering

(Grades K–5)

104C, Music City Center

Science Focus: ETS

Nicole O’Neil (@eie_org; noneil@mos.org), Museum of Science, Boston, Mass.

Emphasis will be placed on supporting English language learners in elementary classrooms. Come engage in background building around a science concept connected with a hands-on engineering activity.

Reframing Classic Elementary Science Lessons with the NGSS

(Grades K–5)

104D, Music City Center

Science Focus: GEN, NGSS

David Kleiner (dkleiner@cliftonschoools.net), School 13, Clifton, N.J.

Teachers—are you overstressed and underwhelmed by the NGSS and CCSS? Deepen and broaden “old school” labs by applying the new standards. We will revisit some familiar elementary lessons, reworking them through the lens of the science and engineering practices and crosscutting concepts, and offer suggestions to help you build on what you have always done, rather than start from scratch with the NGSS.



NSTA Press® Session: Learn Strategies to Help You Implement the NGSS Practices!

(General)

104E, Music City Center

Science Focus: GEN, SEP

Susan Koba (skoba@cox.net), Science Education Consultant, Omaha, Neb.

Anne Tweed, 2004–2005 NSTA President, and McREL International, Denver, Colo.

Use instructional tools that help provide students with multiple opportunities to learn, promote linguistic and nonlinguistic approaches to teaching, and support NGSS practices. Handouts!

Let's Get Physical—From Force and Friction to Water and Weather

(Grades P–3)

105A, Music City Center

Science Focus: PS

Ruth Ruud (ruudruth61@gmail.com), Cleveland State University, Cleveland, Ohio

Juliana Texley (jtexley@att.net), NSTA Retiring President, and Science Writer/Instructor, Boca Raton, Fla.

Don't look now, but the CCSS asks that you teach physical sciences as early as kindergarten, and the NGSS have very specific goals for early primary. No more procrastinating! The good news is that you have your equipment. Come get easy activities, lit basics, and basic teacher background so that you can start right away!

How to Assess Three-Dimensional Learning in Your Classroom: Building Tasks That Work

(Grades K–8)

105B, Music City Center

Science Focus: GEN, NGSS

Katie Van Horne (@dizzvh; katie.vanhorne@colorado.edu) and **William Penuel** (@bpenuel; LearnDBIR; william.penuel@colorado.edu), University of Colorado Boulder

Philip Bell (@philipbell; pbell@uw.edu), University of Washington, Seattle

Analyze assessment tasks, discuss strengths of these tasks, and explore how they can be improved to better elicit 3D science learning.

The 6th Mass Extinction: Student Inquiry-Based Lessons on the Decline of Earth's Biodiversity

(Grades 9–12)

106B, Music City Center

Science Focus: LS2.A, LS4.C

Amber Willis (asb9616@lausd.net), Downtown Magnets High School, Los Angeles, Calif.

This workshop guides teachers through two units to teach the NGSS and CCSS evolution and ecology requirements. Students explore mass extinctions of the past and compare with the current decline in biodiversity.

Ocean Plastic Pollution: Examining Issues and Solutions in a Middle School Classroom

(Grades 6–8)

106C, Music City Center

Science Focus: ESS3.C, PS1.A, CCC6, SEP1

Mary Whaley (mwhaley@mbayaq.org), Monterey Bay Aquarium, Monterey, Calif.

Enrich your classroom with NGSS-focused activities on issues and solutions surrounding plastic pollution. Activities will highlight the physical and chemical properties of plastics, including density and buoyancy. Door prizes!

Using STEM to Fight the Zombies!

(Grades 7–12)

Legends B, Omni

Science Focus: GEN

Jeffrey Lukens, Sioux Falls (S.Dak.) School District

Use the popularity of zombies to make STEM become “un-dead” in your science classroom! Make sure to bring your brains to this hands-on session.

#askNSTA

How can I find funds to attend an NSTA conference?

Where can I find free articles tailored to my grade level and subject area?

What does NSTA have for student teachers?

What are the Next Generation Science Standards?

The #askNSTA Lounge is *the* place in Nashville to learn more about NSTA Membership and become part of the group who is crafting the future of science education!

#NSTA16

Come by booth #934 in the Exhibit Hall and
ASK US ANYTHING!

NSTA National
Science
Teachers
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Free Online Software for Visualizing Data Across Multiple Disciplines

(Grades 6–College)

Legends C, Omni

Science Focus: GEN, SEP4, SEP5, SEP7

William Finzer (wfinzer@me.com), The Concord Consortium, Emeryville, Calif.

Experience data visualization activities from multiple disciplines using free online software from the NSF-supported Common Online Data Analysis Platform (CODAP) project at Concord Consortium. Bring your own laptop!

BSCS Pathway Session: Designing Effective Professional Development for the Next Generation Science Standards

(Grades P–12)

Legends D, Omni

Science Focus: GEN, NGSS

Paul Numedahl, BSCS, Colorado Springs, Colo.

What professional development experiences will help teachers understand the three-dimensional aspects of the NGSS and the ways they impact teaching? How can these changes be systemic and sustainable? This session will introduce a model for planning effective science professional development experiences focused on the NGSS and explore the questions that district leaders, teacher leaders, and PD providers need to ask before the PD begins.



Designing Design: A New Model for 21st-Century Teaching

(Grades 3–12)

Legends E, Omni

Science Focus: ETS, SEP1, SEP2, SEP6, SEP8

Leah Hirsch (@Leah_B_Hirsch) and **Kate Selkirk**, Quest to Learn, New York, N.Y.

Complete a hands-on design challenge and explore how to use the design process to promote a classroom culture of innovation, collaboration, and critical thinking.

Science Can Flow Like Poetry!

(Grades 4–10)

Legends F, Omni

Science Focus: GEN, NGSS

Emily Millwood (emily.millwood@dcs.edu) and **Jenny Letson** (jenny.letson@dcs.edu), Oak Park Middle School, Decatur, Ala.

Carolyn Pistorius (pistorc@uah.edu), The University of Alabama in Huntsville

Check out how we teach poetry through science, as well as other forms of scientific literacy! We will do an inquiry-based hands-on lesson and weave writing and art through it.

Shifting Your Lessons to Target NGSS Science and Engineering Practices Using the NextGen ASET Rubrics

(Grades K–12)

Legends G, Omni

Science Focus: GEN, SEP

Corinne Lardy (corinne.lardy@csueastbay.edu), **Michele Korb** (michele.korb@csueastbay.edu), **Rachelle DiStefano** (rachelle.distefano@csueastbay.edu), and **Danika LeDuc** (danika.leduc@csueastbay.edu), California State University, East Bay, Hayward

Learn how to unpack, target, and apply specific elements of the NGSS science and engineering practices to your current curriculum using the NextGen ASET rubrics.

Academic Discussions That Promote Science Talk

(Grades 5–College)

Center Ballroom, Renaissance

Science Focus: ESS3, SEP8

Kelsey Voller (@missvoller; kelsey.voller@gmail.com), Pacific Heights Academy, Sabin, Minn.

Learn the key components of academic discussions that can support students in building and refining their ability to think, speak, and argue like a scientist.

11:15 AM–12 Noon Presentation**Fly with Banning!***(Grades 4–8)**Broadway H, Omni*

Science Focus: ETS2

Pat Smith (patsmithba@yahoo.com), Greatest Stories Never Told, Broken Arrow, Okla.**Louisa Jaggar** (louisajag@aol.com), Greatest Stories Never Told, Bethesda, Md.

James Herman Banning's life story will be a catalyst to teach the science of flight plus math, technology, and humanities in your classroom.

**11:30 AM–12 Noon Presentations****Teacher Researcher Day Session: Physical Science Understanding in the Young Learner***(Grades P–2)**East Ballroom/Group 3, Renaissance*

Science Focus: PS

Mary Hobbs (maryhobbs@utexas.edu), The University of Texas at Austin

Researchers discuss outcomes and implications of NSF-funded research looking at what four-year-olds know and can do in the physical sciences.

12 Noon–12:30 PM Presentation**Teacher Researcher Day Session: Leading from the Classroom: Science Inquiry Group Network***(General)**East Ballroom, Renaissance*

Science Focus: GEN, NGSS

Deborah Roberts-Harris (drober02@unm.edu), The University of New Mexico, Albuquerque

The Science Inquiry Group Network provides a way for interested teachers and teacher educators to continue talking with one another via the internet in between Teacher Researcher Days. Come engage in discussing ways to support teachers interested in inquiring into their own teaching practices and student learning.

INF Think Science—Taking It to the Streets*(General)**Fisk Two, Renaissance*

Science Focus: INF, NGSS

Donna Casanova (@dcasanova77; donna.casanova@ppsd.org), Providence (R.I.) Public Schools

To call out what the NGSS truly inspires us to do requires the interdisciplinary coordination of community partners. We will share examples of how the school district of Providence, Rhode Island, is making this shift tailored to each individual school.

Using Social Media to Enhance Science Class*(Grades 4–College)**Music City Ballroom, Renaissance*

Science Focus: GEN

Marielle Venturino (@msventurino; mari.venturino@gmail.com) and **Alicia Johal** (@ALICIAJOHAL; aliciajohal@gmail.com), Mar Vista Academy, San Diego, Calif.

Use social media to enhance your science class by connecting students with outside resources both at home and at school. See how two teachers seamlessly integrate social media into the school day, and use it to bring science home.

12 Noon–1:30 PM Exhibitor Workshops**Spicing Up Classical Physics Using Modern Examples***(Grades 11–12)**107B, Music City Center*

Science Focus: PS

Sponsor: Perimeter Institute for Theoretical Physics

Glenn Wagner and **Damian Pope**, Perimeter Institute for Theoretical Physics, Waterloo, Ont., Canada

Come see how modern physics can be explored within the classical curriculum with these easy-to-adapt examples for your classroom.

Learning Through Hands-On Activities*(Grades 7–College)**201B, Music City Center*

Science Focus: GEN, CCC, SEP1, SEP3

Sponsor: Nano-Link: Center for Nanotechnology Education

Billie Copley (billie@nano-link.org) and **Deb Newberry** (deb.newberry@dctc.edu), Nano-Link, Rosemount, Minn.

Nano-Link has created a series of topic-specific nanoscience modules that are centered around hands-on activities. Join in for some fun as you learn the nanoscience behind these very simple and easy-to-do experiments.

Sparking Interest with Chemistry

(Grades 9–12) 202B, Music City Center

Science Focus: PS

Sponsor: Houghton Mifflin Harcourt

Jerry Sarquis, Miami University, Oxford, Ohio

A. Mickey Sarquis, Professor Emeritus, Miami University—Middletown, Ohio

Join Mickey and Jerry Sarquis, the authors of *Modern Chemistry* and leaders in chemistry education, for this presentation of hands-on chemistry activities. This interactive workshop will feature classroom activities that you can use to spark your students' interest in chemistry! Learn new tips and tricks using readily available and inexpensive materials. Take home free materials!

Let Motion Show How Cars May Really Drive Themselves in the Future with the ERGOBOT!

(Grades 9–12) 207A, Music City Center

Science Focus: PS

Sponsor: Ward's Science

Samantha Bonelli, VWR Science Education, Rochester, N.Y.

Drive new learning in your classroom by teaching motion physics with robots. Using concepts such as position, velocity, acceleration, and vectors, we will explain how to use interactive simulations and animated interactive equations in order to program a small robot vehicle to complete a closed speed course—and eventually navigate a maze.

Biology with Vernier

(Grades 9–College) 207C, Music City Center

Science Focus: LS, SEP

Sponsor: Vernier Software & Technology

Colleen McDaniel (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.

Use Vernier sensors to conduct a variety of biology experiments from our popular lab books in this engaging hands-on workshop. Collect and analyze data using LabQuest 2, Logger Pro computer software, and mobile devices. Explore the wide range of tools from Vernier that promote understanding of biology concepts.

Physics with Vernier

(Grades 9–College) 207D, Music City Center

Science Focus: PS, SEP

Sponsor: Vernier Software & Technology

David Carter (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.

Use Vernier sensors to conduct a variety of physics experiments from our popular lab books in this engaging hands-on

workshop. Collect and analyze data using LabQuest 2 and Logger Pro computer software. Explore the wide range of tools that promote understanding of physics concepts.

From “Science Is for Others” to “Science Is for Me”—Hands-On Modules to Engage All Students

(Grades P–5) 208B, Music City Center

Science Focus: ETS

Sponsor: ETA hand2mind

Johannes Strobel, University of Missouri, Columbia Science/engineering carry strong stereotypes. Join us as we synthesize existing stereotypes and show how the strategies of hands-on integrated STEM can help address stereotypes and engage ALL your students.

Hands-On Integrated Science Activities for Middle School from Flinn Scientific

(Grades 6–8) 209A, Music City Center

Science Focus: ESS, LS, PS

Sponsor: Flinn Scientific, Inc.

Janet Hoekenga, Flinn Scientific, Inc., Batavia, Ill.

Hands-on science leads to minds-on learning! Flinn Scientific presents relevant and age-appropriate activities for middle school—integrating life, Earth, and physical science topics. Workshop participants perform and observe experiments designed to capture the curiosity and engage the energy of adolescent students. Handouts for all activities.

SAE Middle School Educational Offerings

(Grades 6–9) 209C, Music City Center

Science Focus: GEN, SEP

Sponsor: SAE International—A World In Motion Program

Kenneth Francis, SAE International, Warrendale, Pa.

Come see project-based STEM educational offerings from SAE—from the award-winning A World in Motion program with fuel cell, glider, and motorized toy challenges to Formula One™ with our Schools Technology Challenge, the world's largest STEM competition.

Citizen Science—From Classroom to Field with the U.S. Fish and Wildlife Service

(Grades 3–12) 210, Music City Center

Science Focus: GEN, INF

Sponsor: U.S. Fish & Wildlife Service (FWS)

Maria Parisi, Randy Robinson, and Tracy McCleaf, U.S. Fish & Wildlife Service, Falls Church, Va.

Learn best practices for using citizen science to connect learning with real-world problem solving. We'll share examples demonstrating how FWS partners with schools and others to engage students as scientists while introducing them

to careers. Join the dialog about applying these best practices in your setting. Leave knowing how to connect with FWS and access our educational resources.

Make Science Come to Life

(Grades 1–5)

211, Music City Center

Science Focus: GEN, NGSS

Sponsor: LEGO Education

Laura Jackson, Anderson (S.C.) School District Five

Did you know LEGO® bricks can provide an engaging platform for making science come to life? Using LEGO Education solutions, elementary students can explore, create, and share discoveries as they build solutions to real-world, standards-based projects and deeply engage with science practices and the engineering design process. Come experience a resource that develops students' confidence to ask questions, find answers, and solve problems by putting discovery in their hands.

Constructing and Crossing Cell Membranes

(Grades 5–College)

214, Music City Center

Science Focus: ESS2.A, ESS2.C, ESS2.D, LS1.A, LS2.A, LS2.B, LS2.C, PS1.A, CCC, SEP1, SEP2, SEP5

Sponsor: 3D Molecular Designs

Gina Vogt (vogt@msoe.edu) and **Margaret Franzen** (franzen@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Hook biology and chemistry students with models that demonstrate the chemical and physical properties of water and the membranes that separate cells from the surrounding environment. Use hands-on teaching tools to explore diffusion, osmosis, and the transmembrane proteins that facilitate the transport of polar molecules across the cell membrane.

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12:15–1:15 PM Exhibitor Workshop

Climate Change Series III: ClimateChangeLIVE: Engage Your Students in Learning and Being Part of the Climate Solution!

(Grades 6–12)

201A, Music City Center

Science Focus: ESS3

Sponsor: NOAA Ocean Service

Amtchat Edwards (mkedwards@fs.fed.us), U.S. Forest Service, Washington, D.C.

Discover an online treasure chest of climate change education resources to help you educate, inspire, and engage your students! Compiled are resources from 27 federal agencies and NGO partners, which include lesson plans, videos, webinars, and more. Youth from across the country provide examples of how their classes are part of the climate solution!

12:30–1:00 PM Presentations

3D Warm the Water to Save Your City: An Engineering and Educational Technology NGSS Student Assessment Task

(Grades 5–9)

103A, Music City Center

Science Focus: ETS1, PS1.A, PS3.A, PS3.B, CCC4, CCC5, CCC6, SEP

Joel Donna, 3Ring, Shakopee, Minn.

Find out how you can assess middle school students' three-dimensional learning of thermal energy transfer using a hands-on technology-enhanced student assessment task.



Empowering Our Students to Be Citizen Scientists!

(Grades P–12)

103B, Music City Center

Science Focus: GEN, CCC1, CCC7, SEP3, SEP4, SEP8

Susan Koppendray ([@teachspacemn](https://twitter.com/teachspacemn); skdrayer@calvinchristian.org), Calvin Christian School, Edina, Minn.

Hear how citizen science provides students with an established outlet for real science practice and application that meets the NGSS.

Conceptually Concrete

(Grades 9–12)

Acoustic, Omni

Science Focus: GEN

Teresa Ware ([@twware60](https://twitter.com/twware60); twware@tupeloschools.com) and **Monica Rowe** ([@monicadyerowe](https://twitter.com/monicadyerowe); mdrowe@tupeloschools.com), Tupelo High School, Tupelo, Miss.

Join two biology and chemistry teachers as they share how they make the abstract concrete in their diverse classrooms using an array of learning styles.



Meet Me in the Middle Session: Formative Assessment in the Classroom

(Grades 6–8)

Broadway A, Omni

Science Focus: GEN

Julie Pepperman, Heritage Middle School, Maryville, Tenn.

Get introduced to and be able to practice some formative assessment techniques that can help inform instructional practice and identify individual student needs.

Meet Me in the Middle Session: Know the “Dirty Dozen” for a Safer Lab Experience!

(Grades 5–8)

Broadway B, Omni

Science Focus: GEN, NGSS

Kenneth Roy ([@drroysafersci](https://twitter.com/drroysafersci); royk@glastonburyus.org), Glastonbury (Conn.) Public Schools

For a safer teaching/learning experience and a way to keep the middle school teacher out of legal entanglement, learn about the “Dirty Dozen” lab hazards!

Global Collaboration in the Science Classroom

(Grades K–12)

Cumberland 1, Omni

Science Focus: GEN, SEP1, SEP7, SEP8

Jacqueline Fernandez, LAYC Career Academy, Washington, D.C.

Find out how to find, establish, and maintain a collaboration with a science classroom on the other side of the world!

STEM for All*(Grades 9–12)**Cumberland 3, Omni*

Science Focus: GEN, SEP

Sarah Eales (sarah_eales@gwinnett.k12.ga.us) and **Hyunjin Son** (hyunjin_son@gwinnett.k12.ga.us), Peachtree Ridge High School, Suwanee, Ga.

Opening up a STEM program to a wide variety of students can be challenging. Come see how to integrate engineering, literacy, and real-life applications.

Eradicate Point Grubbing*(Grades 7–College)**Cumberland 4, Omni*

Science Focus: GEN

Timothy Goodwin (@TimGoodwinEdD; tgoodwin@bemidjistate.edu), Bemidji State University, Bemidji, Minn.

Hear how to grade students in a way that encourages academic risk-taking, provides richer engagement, and reduces cheating.

Gender Equitable Teaching Strategies for Engaging Girls in Engineering and Technology Pathways*(Grades 6–12)**Cumberland 5, Omni*

Science Focus: ETS, SEP1, SEP3, SEP6

Rita Karl (@SciGirls; rkarl@tpt.org) and **Sarah Carter** (scarter@tpt.org), Twin Cities Public Television, St. Paul, Minn.

Want to inspire more girls to consider technical and engineering pathways? Find out how to use research-based gender equity strategies to spark a girl's future!

Standards-Based Grading Strategies and Solutions*(Grades 6–College)**Electric, Omni*

Science Focus: GEN

Elizabeth Savage (@savageaggiesci; esavage@bcahs.com) and **Craig Johnson** (@aggiescience; cjohnson@bcahs.com), Bristol County Agricultural High School, Dighton, Mass.

Our whole science department has been using standards-based grading (SBG) for two years within a school with a traditional grading system. Come learn the strategies that have worked for us in our classrooms and how we integrated SBG into our school.

Chemical Action-Based Curriculum*(Grades 8–12)**Music Row 1, Omni*

Science Focus: ETS1, PS

Matthew Hayes (matt.hayes@grayson.kyschools.us), Grayson County High School, Leitchfield, Ky.

The wonder of science is being able to ask questions and use science to solve problems. Be exposed to a curriculum framework that incorporates a major chemical reaction as a unifying concept for each unit.

Teacher Researcher Day Session: Do Novice Elementary Teachers See Scientists in Their Classroom?*(Grades 1–8)**East Ballroom/Group 1, Renaissance*

Science Focus: GEN

Kathryn Watkins (watkins@unm.edu), The University of New Mexico, Albuquerque

Novice elementary teachers in a science methods course draw pictures of a scientist and then pictures of their students. What do the pictures tell about their lens as they view their students? We will examine pictures made by novice teachers of both scientists and their students. Discussion centers on perceptions and what can be done to adjust the lens of novice teachers to see their students as prospective scientists.

Teacher Researcher Day Session: What Issues Impact Maximizing Instructional Time When Using a Technology-Centered Curriculum?*(Grades 6–College)**East Ballroom/Group 2, Renaissance*

Science Focus: GEN

Zachary Kline, Albuquerque Institute for Mathematics and Science, Albuquerque, N.Mex.

We will take a look at my classroom experience using technology in the science classroom—open for questions and discussion.

Teacher Researcher Day Session: Communicating in Scientific Ways*(General)**East Ballroom/Group 4, Renaissance*

Science Focus: GEN, NGSS

Deborah Roberts-Harris (drober02@unm.edu), The University of New Mexico, Albuquerque

Let's discuss ways in which you engage your students in thinking/acting like scientists, and learn about our experiences!

12:30–1:00 PM Hands-On Workshops

Meet Me in the Middle Session: Citizen Science in YOUR Classroom

(Grades 5–8)

Broadway C, Omni

Science Focus: GEN, CCC1, CCC2

Lisa Milenkovic (@sleuthacademy; lisa.milenkovic@browardschools.com), Broward County Public Schools, Fort Lauderdale, Fla.

Leonora Shell (@YourWild_Life; @VeganBugLady; lea_shell@ncsu.edu), North Carolina State University, Raleigh Experience existing citizen science projects spanning a wide range of topics and activities. Learn how to quickly find and implement peer-reviewed projects appropriate for your classroom. Become a peer-reviewer through our Professional Development for Citizen Science in the Classroom module!

Meet Me in the Middle Session: Engineering Practice in Middle School Chemistry

(Grades 6–8)

Broadway D, Omni

Science Focus: ETS1, PS, SEP1, SEP3, SEP6

James Kessler, American Chemical Society, Washington, D.C.

Learn about and try a new engineering design lesson soon to be featured in the free teaching resource www.middle-school-chemistry.com.

12:30–1:30 PM Presentations



Write to Know Science

(Grades 3–12)

101E, Music City Center

Science Focus: GEN, NGSS

Lee Hughes (leoph@leeschools.net), Lee County Public Education Center, Fort Myers, Fla.

Learn about nonfiction writing prompts that support argumentation, discourse, and inquiry. Writing is a cognitive process wherein students “show what they know.” Prompts are research based and standards focused.

Bloom Where You Are Planted: Growing an Elementary STEM Program

(Grades K–5)

104A, Music City Center

Science Focus: GEN

Andrea Sagely (@OklahomaSTEM; asagely@baschools.org), Broken Arrow (Okla.) Public Schools

Learn how to cultivate successful STEM students at ANY school! Leave with program ideas, sample schedules/lessons, and a renewed inspiration for elementary STEM.

STEM for All: Building a Schoolwide STEM Program

(Grades K–5)

104B, Music City Center

Science Focus: GEN

Ted Komada (tkomada@fusd1.org) and **Joe Gutierrez** (jgutierrez@fusd1.org), Killip Elementary School, Flagstaff, Ariz.

Experience an overview of the components/processes for developing a schoolwide STEM program/academy.

Designing Classroom Assessments to Address NGSS Performance Expectations

(Grades 5–9)

105B, Music City Center

Science Focus: LS, PS, SEP2, SEP4, SEP7, SEP8

Tracy Bratzke (clownfish39@yahoo.com) and **Nicole McRee** (mcree.nicole@d46.org), Grayslake Middle School, Grayslake, Ill.

Come learn how to use NGSS performance expectations to design classroom assessments. Sample assessments will be provided that require students to incorporate models and use evidence to support their responses.

DIY: Solar Panels

(Grades 6–12)

106A, Music City Center

Science Focus: ETS2, CCC4, CCC5, CCC7, SEP2

Jessica Minton (mintonj04@gmail.com), Riverdale Elementary School (K–8), Germantown, Tenn.

Think STEM means only Science, Technology, Engineering, and Math? Think again. STEM also means Solar Technology Engaging Minds! Solar panels for the classroom.

Students with Inquiring Minds Are Scientists (SWIMAS): A Study of Elementary Inquiry Science

(Grades K–8)

Davidson A2/3, Music City Center

Science Focus: GEN, SEP1, SEP3, SEP4, SEP6, SEP8

Linda Cook, Coppell (Tex.) ISD

Learn about the processes, structures, and supports provided within this model of elementary student-driven inquiry science.

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NESTA and CIESIN Share: Exploring a Compendium of Online Resources for Teaching Earth Science

(Grades 6–College) Davidson B, Music City Center
Science Focus: ESS

Michael Passow (michael@earth2class.org), Dwight Morrow High School, Englewood, N.J.

Margaret Holzer (mholzer@monmouth.com), Chatham High School, Chatham, N.J.

Carla McAuliffe (carla_mcauliffe@terc.edu), TERC, Cambridge, Mass.

NESTA members will share exemplary educational websites, including the Center for International Earth Science Information Network, to help implement NGSS and state curricular standards programs.

STEM Educators Award-Winning Share-a-Thon

(Grades 6–12) Davidson C, Music City Center
Science Focus: GEN, NGSS

Jacqueline Fernandez (jackief82002@yahoo.com), LAYC Career Academy, Washington, D.C.

Brandie Freeman (@whsfreeman; brandie.freeman@bartow.k12.ga.us), Woodland High School, Cartersville, Ga.

Presider: Amanda Upton, Manager, Nominations and Teacher Awards Programs, NSTA, Arlington, Va.

Come learn about the latest STEM classroom initiatives by the PASCO STEM Educator award winners! Teachers will present their winning ideas at the middle school and high school levels.

School District and Community Engagement in STEM Education on the International Space Station...and Beyond

(Grades 5–College) Grand Ballroom C2, Music City Center
Science Focus: GEN, INF, NGSS

Jeff Goldstein, Arthur C. Clarke Institute for Space Education, Ellicott City, Md.

Let's discuss what happens when a community gets their own space program, engaging hundreds of students in experiment design, with one launching to the International Space Station. We'll also explore what happens when a community is given a model solar system.

Harmonizing Science and Math: Making High School Math Relevant

(Grades 9–12) Broadway G, Omni
Science Focus: GEN, SEP4, SEP5

Scott Reis (scottreis@k12tn.net), Unaka High School, Elizabethton, Tenn.

Help students gain a deeper and more meaningful understanding of both subjects by adding these integrated STEM

activities incorporating high school–level math into your science curriculum.

Dive into Engineering Design: Connecting Physical Science and Engineering Through Underwater Robotics

(Grades 6–12) Broadway H, Omni
Science Focus: ETS1, PS

Arthur Camins, Stevens Institute of Technology, Hoboken, N.J.

Learn about the potential and challenges of 3-D learning when middle school and high school youth engage in underwater robotics to connect engineering design and physical science.

Research Insights into Online Communities of Practice and Teacher Learning Online: NSTA Learning Center

(General) Broadway J, Omni
Science Focus: GEN

Al Byers (abyers@nsta.org), Associate Executive Director, Services Division, NSTA, Arlington, Va.

Hear about our latest research insights conducted by the American Institute for Research, North Carolina State University, and Edvantia for NSTA's e-PD portal.

Meeting the NGSS...Even When You Don't Have To

(Grades 6–12) Cumberland 2, Omni
Science Focus: ETS1, LS1.A, PS2, PS3.B, PS3.C, CCC1, CCC2, CCC3, CCC6, CCC7, SEP

David Zeiger (dzeiger@trinitychristian.org), Trinity Christian Academy, Addison, Tex.

What do a Rube Goldberg Project, Pig Autopsy CSI, and a Maple Seed Prototype have in common? Come get our lesson plans and find out!

Being a Unicorn: Preservice Teachers and Their Quest for a Professional Identity

(College) Mockingbird 2, Omni
Science Focus: GEN

Robbie Higdon, James Madison University, Harrisonburg, Va.

Preservice teachers share their experiences about finding their identity as emerging science educators. Student perspectives about their teacher education programs will be shared.

AMSE Session: Differentiating Instruction to Help All Students Reach Their Fullest Potential*(Grades P–8)**Music Row 2, Omni*

Science Focus: ESS2.D

Cherry Brewton (*cbrewton@georgiasouthern.edu*), Science Education Consultant, Statesboro, Ga.

Experience lessons designed to differentiate instruction and integrate the three dimensions in the NGSS: science and engineering practices, disciplinary core ideas, and crosscutting concepts.

Nuts and Bolts of Science Program Leadership at the School Level*(Grades K–12)**Music Row 3, Omni*

Science Focus: GEN

Kelly Price-Colley (*@kpricega; kellyrprice@comcast.net*), NSTA Director, Coordination and Supervision of Science Teaching, and Forsyth County Schools, Cumming, Ga.

You have been promoted to the role of science department chair. Congratulations! Now what do you tackle first? Learn from the seasoned experts on the NSTA Coordination and Supervision of Science Committee.

Science for Everyone! Engaging Science Instruction for Students with Profound Disabilities*(Grades P–12)**Fisk One, Renaissance*

Science Focus: GEN

Michele Hodson (*vvmhodson@mdeca.org*), Valley View Junior High School, Farmersville, Ohio

Discuss the unique science needs of students with profound disabilities. Leave with materials that can be used as soon as you return to your school!

Problem Solving Through Observation: The Mystery of Three Turning Dots*(Grades 5–12)**Fisk Two, Renaissance*

Science Focus: PS2, CCC2

Youngseok Jhun, Seoul National University of Education, Seoul, Republic of Korea

Hear about an activity based on discovery learning in which students employ observation and analysis to explain a physical phenomenon—velocity addition. Find out what happens when two film containers with colored dots are spinned.

Mindset and the Educational Revolution*(General)**Music City Ballroom, Renaissance*

Science Focus: GEN

Ramy Mahmoud, Williams High School, Plano, Tex.

Tired of consistently increasing apathy in your students every year? Learn how to transform your classroom to produce highly engaged risk takers using the book *Mindset*!

Three Dimensions, Vertical Alignment, and STEM: Sequential Skill Building for Student Success*(Grades K–12)**West Ballroom, Renaissance*

Science Focus: ETS1.A, ETS1.B, ETS2, PS2, PS3.B, PS3.C, PS4, CCC1, CCC2, CCC3, CCC4, CCC5, CCC6, SEP

Rabieh Hafza (*@drhafza; jamalhafza@att.net*), Atlanta (Ga.) Public Schools

Emphasis will be placed on implementing the NGSS three dimensions and vertical alignment to advance students' research skills and content knowledge in STEM-related classes.

12:30–1:30 PM Hands-On Workshops**NASA Aeronautics 101: Over a Century of Flight***(Grades P–12)**101 A/B, Music City Center*

Science Focus: ESS, PS

April Lanotte (*april.a.lanotte@nasa.gov*), NASA Aeronautics Research Mission Directorate, Calhan, Colo.

Celebrate more than 100 years of flight with NACA/NASA. Hands-on activities from the principles of flight to more complex aerodynamic physics will give everyone something to explore.

Supporting the NGSS and CCSS in Urban Elementary Classrooms*(Grades K–5)**101C, Music City Center*

Science Focus: GEN, NGSS

Dean Martin (*@drdiscover; dean.bpsscience@gmail.com*), Boston (Mass.) Public Schools

Explore a unique model for supporting schools in an urban system that supports an elementary science specialist in the classroom to improve student achievement.

■ ■ ■ **Lead with Science: Learn How to Use Science Tasks to Reinforce Common Core State Standards, in English Language Arts and Mathematics**

(Grades K–6/College) 103C, Music City Center
Science Focus: ETS, SEP

Deborah Black, Kenne State College, Keene, N.H.

Heather Pelkey (@mrs_pelkey; bahpelkey@comcast.net), Winchester School, Winchester, N.H.

Learn from K–6 teachers, college faculty, and preservice teachers how to use science tasks to reinforce *Common Core State Standards*, in English Language Arts and Mathematics. Explore ways to develop authentic interdisciplinary application tasks that rest on the science and engineering practices and draw from other content areas. Solve a complex problem confronting a fictional character from a book using science and engineering.

A Way with Words: Integrating Science, Engineering, and ELA in Elementary Classrooms

(Grades P–5) 104D, Music City Center
Science Focus: ETS, CCC, SEP1, SEP2, SEP6, SEP8

Brian Raygor (@ScienceWCBOE; @BrianRaygor; braygor@wcboe.org) and **Kevin Hill** (khill@wcboe.org), Wicomico Country Public Schools, Salisbury, Md.

Pemberton Elementary School, Salisbury, Md.

Science time getting squeezed by CCSS? In this interactive workshop, you'll use our tool to find STEM in any storybook and get your students excited about reading AND science. Receive a CD packed with classroom resources.

Universal Design for Learning: A Powerful Way to Teach Electric Currents

(Grades 4–5) 104E, Music City Center
Science Focus: PS3.B, CCC5, CCC6, SEP2

Kelly Gillstrom and **Deborah Hanuscin** (@Dhanuscin; hanuscind@missouri.edu), University of Missouri, Columbia
Through participation in a 5E (Engage, Explore, Explain, Elaborate, and Evaluate) learning cycle on electric currents, we'll show how Universal Design for Learning (UDL) can enhance the participation of all students.

Planting a School Garden on a Shoestring Budget

(Grades P–5) 105A, Music City Center
Science Focus: ESS2, LS1.C

Rebecca Kurson (tkurson@goldaochacademy.org), Golda Och Academy, West Orange, N.J.

Sprout new learning in your preK–5 classroom. Attention prospective gardeners, come find out how to start a school garden using just newspaper, tin cans, and old soda bottles.

Science Notebooks K–3

(Grades P–3) 106B, Music City Center

Science Focus: GEN, NGSS

Sheri Farmer, 93rd Street Elementary School, Los Angeles, Calif.

Science notebooking is easy to implement even with our littles! Students will use their notebooks as a learning tool while teachers will find the notebooks helpful with progress monitoring, informal assessment, and content understanding. Come learn ways to implement notebooking in K–3 science classes.

Smart Switches

(Grades 7–12) Legends A, Omni

Science Focus: ETS1, PS3, SEP1, SEP2, SEP3, SEP6

Jana Sebestik (@MSTEOffice; sebestik@illinois.edu) and **Samantha Lindgren** (@MSTEOffice; salindgr@illinois.edu), University of Illinois at Urbana-Champaign, Champaign

Use LEDs and copper tape to investigate switches that make decisions. Learn how power outages are minimized. Receive NGSS-focused kits and a classroom-ready activity booklet.

Using Modeling Activities in the High School Chemistry Class

(Grades 9–College) Legends B, Omni

Science Focus: PS, SEP2, SEP6

Michael Mury, American Chemical Society, Washington, D.C.

Visualization is difficult for many students. Join me as I discuss and demonstrate several modeling activities you can use in your chemistry class.

Taking Advantage of the Power of Google Drive

(Grades 4–College) Legends C, Omni

Science Focus: GEN, SEP4, SEP5, SEP7, SEP8

Mary Lightbody (lightbody.1@osu.edu), The Ohio State University at Newark

Integrate media literacy with science for powerful learning experiences. Learn what Google forms, spreadsheets, and other online tools do to foster science argumentation in your classroom. BYOD.

Quick 'n Easy GMO Detection: Engage Students with Real-World Biotechnology and Genetics

(Grades 7–College)

Legends D, Omni

Science Focus: LS3, CCC, SEP

Liss O’Connell (loconnell@dimanregional.org), Diman Regional Vocational Technical High School, Fall River, Mass.

Whitney Hagins, Massachusetts Biotechnology Education Foundation, Cambridge

Pamela Baptiste (pbaptiste@gnbvt.edu), Greater New Bedford Regional Vocational Technical High School, New Bedford, Mass.

Engage in a biotechnology activity to foster evidence-based arguments about GMOs—includes connections to NGSS life science core ideas, crosscutting concepts, and science practices. Virtual and hands-on resources!

Modeling in STEM Education with Examples from Climate Modeling

(Grades 6–College)

Legends F, Omni

Science Focus: ESS2.D, CCC4, CCC5, CCC7, SEP2, SEP5

Randy Russell, UCAR Center for Science Education, Boulder, Colo.

Join in for activities for teaching scientific modeling as it relates to various scientific disciplines, with specific examples drawn from climate modeling.

A Practical Guide for Aligning Existing Materials to the NGSS: The EQUiP Rubric

(Grades 9–College)

Legends G, Omni

Science Focus: GEN, NGSS

Hillary Lauren (@ImpactSciEd) and **Barbara Hug** (bhug@illinois.edu), University of Illinois at Urbana-Champaign, Champaign

Developers and teachers: Want to better align your curriculum to the NGSS? Gain experience and advice while evaluating an example lesson from Project NEURON.



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Using Models to Make All Students’ Thinking Visible and Revisable

(Grades 3–8)

Music Row 5, Omni

Science Focus: PS1.A, PS3.B, PS3.D, CCC2, CCC4, CCC5, SEP2, SEP4, SEP6, SEP7, SEP8

Claudio Vargas (claudio.vargas@ousd.org) and **Sonnie-Dae Ross** (sonnie.dae@ousd.k12.ca.us), Oakland (Calif.) Unified School District

Models are explanatory and predictive tools that support understanding of phenomena. Join us for an active exploration of strategies to create, revise, and discuss models.

Exploring Light and Color: Hands-On NGSS-Based Investigations from the Exploratorium

(Grades 3–College)

Center Ballroom, Renaissance

Science Focus: ETS1, PS4.A, PS4.B

Eric Muller (emuller@exploratorium.edu), Exploratorium, San Francisco, Calif.

We will cover basic optics, color mixing, and biology of the eye/brain system all with make-and-take, easy-to-do, content-rich “Snack” activities.

1:00–1:30 PM Presentations

Explaining Population Dynamics Through the Modeling of Long-Term Data on Hurricane Disturbance in Puerto Rico

(Grades 6–8)

103A, Music City Center

Science Focus: LS2.A, LS2.C, CCC1, CCC4, CCC7, SEP2, SEP4, SEP7, SEP8

Steven McGee (lponline_mcgee; mcgee@lponline.net), Northwestern University, Evanston, Ill.

Randi McGee-Tekula, The Learning Partnership, Western Springs, Ill.

What will happen to a tropical rain forest if it is struck by hurricanes more frequently? See a demonstration on using modeling to investigate that question.

Using Career Academies to Develop Community Partnerships in the Classroom

(Grades 9–12)

103B, Music City Center

Science Focus: GEN

Alicia Pressel (alicia.pressel@stjohns.k12.fl.us), St. Johns County School District, St. Augustine, Fla.

The Academy of Environmental and Urban Planning is a STEM academy that teaches students environmental science, technology, and engineering. Students have opportunities to earn industry certifications, gain real-world experience, and have internships through community partnerships.

Promoting Academic Integrity in Your Classroom

(Grades 9–12)

Acoustic, Omni

Science Focus: GEN

Stacia Hottle (SPEHottle; shottle@tampaprep.org), Tampa Preparatory School, Tampa, Fla.

Discussions about academic integrity don’t have to wait for a rule violation. Promoting academic integrity on a regular basis will prepare your students for success.

“Link-ing” to Learn

(Grades K–12)

Cumberland 1, Omni

Science Focus: GEN

Jill Weaver (jillsciteach; jill.weaver@valleyview.k12.oh.us), Valley View Junior High School, Farmersville, Ohio

Hear how “Link-ed” in for learning allows you to create a network of partners to successfully teach and engage your class in opportunities you never dared to dream possible.

Robotics in the Classroom

(Grades 9–12)

Cumberland 3, Omni

Science Focus: ETS

Jennifer Smit, Illinois Institute of Technology, Chicago
Students from a Chicago Public School’s high school participate in a competitive robotics competition each school year. Funded by sponsors, including NASA, Baxter, Google, and 3M, this program creates opportunities for students to access real-world engineering experiences and inspire them to find the value of science, technology, and engineering in society. Find out how to modify the robotics competition for the classroom.

Educating for Ecological Identity

(General)

Cumberland 4, Omni

Science Focus: ESS

Timothy Goodwin (TimGoodwinEdD; tgoodwin@bemidjistate.edu), Bemidji State University, Bemidji, Minn.

It isn’t enough to teach ecology and environmental issues. We also need to help students understand their ecological identity if we are to avert an ecological crisis.

Fish Kill! A Three-Dimensional Learning Unit

(Grades 6–10) *Cumberland 5, Omni*
 Science Focus: LS2.C, CCC1, CCC2, CCC4, CCC5, CCC7, SEP

Marsha Bednarski (*bednarskim@ccsu.edu*), Central Connecticut State University, New Britain

Begin with a phenomenon, end with an engineering solution! Discover how to integrate the three dimensions to design instruction that supports best practices for learning.

INF The Environmental Science Summer Research Experience for Young Women

(Grades 9–College) *Electric, Omni*
 Science Focus: INF, LS2, SEP

David L. Brock (*brockda@rps.org*), Roland Park Country School, Baltimore, Md.

Hear how to create a summer research internship for increasing high school girls' interest in pursuing careers in science.

Developing Community College Students' Research Skills

(College) *Mockingbird 4, Omni*
 Science Focus: GEN, CCC2, SEP1, SEP3, SEP7, SEP8

Amy Naylor (*@DrANaylor*; *anaylor@mitchellcc.edu*), Mitchell Community College, Statesville, N.C.

Learning about scientific investigations involves more than defining hypotheses and variables. Engage students in developing experimental protocols, critiquing professional articles, and presenting their own research.

Bringing STEAM and Literacy to the Periodic Table

(Grades 6–10) *Music Row 1, Omni*
 Science Focus: PS, SEP2, SEP8

Lois Nyren (*nyren@ramaz.org*) and **Elizabeth Weissman** (*weissmane@ramaz.org*), The Ramaz School, New York, N.Y.

Discover how an elements project integrates technology, literacy, and arts into the study of atomic structure and the periodic table.

**RESCHEDULED TO
 FRIDAY, 2:00 PM
 (see program changes)**

Teacher Researcher Day Session: The Effects of Student Collaboration on Performance in a Grade 9 Biology Class

(Grades 7–12) *East Ballroom/Group 1, Renaissance*
 Science Focus: LS

Cynthia McMillen (*@cindymcbuf*; *cmcmillen@dunkirk.wnyric.org*), Dunkirk High School, Dunkirk, N.Y.

Jean Michielli-Pendl (*jean.michielli-pendl@fredonia.edu*), SUNY Fredonia, N.Y.

Join in a discussion about student collaboration structures and how they impacted achievement in a highly diverse grade 9 biology class.

Teacher Researcher Day Session: Student-Developed Assessment

(Grade 7) *East Ballroom/Group 2, Renaissance*
 Science Focus: GEN

Reginald Tyler, Albuquerque Institute for Mathematics and Science, Albuquerque, N.Mex.

Energize your students by having them design multi-modal performance assessments. Hear lessons learned and student feedback, as well as view samples of student-generated assessments and other data collected.

Teacher Researcher Day Session: How the Search for Bigfoot Can Teach Science and Engineering Practices

(Grades 6–College) *East Ballroom/Group 3, Renaissance*
 Science Focus: GEN, SEP

Cher Carlisle, Mount Juliet High School, Mount Juliet, Tenn.

Students struggle to learn science and engineering practices. Turn your students into Sasquatch hunters. Hear how to use the search for Bigfoot as an open-ended inquiry with accountable talk practices to teach these practices.

1:00–2:30 PM Exhibitor Workshop**Getting to Know the Creative Coding Through Games and Apps (CCGA) Course Content**

(Grades 7–10) *110A, Music City Center*
 Science Focus: GEN

Sponsor: Microsoft

Todd Beard (*v-tobear@microsoft.com*), Microsoft Innovative Educator Fellow, Detroit, Mich.

This session is an overview of a first-semester course to introduce programming in early secondary grades in a manner that will excite and engage students, no prior experience required! Come gain an understanding of the course through hands-on experience with the curriculum.

1:15–1:45 PM Presentations

Meet Me in the Middle Session: Earworms and Melodies: Teaching Science Through Songs

(Grades 4–10) *Broadway A, Omni*
Science Focus: ESS, LS, PS

Donna Governor (dgovernor@windstream.net), NSTA Director, District V, and North Forsyth High School, Cumming, Ga.

Orchestrate new learning with content-rich science songs that engage students through novelty while building conceptual knowledge and activating multiple neural pathways for understanding.

Meet Me in the Middle Session: Science Formative Assessment: What Do Middle School Students Really Think?

(Grades 6–8) *Broadway B, Omni*
Science Focus: GEN

Joyce Tugel (jtugel@gmail.com), Maine Mathematics and Science Alliance, Augusta

Find out how a variety of formative assessment techniques can be used to promote intellectual engagement and uncover middle school students' ideas and ways of reasoning.

Meet Me in the Middle Session: Engaging Students in Science with Interactive Notebooks and Nature Journaling

(Grades 7–8) *Broadway C, Omni*
Science Focus: GEN

Nealyn Dunlop, Roosevelt Middle School, New Bedford, Mass.

Come learn how to use interactive notebooks and nature journaling as a means of engaging middle school students in science and increasing scientific writing. Samples will be provided and participants will practice these methods of journaling in an interactive environment.

Meet Me in the Middle Session: Using 5Es to Engage Middle Schoolers

(Grades 6–8) *Broadway D, Omni*
Science Focus: GEN

Vicki Massey (vickimassey@cox.net), Higley Unified School District #60, Gilbert, Ariz.

Learn how using the 5E (Engage, Explore, Explain, Elaborate, and Evaluate) model of instruction engages middle-schoolers in science while developing critical-thinking skills. This session will reinforce cooperative learning strategies.

1:30–2:30 PM Exhibitor Workshop

Climate Change Series IV: NOAA Climate Stewards

(Grades K–12) *201A, Music City Center*
Science Focus: ESS3

Sponsor: NOAA Ocean Service

Molly Harrison (molly.harrison@noaa.gov), **Peg Steffen** (peg.steffen@noaa.gov), and **Bruce Moravchik** (bruce.moravchik@noaa.gov), NOAA National Ocean Service, Silver Spring, Md.

Bringing climate science into education settings can be challenging. Come learn from educators in NOAA's Climate Stewards who will showcase strategies, activities, and resources to use with your audiences. Information about NOAA Climate Stewards Education Program will also be presented.

2:00–2:30 PM Presentations

History Should Be Repeated in the Science Classroom

(Grades 6–12) *Acoustic, Omni*
Science Focus: GEN, SEP1, SEP6, SEP8

William Bowman (wbowman@pkwy.k12.mo.us), Parkway North High School, Saint Louis, Mo.

Monica Bowman (@MBowmanScience; mbowman@ladueschools.net), Ladue Horton Watkins High School, Saint Louis, Mo.

Intertwining history and science makes students better appreciate how historical events impacted the development of science and how science causes historical changes.

INF Get the Maker Party Started

(Grades K–12) *Cumberland 2, Omni*
Science Focus: INF

Gina Tesoriero (@stemssuccessedu; ginatoriero@gmail.com) and **Amanda Solarsh** (amandasolarsh@gmail.com), Simon Baruch MS104, New York, N.Y.

Encourage creativity and engagement in STEM fields by throwing a Maker Party at your school, inspiring both community involvement and student leadership.

Using STEM Interactives in the Classroom to Connect Learning to Real-World Applications

(Grades 6–12)

Cumberland 3, Omni

Science Focus: GEN

Tracie Mastronicola (@tracie_mastro; tracie.mastronicola@ck12.org), CK–12 Foundation, Palo Alto, Calif.

Learn how to integrate science interactives into your classroom and lab. These interactives can help you to connect science concepts to real-world examples.

Recruiting STEM Talent and Designing Pathways for STEM Teaching

(College)

Music Row 3, Omni

Science Focus: GEN

Heather J. Johnson (heather.j.johnson@vanderbilt.edu) and **Jennifer Ufnar** (jufnar@gmail.com), Vanderbilt University's Peabody College, Nashville, Tenn.

Discussion centers on recruitment efforts to attract STEM talent into teaching and the construction of supportive licensure pathways to improve STEM teaching in urban schools.

Teacher Researcher Day Session: Multimedia Portfolios as Assessment

(General)

East Ballroom/Group 2, Renaissance

Science Focus: GEN, NGSS

Deborah Roberts-Harris (drober02@unm.edu), The University of New Mexico, Albuquerque

Join me as I share student multimedia portfolios prepared as a final assessment for my science methods course.



2:00–3:00 PM NSTA/ASE Honors Lecture

The Learning Journey

(General)

103B, Music City Center

Science Focus: GEN



Corinne Stevenson, Chairperson, The Association for Science Education, Hatfield, Herts., United Kingdom

President: Shaun Reason, Chief Executive, The Association for Science Education, Hatfield, Herts., United Kingdom

A clear professional pathway for science teachers supports high-quality teaching and good outcomes for young people. Such a pathway places responsibility for progression with teachers by enabling them to benchmark their skills and expertise, identify what they need to progress, and select appropriate professional development to take them forward in their professional journey. There is an expectation that schools will support teachers in their journeys and enable them to access appropriate professional development. Join Corinne, current chair of the Association for Science Education in the U.K., as she shares how ASE is supporting the development of this journey and linking it to its professional registers.

Corinne Stevenson is currently chair of the Association for Science Education in the U.K. as well as a school improvement consultant. She started her teaching career as a secondary teacher in the London Borough of Hounslow. She eventually became head of School Improvement, responsible for achievement in all schools in the Local Authority. She has also held posts as Ofsted inspector, chair of the Chartered Science Teacher Awarding Board, and previous chair and current secretary of NAIGS (National Advisers and Inspectors Group for Science).

2:00–3:00 PM Arthur C. Clarke Institute for Space Education Lecture
Thoughts on Science Education, Science, and Personal Beliefs

(General) Grand Ballroom C2, Music City Center
Science Focus: GEN

Sponsored by Arthur C. Clarke Institute for Space Education



Jeff Goldstein (@doctorjeff; jeffgoldstein@ncesse.org), Institute Director, Arthur C. Clarke Institute for Space Education, Ellicott City, Md.

President: Fred Myers, APAST President, Bolivia, N.C.

Discussion centers on the vital role in the science and STEM classroom of inquiry- and evidence-based conceptual understanding at an emotional level, and its connections to both science and one's personal beliefs. It is a pedagogy grounded in what it means to be human, and embracing the notion that science and personal beliefs need not be in conflict. Jeff's goal is a truly thought-provoking experience for all teachers of science and STEM.

Dr. Jeff Goldstein is director of the National Center for Earth and Space Science Education (NCESSE). He is responsible for overseeing the creation and delivery of national science education initiatives with a focus on Earth and space. These include programs for schools, families, and the public; professional development for grades K–12 educators; and exhibitions for museums and science centers. Initiatives are meant to provide a window on the nature of science and the lives of modern-day explorers. Programs are designed to “inspire... then educate.”

As NCESSE director, Dr. Goldstein creates and directs several programs including Student Spaceflight Experiments Program (SSEP), which immerses grades 5–16 students, in 123 communities across the U.S. and Canada, in real microgravity experiment design with one experiment selected from each community to launch to the International Space Station and be operated by an astronaut. He also plays a key role in The Voyage National Program, a permanent installation of the Voyage model Solar System on the National Mall in Washington, D.C. In 2016, the Voyage Mark II exhibition will be available for permanent installation at 100+ sites across the U.S. and worldwide. He also serves as director for The MESSENGER Educator Fellowship Program, supporting NASA's MESSENGER spacecraft mission to Mercury, provided training for 24,000 K–12 teachers on solar system science through a corps of master science educators, as well as The Family Science Night program at the Smithsonian National Air and Space Museum.

2:00–3:00 PM Presentations



NSTA Press® Session: Five E(z), “Elementary” Steps To Next Generation Science Teaching

(Grades K–5) 101D, Music City Center
Science Focus: GEN, CCC1, CCC3, CCC4, SEP1

William Banko (info@surgical.com), Knowing Science LLC, Armonk, N.Y.

Thomas O'Brien (tobrien@binghamton.edu), Binghamton University, Binghamton, N.Y.

Experience an engaging 5E (Engage, Explore, Explain, Elaborate, and Evaluate) cycle (metric measurement, models, and moon matters) that also explores the analogy between the NGSS with the work of scientists and K–5 teachers.

Don't Open That Textbook Yet, You've Got a Story to Share!

(Grades 1–6) 104E, Music City Center
Science Focus: GEN

Adam Devitt (ard386@nyu.edu), New York University, New York, N.Y.

Where and how do you do science? Recognizing and valuing science in our own lives so we can foster meaningful connections to students' lives.

Investigating the New Madrid Seismic Zone: New Science from Earthscope and Illustrative Physical Models for the Classroom

(Grades 6–College) 105A, Music City Center
Science Focus: ESS2.B, CCC2, SEP6

John Taber (taber@iris.edu), IRIS, Washington, D.C.

Get the latest science on the New Madrid seismic zone and how to investigate the processes causing plate boundary and intraplate quakes with students.

GeoTeach: Engaging Middle School Students in Inquiry and Engineering-Based Earth Science

(Grades 6–8) 106A, Music City Center
Science Focus: ESS, ETS1

Katie Busch (kabusch@uab.edu) and **Danielle Yancey** (dmyancey@uab.edu), The University of Alabama at Birmingham

We will share innovating and engaging activities that help students and teachers get excited about middle school Earth science. Includes inquiry, engineering, and literacy.

Get Your Hands On Science



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NSTA National
Science
Teachers
Association

Inside the Science Teacher's Studio

(General)

Broadway B, Omni

Science Focus: GEN, NGSS

Linda Jordan (jordan.linda1212@gmail.com), Council of State Science Supervisors, Nashville, Tenn.

Jennifer Dye (@jendye71_dye; jennifer.dye@jp2hs.org), Pope John Paul II High School, Hendersonville, Tenn.

Margie Hawkins (@margiebg; margiebg@gmail.com), Program Coordinator, NSTA Nashville National Conference, and Winfree Bryant Middle School, Lebanon, Tenn. Learn how the TSTA, Oakley STEM Center, and Building Capacity for TN Science Education network have partnered to facilitate a smooth transition into the new Tennessee Science Curriculum Framework way of teaching and learning, with online webcasts and on-site pop-up conferences.

App and at 'em: Using Technology in Professional Development

(Grades K–12)

Broadway G, Omni

Science Focus: ETS2

Lisa Bohn (@lisa_bohn; lbohn@astate.edu), Arkansas State University, Jonesboro

Elizabeth Allan (eallan@uco.edu), University of Central Oklahoma, Edmond

Pat Shane (pshane@unc.edu), 2009–2010 NSTA President, and Educational Consultant, Chapel Hill, N.C.

Join us as we demonstrate free apps that can be used to enhance the essential elements of successful professional development: preplanning, implementation, and evaluation.

EXENTHUNCO

(Grades 6–8)

Broadway H, Omni

Science Focus: LS4.B

Frederick Maier (fredmaier@sbcglobal.net), Village of Itasca Nature Center, Itasca, Ill.

Species populations change over time. Take students on a 100-year journey with this program where some species thrive, and some go extinct.

Building Effective STEM Partnerships on a Limited Budget

(Grades K–12)

Cumberland 1, Omni

Science Focus: GEN, NGSS

Sandra Jenoure (jenoure@aol.com), Hunter College, New York, N.Y.

Adaliz Gonzalez (@adalizg310; adaliz@rocketmail.com), New York City (N.Y.) Dept. of Education

Roy Harris (rharris@thecei-pea.org; rharris2@schools.nyc.gov), CEI-PEA, Whitestone, N.Y.

Join a team of educators and administrators as they share

their experiences creating a culture of collaboration and trust in a network of K–12 schools. Learn how they are able to meet regularly, share best teaching practices, share STEM lesson planning focused on the CCSS, and develop online resources. All resources will be available for the participants.

Freshwater Stewardship: Equip Your Student-Scientists with Cutting-Edge Resources from NOAA

(Grades 4–12)

Cumberland 4, Omni

Science Focus: ESS

June Teisan (@jlteisan; june.teisan@noaa.gov), NOAA Office of Education, Washington, D.C.

Dennis Cain (dennis.cain@noaa.gov), NOAA National Weather Service, Fort Worth, Tex.

Flooding. Water Pollution. Freshwater is the lifeblood of our planet, and our future depends on the next generation of environmental stewards to preserve the health of watersheds. NOAA and the National Weather Service have a wealth of online lesson plans, videos, data sets, webinars, and more to help inform and inspire students to action in research, stewardship, and resource management for vital freshwater ecosystems.

Problem-Based Learning: A Partnership Using NGSS and CCSS

(Grades 3–College)

Cumberland 5, Omni

Science Focus: GEN, NGSS

Barney Peterson (bpeterson@everettsd.org), Monroe Elementary School, Everett, Wash.

Gary Popiolkowski (garypoprr33@gmail.com), Chartiers-Houston Junior/Senior High School, Houston, Pa.

Learn how to use Problem-Based Learning to promote authentic research and problem-solving opportunities for all students. Join us to share ideas, techniques, online resources, and experiences.

Enhancing Science Understanding Through Conceptual Change Lessons

(Grades K–6, College)

Electric, Omni

Science Focus: GEN, NGSS

Susan Cooper (sjcooper@fgcu.edu), Florida Gulf Coast University, Fort Myers

Lee Hughes (leoph@leeschools.net), Lee County Public Education Center, Fort Myers, Fla.

Examine K–6 lessons and activities focused on conceptual change that help elementary education majors develop scientific literacy and understand the nature of scientific knowledge.

Using Machine Learning to Measure Learning Progressions and Inform Instruction

(Grades 7–12) *Music Row 2, Omni*
Science Focus: ESS, LS, CCC, SEP

Jay Thomas, Stephanie Stratton, and Brian Hamilton (brian.hamilton@act.org), and ACT, Inc., Iowa City, Iowa
See how machine learning algorithms can provide insights from student answers that inform instruction. ACT has partnered with Michigan State’s CarbonTIME project to find out.

Equity in the Science Classroom

(Grades K–12) *Music Row 5, Omni*
Science Focus: GEN, NGSS

Thomas Reinhardt (reinhardt.biology@gmail.com) and **Sonnie-Dae Ross** (sonnie.dae@ousd.k12.ca.us), Oakland (Calif.) Unified School District
How is “equitable teaching” the same and different from “good science teaching?” Together, we will examine science teaching and learning through a lens of equity.

Design Thinking: A Creative Engineering Approach to Problem Solving

(Grades 5–College) *Fisk Two, Renaissance*
Science Focus: ETS1, ETS2.B, CCC4, SEP1, SEP2, SEP4, SEP6

Ruth Leonard (@CHEM2T; ruth.leonard@sullivank12.net), Sullivan County Schools, Blountville, Tenn.
Engage in five-step process Design Thinking. This process can be used with students or coworkers in striving to creatively solve problems.

The Magic of Science! Motivate Your Science Students Using “Discrepant Events”

(Grades 4–12) *Music City Ballroom, Renaissance*
Science Focus: GEN

Dwight “Buzz” Putnam, Whitesboro High School, Marcy, N.Y.
This session introduces thought-provoking, paradoxical discrepant demonstrations for all science subjects, performed with music and humor, guaranteed to energize your most apathetic science students!

2:00–3:00 PM Hands-On Workshop

Holy Moly Roly Poly!

(Grades K–3) *101 A/B, Music City Center*
Science Focus: LS1.A, LS1.B, CCC, SEP

Teresa Higgins (teresa.higgins@unco.edu), University of Northern Colorado, Greeley
School yard organisms provide an easy connection for exploring the outdoors with young learners. Pill bugs are the target of great interest by many kids and there is a lot kids can learn! Come explore the fascinating world of the pill bug with engaging experience and ideas to share with your learners.



Designing Animals to Survive Cold Temperatures

(Grades 4–8) *101E, Music City Center*
Science Focus: PS3.B

Patricia Paulson (@Pattipaulson1; patricia-paulson@bethel.edu), Bethel University, Saint Paul, Minn.
Design Water Bottle Animals to explore energy conservation and transfer. Data will be collected to engage in scientific argumentation, defending the claims with evidence.

Integrating STEM into the Entire Elementary Curriculum

(Grades 2–5) *104C, Music City Center*
Science Focus: GEN

Mandy Colwell (mandy.colwell@gscs.org), Crescent Road Elementary School, Griffin, Ga.
Discover exciting ways to implement STEM into reading, writing, and social studies, as well as science and mathematics! Learn how LEGO® bricks can inspire and engage students in STEM implementation. Take home the design process, lesson plan template, and lesson plans ready for use in the classroom.

STEM: Not Just Another Thing...

(Grades K–5) *104D, Music City Center*
Science Focus: ETS

Michele Wiehagen (michele.wiehagen@sdhc.k12.fl.us) and **Shana Tirado** (shana.tirado@sdhc.k12.fl.us), Hillsborough County Public Schools, Tampa, Fla.
This session will provide K–5 teachers with an hands-on approach to the creation of integrative STEM lessons. Receive lessons samples.

Engaging Chemistry Students Through Forensics Investigations

(Grades 10–12) *105B, Music City Center*
Science Focus: PS

Tonya Patterson (*tpatterson@alvinisd.net*), Alvin High School, Alvin, Tex.

Presider: Stephanie Hopkins, Alvin High School, Alvin, Tex. We will share ways to increase students' interest in chemistry by converting traditional lab investigations and activities into an exciting forensic problem-solving opportunity. Engage in hands-on activities using extensive and intensive properties, solubility, intermolecular forces, and explore a different approach to the flame test to support forensic investigation.

Participating in the Global Decomposition Project and Using the IMOLD Interactive Model of Leaf Decomposition

(Grades 6–12) *106B, Music City Center*
Science Focus: LS

Susan Steiner (*ssteiner76@hotmail.com*), Murphy High School, Murphy, N.C.

Get hands-on learning using the Global Decomposition Project, and learn to use the virtual model of leaf decomposition: IMOLD.

This Efficient House

(Grades 6–8) *106C, Music City Center*
Science Focus: ETS1, CCC2, CCC3, CCC5, SEP

Patricia Hillyer (*@iHillyer*; *pjhillyer@gmail.com*), Matawan-Aberdeen Middle School, Cliffwood, N.J.

Design your idea of an energy-efficient home. Learn how to use an interdisciplinary unit of Project-Based Learning incorporating the NGSS and CCSS using real research and materials from home.

National Earth Science Teachers Association (NESTA) Shares: Atmosphere and Ocean Share-a-Thon

(General) *Davidson B, Music City Center*
Science Focus: ESS

Michael Passow (*michael@earth2class.org*), Dwight Morrow High School, Englewood, N.J.

Carla McAuliffe (*carla_mcauliffe@terc.edu*), TERC, Cambridge, Mass.

Join more than 20 NESTA members and other educators as they share their favorite weather, climate, and ocean classroom activities. Many free handouts!

Capturing Engineering Design and Process in Youth Portfolios

(Grades 4–College) *Legends B, Omni*
Science Focus: ETS1, CCC, SEP

Stephanie Chang (*@heyasteph*; *stephanie@makered.org*) and **Lisa Regalla** (*@Regallium*), Maker Education Initiative, Emeryville, Calif.

Curious about facilitating the creation of open youth portfolios? Join us for a hands-on workshop that focuses on the capture and documentation of engineering design processes by students.

INF Nano Days and Nights

(General) *Legends C, Omni*
Science Focus: ESS2.A, INF, CCC3, CCC6, SEP2, SEP3, SEP4

Lynne Hehr (*lhehr@uark.edu*) and **John Hehr**, University of Arkansas, Fayetteville

Want a way to tie today's research-of-the-future to formal and informal science education? Explore fun, hands-on nanotechnology stations and leave with loads of ideas/resources.

Critical Perspectives on Using News Media in the Science Classroom

(Grades 7–12) *Legends E, Omni*
Science Focus: GEN

Michael Bowen (*gmbowen@yahoo.com*), NSTA Director, District XVIII, and Mount Saint Vincent University, Halifax, N.S., Canada

Tony Bartley, Lakehead University, Thunder Bay, Ont., Canada

Discussion centers on problematic issues with using news media in science classrooms to teach science and then engage in example activities that address these issues.

Science at the Dollar Store

(Grades 3–College) *Center Ballroom, Renaissance*
Science Focus: GEN

Nancy Foote (*@mrsfoote*; *tinkerbell0611@gmail.com*), Sossaman Middle School, Queen Creek, Ariz.

View demos of lots of hands-on standards-based science labs that you can do with your students with materials from the dollar store! Stop spending so much money! Find out how to get stuff for free!

2:00–3:30 PM Presentation

Multicultural/Equity Share-a-Thon

(General) Davidson C, Music City Center

Science Focus: GEN, NGSS

Jerry Valadez (*jdvsience@yahoo.com*), NSTA Director, Multicultural/Equity, and California State University, Fresno

Paul Adams (*padams@fhsu.edu*), NSTA Director, District XI, and Fort Hays State University, Hays, Kans.

Deena Gould (*deena.gould@asu.edu*), Arizona State University, Tempe

S. Maxwell Hines (*hinessm@wssu.edu*), Winston-Salem State University, Winston-Salem, N.C.

Sami Kahn (*samikahn@mail.usf.edu*), Collegiate School, New York, N.Y.

Brittnee Laurence (*b.laurence@vikes.csuohio.edu*) and **Brianna Scimone** (*bscimone13@gmail.com*), Cleveland State University, Cleveland, Ohio

Gary Nakagiri (*gnakagiri@gmail.com*), Alameda County Office of Education, El Cerrito, Calif.

Vanessa Sherman (*vanessa.sherman@cgelem.k12.az.us*), Cactus Middle School, Casa Grande, N.Mex.

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2:00–3:30 PM Exhibitor Workshops

Wind Turbines and Fruit Batteries! Constructing Engaging Engineering Experiences Using NGSS Performance Expectations

(Grades 3–5)

202B, Music City Center

Science Focus: ETS, CCC, SEP

Sponsor: Houghton Mifflin Harcourt

Michael DiSpezio, Author and STEM Specialist, North Falmouth, Mass.

Here's your chance to learn the basic teaching tenets of engineering as prescribed by grades 3–5 performance expectations. Learn and have fun as you participate in grade-appropriate activities that profile the NGSS approach to engineering and use inexpensive and easy-to-obtain materials.

Elementary Science Activity Jamboree

(Grades 1–6)

207A, Music City Center

Science Focus: ESS, LS, PS

Sponsor: Ward's Science

Patty Muscatello, VWR Science Education, Rochester, N.Y.

Come on down and join us for good ol' fashion integrated science lessons, y'all! Learn how to integrate NGSS science concepts across your elementary curriculum and get your kiddos fired up about science. We will highlight at least one NGSS-focused activity from life, Earth, and physical science disciplinary core ideas. Meet fellow teachers, share new ideas, learn tips and techniques, and more.



Human Physiology with Vernier

(Grades 9–College)

207C, Music City Center

Science Focus: LS, SEP

Sponsor: Vernier Software & Technology

John Melville (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.

Use Vernier sensors to conduct a variety of human physiology experiments from our popular *Human Physiology with Vernier* lab book in this engaging hands-on workshop. Experience data collection using LabQuest 2, Logger Pro computer software, and mobile devices.

Introductory Engineering Design Projects with Vernier

(Grades 6–12)

207D, Music City Center

Science Focus: ETS1, SEP

Sponsor: Vernier Software & Technology

Dave Vernier (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.

This engaging hands-on workshop explores ways to use Vernier sensors for introductory engineering design projects. Using our Digital Control Unit and Logger Pro computer software, participants will learn how to apply logic statements to set alarms and to control simple electronic devices based on sensor input values.

ECO Classroom: Free Experiential Learning in the Rain Forests of Costa Rica

(Grades 7–12)

208B, Music City Center

Science Focus: LS2.A, LS2.C, LS4.D, SEP1, SEP3, SEP4, SEP5, SEP8

Sponsor: Northrop Grumman Foundation

Ryan Cilsick, Edgewood Junior High School, Merritt Island, Fla.

Samuel Wheeler, Einstein Fellow, U.S. Dept. of Energy, Durham, N.C.

Peggy Lubchenco, K–12 Science Professional Development Consultant and Science Specialist, Goleta, Calif.

James MacCarthy, Conservation International, Arlington, Va.

Past ECO Classroom teachers will share their experiences from participating in a free professional development program that offers middle school and high school science teachers the opportunity to study rain forests in Costa Rica. Information about the next trip will also be presented.

Make Science Come to Life

(Grades 1–5)

211, Music City Center

Science Focus: GEN, NGSS

Sponsor: LEGO Education

Laura Jackson, Anderson (S.C.) School District Five

Did you know LEGO® bricks can provide an engaging platform for making science come to life? Using LEGO Education solutions, elementary students can explore, create, and share discoveries as they build solutions to real-world, standards-based projects and deeply engage with science practices and the engineering design process. Come experience a resource that develops students' confidence to ask questions, find answers, and solve problems by putting discovery in their hands.

2:00–4:00 PM Meeting

NSTA Council Round Table

(By Invitation Only)

Legends A, Omni

2:00–4:00 PM Presentations

INF Science in the Community Session: Forum on Family Science Learning

(General)

104A, Music City Center

Science Focus: INF, CCC1, CCC2

Kelly Riedinger (kriedinger@davidheil.com), David Heil & Associates, Inc., Portland, Ore.

Marc Wunder (marc.wunder@aps.edu) and **Stefanie McDermott** (stefanie.mcdermott@aps.edu). Albuquerque (N.Mex.) Public Schools

Allison Brody (abrody@explora.us), Explora, Albuquerque, N.Mex.

Join practitioners and researchers as they share insights from research on family science learning as well as exemplary partnerships and programs that seek to provide families with opportunities to learn science.



Check out these dependable, easy-to-use and affordable timers at booth 741



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Meet Me in the Middle Session: Middle Level Share-a-Thon

(Grades 5–9)

Broadway E/F, Omni

Science Focus: GEN

Organizer: **Todd Hoover** (@DrToddHoover; *thoove2@bloomu.edu*), Bloomsburg University of Pennsylvania, Bloomsburg

Visit bit.ly/1T37EXd for a complete list of participants.

Calling all middle school science teachers! Join more than 100 presenters to obtain numerous lesson plans and activities for use in your classroom tomorrow!

2:00–4:00 PM Hands-On Workshop

Alliance of Affiliates Session: The 3Rs: Research, Resources, and Relationships

(General)

Broadway K, Omni

Science Focus: GEN

Juan-Carlos Aguilar (*jaquilar@doe.k12.ga.us*), Georgia Dept. of Education, Atlanta

Lisa Martin-Hansen (@LMHROCKS; *l.martinhansen@csulb.edu*), ASTE President, and California State University, Long Beach

Deborah Hanuscin, (*hanuscind@missouri.edu*), University of Missouri, Columbia

Come connect with NSTA affiliates to learn about research and resources and form relationships to support your work in science education.

2:30–3:00 PM Presentations

Culturally Relevant Teaching Practices in Science Classrooms

(Grades 6–12)

Acoustic, Omni

Science Focus: GEN

Katherine Wade (*katieswade@gmail.com*) and **Suzanna Roman** (*suzannaroman@hotmail.com*), Georgia State University, Atlanta

Melissa Schoene, Georgia Perimeter College, Decatur
This session is geared toward grades 6–12 science teachers who are interested in using culturally relevant pedagogy as a framework for their curriculum.

The Future of School

(General)

Cumberland 2, Omni

Science Focus: GEN

Robert Shaw, Mary Institute and Saint Louis Country Day School, Saint Louis, Mo.

Thinking of building a new science/STEM classroom? Learn how to make the building part of the classroom, leverage open space for environmental projects, and launch innovative programs with a greenhouse, research lab, and robotics lab. Renovate or build from scratch to create STEM spaces that will meet the needs of every learner.

Putting the TECH into TEaCHing

(Grades 7–12)

Cumberland 3, Omni

Science Focus: GEN

Julie Heintz (@julieheintz; *jheints@tfd215.org*) and **Susan Lessner** (*slenner@tfd215.org*), Thornton Fractional North High School, Calumet City, Ill.

Integrating technology can be intimidating. Come witness easy ways to integrate technology into a science classroom, with stories of success and failure!

How to Create an Engaging and Successful Online Science Classroom

(College)

Music Row 3, Omni

Science Focus: GEN

Andrea Bierema (*abierema@msu.edu*), Michigan State University, East Lansing

Discussion centers on how to create an effective online science course from an instructor who is an adjunct faculty member at multiple online institutions.

Teacher Researcher Day Session: Using Scientific Literacy as a Reflective Practitioner

(General) *East Ballroom/Group 1, Renaissance*
Science Focus: GEN

Jeremy Ervin (@drjervin; jervin@cedarville.edu), Cedarville University, Cedarville, Ohio

Attention will be paid to effective inquiry-based reflection strategies to make sense of science teaching practices and student learning.

Teacher Researcher Day Session: Learning About Motion Is MESSY

(General) *East Ballroom/Group 2, Renaissance*
Science Focus: GEN, SEP

Deborah Roberts-Harris (drober02@unm.edu), The University of New Mexico, Albuquerque

MESSY stands for Movement, Engagement, Social Interactions, Spontaneity, Yikes and Yippees. University faculty,

teachers, and students participated in a MESSY learning adventure. Integrating STEM areas led students to new learning through the NGSS eight practices of science and engineering.

Teacher Researcher Day Session: The Effect of Scientific Research on High School Students

(Grades 6–College) *East Ballroom/Group 4, Renaissance*
Science Focus: GEN

Cher Carlisle, Mount Juliet High School, Mount Juliet, Tenn.

This Tennessee course offers scientific research as a laboratory science. Hear about the success of students taking the class at Mount Juliet High School in Wilson County.

2:45–3:45 PM Exhibitor Workshop**Climate Change Series V: Use NGSS as a Pathway to Climate Literacy**

(Grades 6–12) *201A, Music City Center*
Science Focus: ESS3

Sponsor: NOAA Ocean Service

Frank Niepold (frank.niepold@noaa.gov), NOAA Climate Program Office, Silver Spring, Md.

The NGSS are the first science standards to include human-caused climate change as a core idea for students. This session will provide examples of how and where climate concepts can be integrated with the NGSS, review climate relevant performance expectations, and discuss NOAA and partners efforts to identify NGSS-focused resources.

3:00–4:30 PM Exhibitor Workshop**The Differentiated Classroom in One Package: Teaching Science Inquiry to Modern Learners Using Microsoft Surface and Apps**

(Grades 7–12) *110A, Music City Center*
Science Focus: GEN

Sponsor: Microsoft

Helen Gooch (v-hegoc@microsoft.com), Microsoft Innovative Educator Fellow, Clarksville, Tenn.

This session will demonstrate examples of how students and teachers can use digital inking and Microsoft tools to differentiate learning in an inclusive science classroom. We will showcase how students are able to learn the five features of scientific inquiry and be engaged at a much deeper level.

3:00–6:00 PM Meeting**CESI Board Meeting**

(By Invitation Only) *Gibson Boardroom, Omni*

3:30–4:00 PM Presentation**Using Multi-Genre Writing to Infuse NGSS into the Science Classroom**

(Grades 7–College) *Fisk One, Renaissance*
Science Focus: GEN, SEP

Ann Haley Mackenzie (@annmackenzie; mackenh@miamioh.edu), Miami University, Oxford, Ohio

Discussion focuses on the use of multi-genre literacy projects and how they can be infused into the science classroom to support the NGSS.

3:30–4:30 PM Featured Presentation

Bundling the NGSS Performance Expectations

(General)

101D, Music City Center

Science Focus: GEN, NGSS



Peter McLaren (@PeterJMcLaren; pmclaren@achieve.org), Achieve, Inc., Washington, D.C.

Presider: David L. Evans, NSTA Executive Director, Arlington, Va.

“Bundling” is a term used to describe the process of grouping related NGSS performance expecta-

tions to build sequences of instruction to maximize learning for students. Join Peter as he shares the what, why, and how behind the bundling process to promote cohesive instruction to support students’ investigations of phenomena and solving problems.

Peter McLaren is currently director of State and District Support for Science at Achieve, Inc. Before joining Achieve, he was the science and technology specialist for the Rhode Island Department of Education (RIDE) where he supported districts in matters pertaining to standards and policy issues on K–12 science curriculum, instruction, and assessment as well as technology education. From 2010 to 2013, Peter served as president of the Council of State Science Supervisors (CSSS). In addition, he was a member of the National Academy of Science Committee for Developing Assessments of Science Proficiency in K–12 Education and the National Academy of Engineering Committee on Guiding Implementation of K–12 Engineering Education. He has also served as a member of the national writing committee for the Next Generation Science Standards.

Before joining RIDE in 2005, Peter was a science teacher for 13 years at both the high school and middle school levels. His recognitions include the Milken Family Foundation National Educator Award (2001) and the Rhode Island Science Teacher of the Year (1995) by the MIT-sponsored Network of Educators of Science and Technology. He holds a master’s degree in science education from the University of Rhode Island.

3:30–4:30 PM Presentation



From Cookbook to Open Inquiry: How to Develop the Necessary Skills

(Grades 9–12)

101E, Music City Center

Science Focus: GEN, SEP3

Borislaw Bilash, Pascack Valley High School, Hillsdale, N.J.

Students doing inquiry doesn’t just happen on its own. Learn how to help students develop the skills they need to design meaningful experiments that will provide convincing evidence.

Full STEAM Ahead

(Grades K–6)

104B, Music City Center

Science Focus: GEN, NGSS

Amanda Iocoangeli (iocoangeli@monroe.k12.mi.us), Monroe (Mich.) Public Schools

Lisa McLaughlin (mclaugh2@monroe.k12.mi.us), Custer Elementary School, Monroe, Mich.

Cheryl Bindus (bindus@monroe.k12.mi.us) and **Kyle Reed** (reedk@monroe.k12.mi.us), Waterloo Elementary School, Monroe, Mich.

Thinking about becoming a STEAM school? Come explore one elementary school’s journey—STEM vs. STEAM, LEGO® Robotics with coding, and curriculum redesign.

Climate Studies with Global Hawk and NASA Airborne Science

(Grades 6–12)

106A, Music City Center

Science Focus: ESS2.D, ESS3.D, LS2.B

Julie Bookman (jbookman@avhsd.org), Palmdale High School, Palmdale, Calif.

Use teacher-created lesson plans to collect climate and atmospheric data, and then compare it to the data collected by NASA scientists. Connect with NASA scientists during Airborne Science Missions.

Oh Say, Can You C-E-R?

(Grades 1–7)

Davidson A2/3, Music City Center

Science Focus: GEN, CCC2, SEP1, SEP6, SEP7, SEP8

Molly Murador-Cobb (@mollyp72; molly.murador@fwisd.org) and **Megan Clawson** (@meclawson; megan.clawson@fwisd.org), Fort Worth (Tex.) ISD

Help the young scientists in your classroom as they use evidence to construct scientific explanations. Join us for practical strategies to implement Claim-Evidence-Reasoning in all grade levels with varied scaffolding to meet the needs of all learners.

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2016 Schedule

April 20	Kites
May 11	Helicopters
May 25	Moon Rocks
June 15	Milestones of Flight: Lunar Module
September 14	Science on the Station
September 28	Star Trek 50th Anniversary
October 19	Hot Air Balloons
November 16	Landing on Other Planets
December 14	Wright Brothers



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Multi-Level Peer Tutoring Supports Student Success in High School Science

(Grades 9–12)

Acoustic, Omni

Science Focus: GEN, SEP

Shannon Morey (shannon.morey@gmail.com), East Boston High School, Boston, Mass.

Hear about an innovative peer tutoring program at an urban high school in which students in advanced science courses tutor peers in introductory courses.

Bring the Experts (Virtually) into Your Classroom

(Grades 6–12)

Broadway G, Omni

Science Focus: GEN

Jeffrey Lukens (jeffreylukens0613@gmail.com), Sioux Falls (S.Dak.) School District

Don't be at a loss when trying to answer the question: "When are we going to use this?" Let industry experts answer for you!

Weaving Literacy and Technology into the Middle School Science Classroom

(Grades 6–8)

Broadway H, Omni

Science Focus: GEN, SEP1, SEP6, SEP7, SEP8

Janet MacNeil (@curiouslearner8; janet_macneil@brookline.k12.ma.us), Public Schools of Brookline, Mass.

Learn how to integrate talk, writing, reading, and technology seamlessly into rich science learning experiences, assess students' understanding, and meet the NGSS and CCSS ELA.

Open and Guided Inquiry in Biology

(Grades 9–10)

Broadway J, Omni

Science Focus: LS, CCC1, CCC2

Maggy Witecki (maggywitecki@hotmail.com) and **Rick Stanley** (rick.stanley@mnp.org), Hume-Fogg Academic High School, Nashville, Tenn.

Experience one approach (presented by our students) and discuss what works for guided and open inquiry projects in biology. Take away rubrics and other helpful documents to get started!

Differentiating Content, Process, and Product: Examples from Earth History, Ecology, Force and Motion, and Astronomy Units

(Grades 6–12)

Cumberland 1, Omni

Science Focus: ESS1.B, ESS2.A, LS2.C, PS2.A, SEP

Susan Gran (sgran@lsc.k12.in.us), Lafayette (Ind.) School Corp.

Join in for sharing of a collection of activities for successfully encouraging students of all ability levels to engage with life, Earth, and physical science content and process.

But I Can't Do Science! Changing a Culture of Learned-Helplessness Through Standards-Based Grading

(Grades 7–12)

Cumberland 2, Omni

Science Focus: GEN, SEP

April West (april.west@graves.kyschools.us), Graves County High School, Mayfield, Ky.

Discover why we transitioned to standards-based grading with tips for secondary implementation and the impact it has had on students' perceptions about their ability to be successful in science.

Mastery Learning That Provides Choice and Changes Perception

(Grades 8–12)

Cumberland 3, Omni

Science Focus: PS1, PS2.B, PS2.C, CCC1, CCC3, CCC4, SEP4, SEP5, SEP6, SEP8

Erica Peddi (@elpeddi; erica.peddi@cobbk12.org; elpeddi@gmail.com), Campbell High School, Smyrna, Ga.

Find out how to use mastery learning cycles and how one school changed perception of a "hard" course and increased pass rates by differentiating.

Using Models to Teach How Blood Spatter Tells a Story!

(Grades 9–College)

Cumberland 4, Omni

Science Focus: GEN

Anthony Bertino (abertino@nycap.rr.com) and **Patricia Nolan Bertino** (nolanp@nycap.rr.com), Retired Educators, Schenectady, N.Y.

Using easy-to-understand inexpensive models, participants determine the direction of blood and area of convergence and origin. Is the blood evidence consistent with eyewitness accounts? Handouts!

From Love Canal to Phytoremediation: What's New in Environmental Engineering?

(Grades 9–12)

Cumberland 5, Omni

Science Focus: ETS, SEP

Michelle Griffin-Wenzel (@MGriffinwenzel; mtwenzel@att.net), Germantown (Wis.) School District

Explore how research and inquiry-based activities are used to educate students about Superfund sites and the use of phytoremediation as a cleanup method.

Are You a Co-Teacher? Rethinking Roles Through a Consult Model

(Grades 9–12)

Mockingbird 4, Omni

Science Focus: LS, SEP

Kathryn Eilert (@eyesience; kathryneilert@gmail.com) and **Sarah Klang** (sklang@mcpasd.k12.wi.us), Middleton High School, Middleton, Wis.

Imagine your co-teaching as a Venn diagram. Hear how the Consult Model can use teacher strengths and strategies to support all learners.

Becoming Teacher Leaders in a Turnaround School

(Grades 5–12)

Music Row 1, Omni

Science Focus: GEN

Sandra Sullivan (sullivans401@aol.com), Matthew J. Kuss Middle School, Fall River, Mass.

Join me to identify your leadership style, learn strategies to become a leader at your school, and stay sane through it all.

Three Steps to Greater Use of NGSS Practices and Stellar Student Research Projects

(Grades 6–12)

Music Row 2, Omni

Science Focus: GEN, NGSS

William Rigney (@Rigney18; wfrigney@gmail.com), Massachusetts State Science & Engineering Fair, Cambridge
Explore a three-step model in Massachusetts that is successfully helping teachers to increase use of NGSS science and engineering practices in their classrooms (grades 6–12).

How to Get Students to Open Their Textbooks and Look Forward to It

(Grades 8–10)

Music Row 3, Omni

Science Focus: GEN

John Clark (@johnedwclark; johnedw@cfl.rr.com), Deltona High School, Winter Springs, Fla.

Experience an ELA-focused lesson to improve literacy while you facilitate discovery of key science concepts within a chapter. Using a group-focused inquiry-based “Conference Learning” activity, you will have your students reading their textbooks and looking forward to doing it. Other ideas to raise literacy will also be shared.

SIRA: Science Instructional Reflection and Assessment: Creating a Curricular Road Map to NGSS

(Grades K–8)

Music Row 5, Omni

Science Focus: GEN, NGSS

Rosita Young (rosita.young@ousd.k12.ca.us), Oakland (Calif.) Unified School District

Interested in embedding the NGSS into existing curricula? Learn about a tool that accomplished this and infused CCSS ELA, relevancy, and higher-order thinking while assessing science learning.

A Visual Representation of Three-Dimensional Learning: A Model for Understanding and a Tool for Evaluating Curricula

(General)

Fisk Two, Renaissance

Science Focus: GEN, NGSS

Ana Houseal (ahouseal@uwyo.edu), University of Wyoming, Laramie

Become familiar with and use a new visual model to understand the power of 3-D learning, as well as identify and remedy gaps in existing curricula.

Interactive Notebooks in Middle School Science

(Grades 5–12)

Music City Ballroom, Renaissance

Science Focus: GEN, NGSS

Alicia Johal (@ALICIAJOHAL; aliciajohal@gmail.com) and **Marielle Venturino** (@msventurino; mari.venturino@gmail.com), Mar Vista Academy, San Diego, Calif.

See how middle school science teachers use interactive notebooks in science to improve critical-thinking skills and organization, and enhance literacy.

INF Science Beyond the Classroom

(Grades K–11)

West Ballroom, Renaissance

Science Focus: INF, NGSS

Jena Valdiviezo (jvaldiviezo@longbranch.k12.nj.us), Long Branch (N.J.) Public Schools

Hear about the development and implementation of an after-school student/parent program in which parents and students learn and work together to master the NGSS.

3:30–4:30 PM Hands-On Workshops



NSTA Press® Session: *Uncovering Student STEM-Connected Ideas in Science*

(Grades 3–College) 101C, Music City Center
Science Focus: GEN, NGSS

Page Keeley (@CTSKeeley; pagekeeley@gmail.com), 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla.

Joyce Tugel (jtugel@gmail.com), Maine Mathematics and Science Alliance, Augusta

Experience a variety of formative assessment probes and techniques designed to uncover students' thinking about the T, E, and M connections to science concepts and practices.

3D Motivating Modeling with Anchoring Phenomena and Challenge Questions

(Grades 7–12) 103A, Music City Center
Science Focus: GEN, SEP2

Cynthia Passmore (cpassmore@ucdavis.edu), **Candice Guy** (candiceguy@gmail.com), and **Chris Griesemer** (cdgriesemer@ucdavis.edu), University of California, Davis

Elizabeth Coleman (libcoleman@gmail.com), C.K. McClatchy High School, Sacramento, Calif.

Rich Hedman (hedmanrd@csus.edu), California State University, Sacramento

Come see how we link phenomena and questions with developing and using models. These strategies can help you with lessons to support NGSS implementation.

Connecting Scientists from the Past with Scientists in Our Classrooms: Linking Place-Based Science and Culture

(Grades P–8) 103B, Music City Center
Science Focus: ESS2, ESS3, CCC1, CCC2, CCC4, SEP1, SEP6, SEP8

Beverly Kutsunai (bekutsun@ksbe.edu), Kamehameha Elementary School, Honolulu, Hawaii

Come to this Yager scholar workshop to investigate how natural materials and traditional knowledge can provide an “old” perspective to enrich learners developing a new understanding of their world today.

Rhythm and Blues: Exploring the Science of Sound

(Grades 1–5) 104C, Music City Center
Science Focus: PS

Kristin Rearden (krearden@utk.edu) and **Amy Broemmel** (broemmel@utk.edu), The University of Tennessee, Knoxville
Orchestrate new learning in your classroom as you engage your grades 1–5 students with the concept of sound through

apps, poetry, and hands-on activities. We will create musical instruments with common materials to demonstrate the difference between pitch and volume.

Three-Dimensional Learning of Space Systems Across Elementary Grade Bands

(Grades P–5) 104D, Music City Center
Science Focus: ESS

Caryn Walker (caryn.walker@jefferson.kyschools.us), Jefferson County Public Schools, Louisville, Ky.

President: LeeAnn Nickerson, Jefferson County Public Schools, Louisville, Ky.

We will share lesson ideas that blend three-dimensional learning in units of instruction focused on patterns in space systems.

Building Plant Literacy with NGSS and CCSS

(Grades K–5) 104E, Music City Center
Science Focus: LS, SEP

Lloyd Barrow (barrowl@missouri.edu), University of Missouri, Columbia

President: Dannah (Dane) Schaffer (dannah.schaffer@minotstateu.edu), Minot State University, Minot, N.Dak.

Promote K–5 students' development of plant literacy by using science notebooks as they investigate seeds. Frequent student (and teacher) misconceptions will be addressed.

Butterfly Bonanza

(Grades P–11) 105A, Music City Center
Science Focus: LS, SEP

Nancy Sale (butterflybonanza@yahoo.com), Lillie C. Evans K–8 Center, Miami, Fla.

Butterfly Bonanza provides a road map to success for implementing a native butterfly habitat. Take home a starter kit that will enable you to immediately set up a habitat at your school. Door prizes and a DVD shared.

Using the Tools of the NGSS to Reach Girls in Science

(Grades 5–8) 105B, Music City Center
Science Focus: ETS, LS, PS, CCC, SEP

Sarah Carter (scarter@tpt.org) and **Rita Karl** (@SciGirls; rkarl@tpt.org), Twin Cities Public Television, St. Paul, Minn.

The NGSS were developed to make science accessible to all students. Discover how specific pedagogical strategies can be used with STEM activities to reach girls.

Keeping Things in Motion Using NASA and Newton's Laws

(Grades P–6) *106B, Music City Center*

Science Focus: ETS, PS

Linda Smith (*elementary.science.teacher@gmail.com*), Retired Educator, Elmer, N.J.

Use engineering challenges to allow your students to better understand the laws of motion.

National Earth Science Teachers Association (NESTA) Shares: Innovative Ways to Teach About Weather Observation and Weather Hazards

(Grades 4–College) *Davidson B, Music City Center*

Science Focus: ESS

Michael Passow (*michael@earth2class.org*), Dwight Morrow High School, Englewood, N.J.

Margaret Holzer (*mholzer@monmouth.com*), Chatham High School, Chatham, N.J.

NESTA members will share a variety of strategies to enhance your studies of weather and weather hazards to help implement NGSS and network your school.

Arts and Science: Spark Timers, Glue, and Scissors to Study Motion

(Grades 9–12) *Legends B, Omni*

Science Focus: PS2.A, SEP4

Meera Chandrasekhar (*meerac@missouri.edu*) and **Dorina Kosztin** (*kosztind@missouri.edu*), University of Missouri, Columbia

Spark timer tape will be cut and glued to produce position-time and velocity-time graphs of uniform and accelerated motion, and will be correlated to motion diagrams. Hand-outs!

Using Paper Airplane Design to Teach Scientific Investigations and the NGSS Engineering Practices

(Grades 5–10) *Legends C, Omni*

Science Focus: ETS, PS2.A, CCC6, SEP1, SEP3, SEP4, SEP6

Karen Bowers (*kbowers@guhds.net*), Monte Vista High School, Spring Valley, Calif.

Take learning to new heights as we explore two labs where students master scientific investigations and NGSS engineering practices through paper airplane design and flight.

Using Whiteboarding as a Strategy for Integrating ELA into Science

(General) *Legends E, Omni*

Science Focus: GEN, NGSS

Andrew West (*andrew.west2@colostate.edu*), Colorado State University, Fort Collins

Kelsey Sullivan (*kelsey.sullivan@russellville.kyschools.us*), R.E. Stevenson Elementary School, Russellville, Ky.

Come explore how dry erase boards can be used to integrate the ELA standards into lab-based hands-on science lessons.

Planning a Journey Toward the NGSS

(Grades K–12) *Legends F, Omni*

Science Focus: GEN, NGSS

Jennifer Gottlieb (*@jgottlieb2; jgottlieb@troy.k12.mi.us*), Troy (Mich.) School District

Sarah Coleman (*@mkgscience; scoleman@muskegonisd.org*), MAISD Regional Mathematics & Science Center, Muskegon, Mich.

Join us as we explore tools for developing and evaluating professional learning action plans that lead stakeholders toward NGSS implementation.

...and ACTION!

(Grades 6–12) *Legends G, Omni*

Science Focus: GEN, SEP2, SEP3, SEP8

Kristin Bundren (*@MrsBundren; kbundren@hoover.k12.al.us*), **Amber Lewis** (*alewis@hoover.k12.al.us*), and **Jeff Johnson** (*@phyteach1; jjohnson@hoover.k12.al.us*), Spain Park High School, Birmingham, Ala.

Enhance lessons, engage students, and incorporate Project-Based Learning with iMovie, stopmotionHD, screencastify, and more. Bring learning into action! BYOD, bring your own device.

Showing Student Growth of the NGSS: How Do You Know That Your Students Are Really Learning?

(Grades K–12) *Center Ballroom, Renaissance*

Science Focus: GEN, NGSS

Beth Byerssmall (*elizabeth.byerssmall@maine.edu*), The Maine Center for Research in STEM Education, University of Maine, Orono

Melissa Lewis (*melissa.lewis@rsu34.org*), J.A. Leonard Middle School, Old Town, Maine

Experience how K–12 teachers can use strategies of assessment for learning coupled with principles of sound design to accurately assess student growth using pre- and post-assessments aligned to the NGSS.

4:00–4:30 PM Presentation

Standardized Tests Put to Good Use

(Grades 5–12)

Fisk One, Renaissance

Science Focus: GEN

Kelsey Voller (@missvoller; kelsey.voller@gmail.com), Pacific Heights Academy, Sabin, Minn.

Learn how standardized exams, when used creatively, provide teachers with differentiated material, quality writing prompts, and manageable data...and they support inquiry lessons.

4:00–5:00 PM Exhibitor Workshop

Climate Change Series VI: Climate Games and Simulations

(Grades 6–12)

201A, Music City Center

Science Focus: ESS3

Sponsor: NOAA Ocean Service

Peg Steffen (peg.steffen@noaa.gov), NOAA National Ocean Service, Silver Spring, Md.

Climate change is making severe weather events harder to predict. Learn about climate games to develop decision-making skills with students. During this workshop, make decisions as the “mayor” of a vulnerable coastal city, prepare for climate change impacts, and follow a carbon atom as it travels around Earth.

4:00–5:30 PM Exhibitor Workshop

Physics of Music

(Grades K–8)

207A, Music City Center

Science Focus: PS

Sponsor: Ward’s Science

Samantha Bonelli, VWR Science Education, Rochester, N.Y.

Let’s explore the physics of music in Nashville, Music City! Students can learn how a trombone works, play in an orchestra, or explore the concept of resonance with the demonstrations and activities included in this kit. You’ll get plastic cups, labels, masonite boards, PVC pipes of various lengths, three music box movements, instructions, and song sheets. Students will learn how physics is everywhere, even in their favorite songs.

4:30–6:00 PM Networking Opportunity

Teacher Scientist Partnerships Reception

Broadway A, Omni

Teacher Scientist Partnership builds community and partnerships related to science education and welcomes people with diverse roles and expertise. Join us for this informational and organizational session. For additional information, please visit bit.ly/24e1tE4.

5:00–5:30 PM Presentations



Enhanced Exit Ticket: Round-Trip to Greater Student-Teacher Accountability

(Grades 6–College)

101E, Music City Center

Science Focus: GEN, SEP

Genevive Bjorn (@GeneviveBjorn; genevive@nasw.org), Eastlake High School, Chula Vista, Calif.

Enrique Romero (enriqueromeroj@gmail.com), University of California, San Diego, La Jolla

Effective science teachers model science practices, including gathering and analyzing student performance data. We will share an innovative teaching idea that boosts accountability using an enhanced exit ticket that allows teachers to gather and analyze real-time performance data from diverse groups of learners.

Integrating Science, Reading, and Writing with a Three-in-One Project

(Grades 3–6)

104B, Music City Center

Science Focus: GEN, SEP2, SEP8

Katie Logan (katiellogan@gmail.com), Edmondson Elementary School, Brentwood, Tenn.

Integrate science, reading, and writing through the use of a three-in-one project that can be used to meet virtually all of your science standards.

Using Video Technology to Analyze Motion in a Physics Classroom

(Grades 9–12)

Cumberland 1, Omni

Science Focus: PS2.A, CCC2, CCC4, SEP4, SEP5

Matthew Oney (oneymatt@gmail.com), Escanaba (Mich.) Area Public Schools

Angela Kolonich (@akolonich; gerberan@msu.edu), Michigan State University, East Lansing

Learn how to design/enact a unit on momentum that uses video technology to engage students in data analysis and mathematical computation.

Let’s Get Talkin’ About Science!

(Grades 9–12)

Music Row 1, Omni

Science Focus: GEN, SEP1, SEP6, SEP7, SEP8

Brittany Klimowicz (brittany.klimowicz@uasdc.org), Urban Assembly School of Design and Construction, New York, N.Y.

Student-led discussions are some of the best ways for students to engage in their learning. Find protocols for facilitating student discussion.

Powering Our Students’ Futures

(Grades 5–10)

West Ballroom, Renaissance

Science Focus: GEN, SEP2, SEP3, SEP4, SEP5, SEP6, SEP7, SEP8

Megan Heng (heng5321@yahoo.com), **Kelly Schmidt** (kschmidt@min201.org), and **Rachel Klode**, Minooka Junior High School, Minooka, Ill.

Hear how a major energy corporation and local schools can team up to build student interest in science and mathematics.

5:00–6:00 PM Meeting

NESTA Annual Membership Meeting

Davidson B, Music City Center

Find out what NESTA has been up to. Share your thoughts on directions for NESTA, and help plan for the future. For additional information, please visit www.nestanet.org.

BOOT SCOOTIN’ BOOGIE!

Saturday, April 2, 8:00–10:00 PM, at the Frontier Room

Frontier Room (located above the Whiskey Bent Saloon)
306 Broadway, Nashville, TN 37201 • 615-401-2580

*The Frontier Room of the Whiskey Bent Saloon has a separate entrance, which is located around the corner on 3rd Avenue and up the stairs behind the Saloon.

Open to y’all!

Git yerself over to the **Frontier Room** (directions at left) for an opportunity to network and meet up with your colleagues on the last night of the NSTA conference.

This evening of entertainment will feature...

- **Charity Byars, performing artist and band** as well as line dance lessons and traditional bar foods for sale, including pulled pork sandwiches, sliders, tater tots, etc. (ranging from \$5 to \$15).

*Cash bar with the “*Boot Scootin’ Bourbon*” drink special!

5:00–6:00 PM Presentations

Space Station Explorers

(Grades 6–12) *103B, Music City Center*
Science Focus: ESS1.C, ESS2.A, ESS2.C, ESS2.D, ESS3.C, ESS3.D, ETS2

Nikki Hoier (*nhoier@ISS-CASIS.org*), **Diane Matthews**, and **Dan Barstow** (*dbarstow@iss-casis.org*), CASIS, Melbourne, Fla.

The International Space Station is an amazing resource for learning and exploring. In this session, learn how to bring ISS resources into your classroom. Door prizes!

■ ■ ■ A Cross-Curricular Contamination Case: Integrating Core Content Through Self-Paced Learning

(Grades 9–11) *103C, Music City Center*
Science Focus: LS2, LS4, PS1

Alexis Custer (*alexis.bizzaro@gmail.com*), Princeton High School, Princeton, N.J.

Jennifer Alessio (*jmallezio@gmail.com*), Robbinsville High School, Robbinsville, N.J.

Discover how students can embark on a self-paced cross-curricular unit by solving a lead poisoning case study using chemical, biological, ecological, and mathematical concepts.

We Are Engineers, Too!

(Grades P–3) *104A, Music City Center*
Science Focus: ETS1, SEP

Valerie Patel (*valerie_m_patel@mcpsmd.org*) and **Amy Kanapesky** (*amy_k_fletcher@mcpsmd.org*), William B. Gibbs, Jr. Elementary School, Germantown, Md.

Hear how to successfully engage students in the engineering design process in early childhood classrooms! Walk away with sample lessons and project ideas. Find out how to teach your students to be excited about making mistakes!

The Maker Movement in EC–Grade 8 Classrooms

(Grades P–8) *106A, Music City Center*
Science Focus: ETS, LS1.A, LS4.D, PS2.A, PS2.B, PS3.B, PS3.C, SEP

Elizabeth Ross, **Beth Sanzenbacher**, **Deanna McBeath** (*@edumcbeath; dmbeath@bzaeds.org*), and **Jeremy Siegel** (*jsiegel@bzaeds.org*), Bernard Zell Anshe Emet Day School, Chicago, Ill.

Incorporating the Maker Movement into formal learning environments can be challenging. This presentation showcases engaging early childhood through grade 8 scaffolded Maker curricula that meet the NGSS practices.

Glaciers: Traveling Time Capsules

(Grades 6–12) *Davidson A2/3, Music City Center*
Science Focus: ESS, SEP8

Sylvia Tufts, Retired Educator, Flossmoor, Ill.

The study of glaciers' locations, movement, and composition provides an excellent opportunity to observe and analyze the effects of global climate conditions and changes over time.

Rigor and Reasoning—From Knowing Science to Understanding Science

(Grades 6–12) *Acoustic, Omni*
Science Focus: GEN

Emily Freeland (*@EmilyKFreeland*), Alabama State Dept. of Education, Montgomery

Increase students' reasoning and application of scientific knowledge and processes using depth of knowledge. Explore ways to use problem-solving protocols and tasks to deepen understanding.

Food Chains: Using Field Surveys That Give Real Results

(Grades 6–8) *Broadway G, Omni*
Science Focus: LS2.B

Frederick Maier (*fredmaier@sbcglobal.net*), Village of Itasca Nature Center, Itasca, Ill.

Emphasis will be placed on three hands-on survey techniques that allow students to calculate actual numbers of plants, herbivores, and carnivores in creating a food chain.

Argumentation and Making the Transition to NGSS: How Do Students Develop Fluency in Engaging in Argument from Evidence?

(Grades 6–8) *Broadway K, Omni*
Science Focus: GEN, SEP7

James Narvaez (*james.narvaez@ousd.k12.ca.us*), Oakland (Calif.) Unified School District

The practice of argumentation connects the CCSS and NGSS, but how is this developed? Engage in an NGSS-focused performance task and hear lessons learned.

INF Hosting STEM Nights? Use Inquiry-Based Investigations to Engage Learners of All Ages

(Grades 6–12) *Cumberland 2, Omni*
Science Focus: INF, NGSS

Karen Jacobs, Alief ISD, Houston, Tex.

Have you ever had to plan a STEM or Science Night and needed help crafting activities to engage the community? Well, come learn simple strategies and labs you can use to truly engage learners of all age groups!

Simulate STEM Online Through Virtual Clinical Trials

(Grades 8–College)

Cumberland 4, Omni

Science Focus: GEN, NGSS

Lynn Lauterbach (lynnlauterbach@gmail.com), Retired Teacher, Loveland, Colo.

Kristi Bowling, Rice University Center for Technology in Teaching and Learning, Houston, Tex.

Expose high school students to scientific and biomedical engineering practices and careers using free online simulations that engage them in technology while designing authentic neuroscience-based clinical trials. Built-in assessment notebook.



Tesla Tales

(Grades 7–12)

Cumberland 5, Omni

Science Focus: GEN, SEP3

Carlos Villa (villa@magnet.fsu.edu), National High Magnetic Field Laboratory, Tallahassee, Fla.

Follow the path of discovery through the history of magnetism—with ideas for bringing these scientists and their ideas into your classroom.

Creating a Professional Learning Community to Facilitate Collaboration in Science-Inclusion Classrooms

(Grades 6–12)

Electric, Omni

Science Focus: GEN

Regina Borriello (@Karategrl80; rborriello@gmail.com), Clifton High School, Clifton, N.J.

The goals of this session are to provide insight into creating and sustaining a learning community. Come discuss issues encountered while co-teaching in science classrooms.

Integration of the NGSS into an Interdisciplinary Freshman Experience Course

(Grades 12–College)

Mockingbird 4, Omni

Science Focus: GEN, SEP6, SEP7

Cynthia Kern (Cindy.L.Kern; cindy.l.kern@gmail.com), Quinnipiac University, Hamden, Conn.

Rosemary Whelan (rwhelan@newhaven.edu), University of New Haven, West Haven, Conn.

Hear how eight professors from five different disciplines facilitated 160 freshmen from all majors to evaluate sustainable decision-making through evidenced-based argumentation and engagement in campus-wide activism projects.

Teaching as Storytelling: How to Infuse History, Mystery, and Inquiry into Your Science Topic Teaching (General)

Music Row 2, Omni

Science Focus: GEN

David Schuster (david.schuster@wmich.edu), Western Michigan University, Kalamazoo

Revitalize science content by creating storylines and infusing “vignette snippets” of history, mystery, and inquiry at just the right places. Leave with a booklet of science examples and vignettes.

What Happens When the Train Runs Off the Tracks? A Problem-Based Learning Module

(Grades 4–9)

Music Row 3, Omni

Science Focus: ESS3, ETS

Cheryl Lindeman (clindeman@randolphcollege.edu), Randolph College, Lynchburg, Va.

I’ll share Problem-Based Learning (PBL) activities incorporating ways children make STEM decisions by experiencing local stakeholders’ roles during a local environmental event.

Retiring? Tips for the Next Phase of Your Life

(General)

Fisk One, Renaissance

Science Focus: GEN

Joyce Gleason (joycegle@earthlink.net), Educational Consultant, Punta Gorda, Fla.

Susan Clay (suzieclay@aol.com), Ashland University, Ashland, Ohio

Join the Retired Members Advisory Board and explore options for this next stage of life. Topics will include volunteerism, loss of professional identity, and others.

5:00–6:00 PM Hands-On Workshops

Ramps and Pathways: An Integrated STEM Activity

(Grades P–2) 104C, Music City Center

Science Focus: ETS1, PS2, CCC2, CCC3, CCC4, SEP

Beth Van Meeteren (*beth.vanmeeteren@uni.edu*), University of Northern Iowa, Cedar Falls

Peggy Ashbrook (*scienceissimple@yahoo.com*), NSTA Early Years Columnist, Alexandria, Va.

Ramp up new learning in your classroom by having your students design and construct marble runs using cove molding and unit blocks while integrating physics, technology, engineering, and spatial thinking.

Did I Learn That? Tips and Techniques to Ensure Mastery of Science Concepts

(Grades 3–5) 104D, Music City Center

Science Focus: GEN

Shirley Willingham, Rice University, Houston, Tex.

Discover how to incorporate vocabulary activities and short readings into a review of previously taught science concepts. Walk away with a variety of ready-to-use resources!

Sound and Waves: An Integrated K–8 Hands-On Approach Supporting the NGSS and CCSS ELA

(Grades 3–8) 104E, Music City Center

Science Focus: PS4

Chihche Tai (*cctai59@gmail.com*), **Karin Keith** (*keithkj@etsu.edu*), **Laura Robertson** (*robertle@etsu.edu*), and **Renee Moran** (*ricemoran@etsu.edu*), East Tennessee State University, Johnson City

Leave with ideas to build confidence and understanding about using hands-on activities and literacy strategies as tools to understand the nature of wave movement.

Explore Rocks Part 1: Rock Cycle and Igneous Rocks

(Grades 3–College) 105A, Music City Center

Science Focus: ESS2.A, CCC1, CCC5, CCC6, SEP3, SEP8

Davida Buehler (*dbuehler@geosociety.org*), The Geological Society of America, Boulder, Colo.

Walk away with numerous inquiry-based activities that you can use immediately in your upcoming lessons on the rock cycle and igneous rocks!

Teaching the High School NGSS Disciplinary Core Ideas: Earth Systems and Human Sustainability Using Real Earthquake Location Data

(Grades 9–12) 106B, Music City Center

Science Focus: ESS2.B, ESS3.B, ESS3.C

Patrick McQuillan (*pmcquillan@lsc.org*), Liberty Science Center, Jersey City, N.J.

John Taber (*taber@iris.edu*), IRIS, Washington, D.C.

Enhance plate tectonics, natural hazards, and human impact lessons using real earthquake data. A free online global earthquake database will be explored using NGSS-focused lessons.

Riding the Waves

(Grades 4–12)

Legends A, Omni

Science Focus: PS4.A, PS4.B

Ingrid Salim (*isalim7@gmail.com*), Da Vinci Charter Academy, Davis, Calif.

Kathleen Gill (*@kmgill135; kmgill135@gmail.com*), Robert E. Willett Elementary School, Davis, Calif.

Explore the performance expectation progression sequence of the NGSS through the waves and electromagnetic radiation disciplinary core idea.

INF Introduction to LinkEngineering

(Grades P–12)

Legends C, Omni

Science Focus: ETS, INF, SEP1, SEP6

Greg Pearson (*gpearson@nae.edu*), National Academy of Engineering, Washington, D.C.

Ted Willard (*@Ted_NSTA; twillard@nsta.org*), Program Director, NGSS@NSTA, NSTA, Arlington, Va.

Cary Sneider (*csneider@pdx.edu*), Portland State University, Portland, Ore.

We will illustrate the features of the new National Academy of Engineering website for supporting the implementation of engineering in preK–12 education (*www.LinkEngineering.org*).

CRASH Science! Investigating the Dangers of Distracted Driving

(Grades 6–12)

Legends E, Omni

Science Focus: LS, PS, SEP

Griff Jones (*gjones@coe.ufl.edu*) and **Linda Jones** (*lcjones@coe.ufl.edu*), University of Florida, Gainesville

Learn how to use easy-to-implement biology and physics-related STEM inquiry activities and dramatic web-based crash videos to teach students about the dangers of distracted driving.

Stimulate Student Learning with Food!

(Grades 7–12)

Legends G, Omni

Science Focus: GEN

Laurie Hayes (lhayes@cart.org), The Center for Advanced Research and Technology, Clovis, Calif.

Susan Hartley (susan.mumford.hartley@hotmail.com), Hinkley High School, Aurora, Colo.

Use food as a key ingredient to successful learning. Join us in a hands-on learning experience using food to teach science standards and integrate CCSS principles. Handouts and door prizes included!

I'm the Teacher...How Do I Teach About Nature of Science?

(Grades 4–College)

Center Ballroom, Renaissance

Science Focus: GEN, SEP

Julie Angle, (julie.angle@okstate.edu), Oklahoma State University, Stillwater

To strengthen science literacy skills, learn about engaging activities that can be used to explicitly address aspects of nature of science. Take home handouts to use in grades 4–16 science classrooms or in teacher preparation courses.

The Argumentation Toolkit: The Lawrence Hall of Science Presents a Collection of Multimedia Resources to Support Teacher Learning About Argumentation

(Grades 4–10)

Fisk Two, Renaissance

Science Focus: ESS2, LS3, SEP7

Traci Wierman, Kathryn Quigley, Suzanna Loper (sjloper@berkeley.edu), and **Phaela Peck** (ppeck@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley

We will showcase The Argumentation Toolkit, a new online multimedia resource supporting science teachers striving to infuse argumentation into their program.

5:30–6:00 PM Presentations



Primary Literature: Students Reading Real Science

(Grades 9–College)

101E, Music City Center

Science Focus: GEN, SEP

Melissa McCartney (mmccartn@aaas.org), Science/AAAS, Washington, D.C.

Science in the Classroom (www.scienceintheclassroom.org) is a collection of annotated research papers designed to help students understand the structure and workings of professional scientific research.

Think It, Map It, Write It, Learn It!

(Grades P–2)

104B, Music City Center

Science Focus: LS1, PS1, PS2, PS4

Kimberly Lott (kimberly.lott@usu.edu), Utah State University, Logan

Deborah Roghaar (deb.roghaar@usu.edu), Edith Bowen Laboratory School, Logan, Utah

We will illustrate how different thinking maps can be used for writing in science during grades K–2 with connections made to CCSS ELA and NGSS.

Are You Bohr'd with Bonding?

(Grades 8–12)

Music Row 1, Omni

Science Focus: PS

Stephanie Hawthorne, Hewitt-Trussville Middle School, Trussville, Ala.

Learn to use a 3-D manipulative when teaching the concepts of forming ions, naming, and bonding. Leave with resources and ways to build the manipulative on a budget.

6:30–7:30 PM Networking Opportunity
LinkEngineering Reception

Legends F, Omni

Join National Academy of Engineering staff and members of NAE’s LinkEngineering website for drinks and hors d’oeuvres in this informal gathering of educators interested in supporting K–12 engineering. This event is free.

8:00–10:00 PM Networking Opportunity
Boot Scootin’ Boogie!

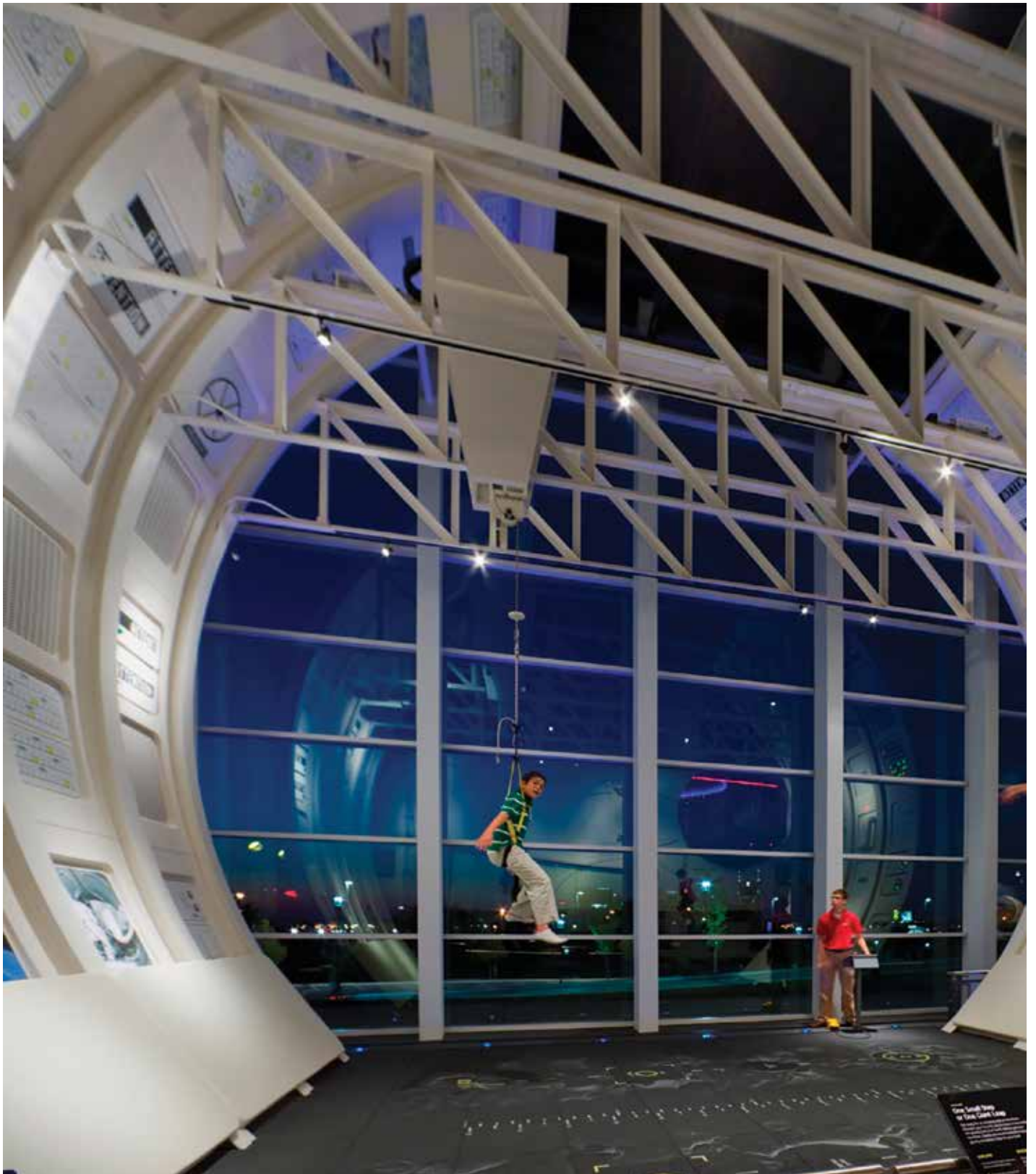
located above the Whiskey Bent Saloon, Frontier Room

Open to y’all! *Git yerself* over to the Frontier Room (directions below) for an opportunity to network and meet up with your colleagues on the last night of the conference. This evening of entertainment will feature...Charity Byars, performing artist and band, as well as line dance lessons and traditional bar foods for sale, including pulled pork sandwiches, sliders, tater tots, and more (prices range from \$5 to \$15). Enjoy a cash bar with the “Boot Scootin’ Bourbon” drink special!

Located above the Whiskey Bent Saloon, the Frontier Room has a separate entrance, which is located around the corner on 3rd Avenue and up the stairs behind the Saloon.

Frontier Room: 306 Broadway, 615-401-2580





—Photo courtesy of Adventure Science Center

At Adventure Science Center’s Moonwalker exhibit, visitors can experience the feeling of walking on the moon and find out how high they can jump—and how lightly they come back down when only in $1/6$ gravity! Show your NSTA badge and receive half off general admission to Adventure Science Center. See page 12 of Volume 1 to learn more about this special offer.

8:00–8:30 AM Presentations

Reasons Students Struggle with Reasoning

(Grades 5–9) 106A, Music City Center

Science Focus: GEN, SEP7

Laura Rossier (*rossierlj@gmail.com*), F.A. Day Middle School, Newtonville, Mass.

Using student work, we'll explore struggles with argumentation, scaffolding instruction to elicit reasoning that is both logical and based on scientific principles.

8:00–9:00 AM Presentations

iPad Apps for STEM Activities in the Elementary Classroom

(Grades K–6) 104B, Music City Center

Science Focus: GEN, NGSS

Janet Jordan (*janetjordan37@gmail.com*), Retired Educator, Fort Wayne, Ind.

Discover many excellent engaging and challenging iPad apps for STEM classroom activities. Current award-winning children's books will be linked to the apps presented, along with practical tips for integrating iPad apps into the curriculum.

What Constitutes High-Quality Discussion in a Science Classroom?

(Grades 2–8) 106C, Music City Center

Science Focus: GEN, SEP7

Emily Weiss (*weisse@berkeley.edu*), The Lawrence Hall of Science, University of California, Berkeley

Watch and analyze several video examples to understand what constitutes high-quality discussion in the science classroom for students in grades 3–5.

INF Nature on My Block: Place-Based Ecology Lessons for Urban Students

(Grades 1–5) 110A, Music City Center

Science Focus: LS, INF

Cezar Simeon (*csimeon@ccookschool.org*), Catherine Cook School, Chicago, Ill.

Inspire city-bound students to discover the wonders of the urban woodland ecosystem that is their neighborhood.

Sources of Pedagogical Content Knowledge for Teaching Life Sciences in Middle School

(Grades 5–8) 205B, Music City Center

Science Focus: LS

David Santibáñez (*dpsantibanez@gmail.com*), Illinois Institute of Technology, Chicago

Learn about diverse ways to improve your life science pedagogical content knowledge to develop lesson plans based on the NGSS.

Science Area

A science area category is associated with each session. These categories are abbreviated on the Science Focus line for each session listing. On page 119, you will find the conference sessions grouped according to their assigned science area category.

The science areas and their abbreviations are:

- LS = Life Science**
- PS = Physical Science**
- ESS = Earth and Space Science**
- ETS = Engineering, Technology, and the Application of Science**
- GEN = General Science Education**
- INF = Informal Science Education**

NGSS

See page 12 for a complete list of the *NGSS* codes used in this program.

Strands

The Nashville Conference Committee has planned the conference around the following four strands, enabling you to focus on a specific area of interest or need. Strand events are identified by icons throughout the daily program. For strand descriptions, see page 6.



Setting the Stage: Scientific Literacy



Building the Band: Involving Community Stakeholders



Harmonizing Concepts: Integrating Instruction



Stringing It All Together: Three-Dimensional Learning

The following icons will be used throughout this program.



NSTA Press® Sessions



Sessions highlighting STEM learning experiences that occur in out-of-school environments.

Learning Targets for Student-Led Labs

(Grades 6–8) 205C, Music City Center

Science Focus: GEN, SEP3, SEP8

Kirby Selle, Christel House Academy, Indianapolis, Ind.
Prepare a mini investigation, examine student work, and receive a copy of learning targets to help students design their own investigative lab.

Teach Engineering Principles on the Cheap with Concrete

(Grades 7–12) 206 A/B, Music City Center

Science Focus: ETS

Debbie Goodwin (nywin@hotmail.com), Retired High School Science Teacher, Chillicothe, Mo.

Solidify new learning in your classroom by teaching engineering with concrete and other composite materials. Discover inexpensive STEM projects that engage students using the #1 building material in the world. NGSS correlations shared.

Forensics 101: From the Ground Up

(Grades 6–12) 207B, Music City Center

Science Focus: GEN

Kristie Cannon (kcannon@hoover.k12.al.us), Spain Park High School, Birmingham, Ala.

Receive materials and ideas to help you get your forensic science program off the ground.

INF Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events

(Grades 9–12) 207C, Music City Center

Science Focus: ESS1, ESS2, ETS2, INF, PS1.B, PS1.C, PS2.A, PS2.C, PS3.D, PS4.B, PS4.C, SEP1, SEP2, SEP3, SEP4, SEP5

Donna Young (dlyoung.nso@gmail.com), Chandra X-Ray Center, Bullhead City, Ariz.

Science Olympiad coaches will be provided information on strategies, extensive resources, and content for regional, state, and national competitions by the National Astronomy Event Supervisor.

Go Green! Build and Sustain a Project-Based Learning Garden Program at Your School!

(Grades 5–12) 208A, Music City Center

Science Focus: GEN

Maurice DiGiuseppe (maurice.digiuseppe@gmail.com), University of Ontario Institute of Technology, Oshawa, Ont., Canada

Blair Sawa (bsawa@pvnccdsb.on.ca), Peterborough, Victoria, Northumberland and Clarington Catholic School Board, Peterborough, Ont., Canada

Join us for an engaging and informative workshop demonstrating strategies for building and sustaining a cross-curricular Project-Based Learning garden program at your school.

Science in the One-to-One Classroom

(Grades 6–12) 208B, Music City Center

Science Focus: GEN

Lindsay Knippenberg (@ScienceWithMsK; lindsayknippenberg@mqsd.k12.nc.us) and **Barbara Huth** (@Huth_Barbara; barbarahuth@mqsd.k12.nc.us), Mooresville High School, Mooresville, N.C.

What does a successful one-to-one science classroom look like? Gain management tips, activities, and lesson ideas for incorporating technology in your science class.

Integrating Literacy Standards in Science

(Grades 9–12) 209A, Music City Center

Science Focus: GEN, CCC4, SEP1, SEP2, SEP7

Stephanie Harmon (@stephharmon41; stephanie.harmon@rockcastle.kyschools.us), Rockcastle County High School, Mount Vernon, Ky.

Incorporating literacy standards in science can be a natural part of how we teach by using a variety of strategies and resources.

Partnering with Community Resources to Create a Whodunit

(Grades 9–12) 209B, Music City Center

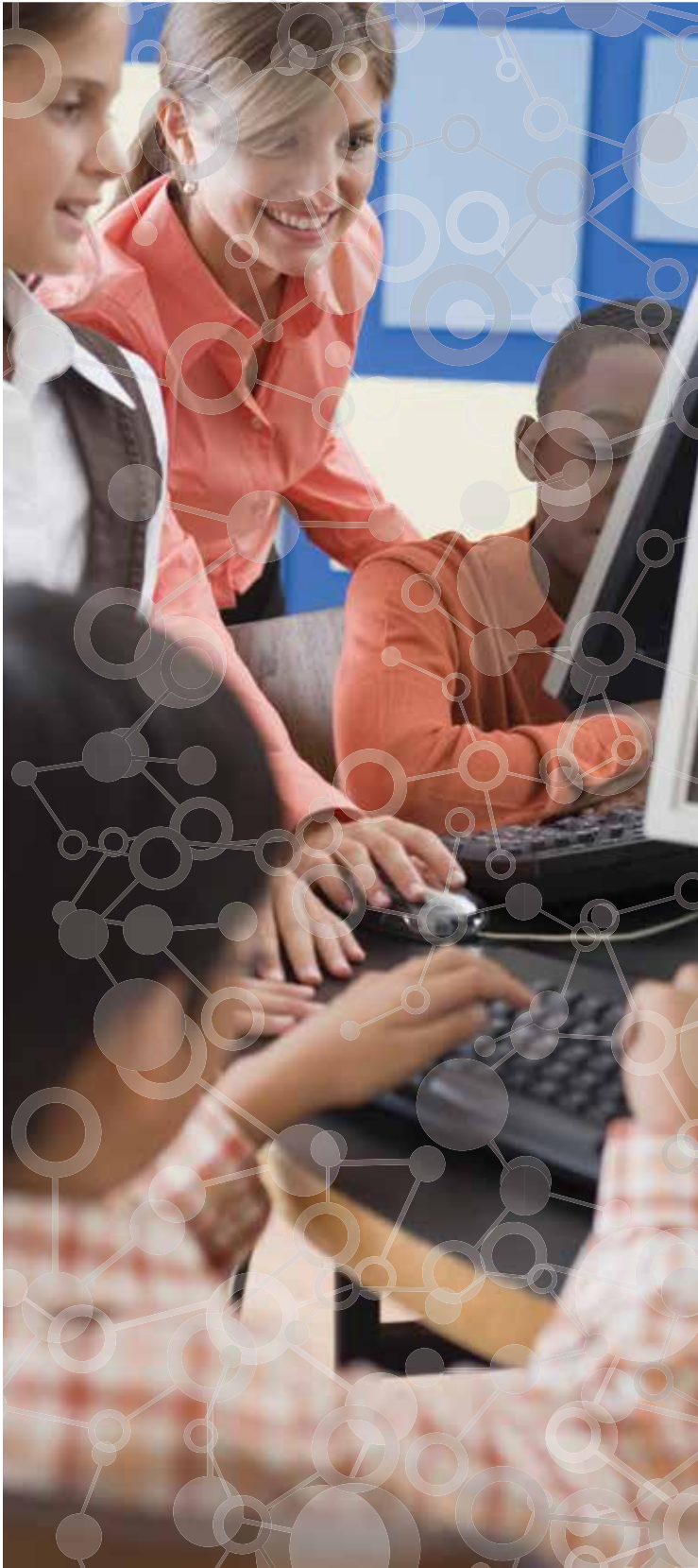
Science Focus: GEN

Mary Anne Butler, Windsor (Conn.) Public Schools

Learn how to partner with businesses, law enforcement, government, and institutes of higher education to create authentic performance-based assessments for students.



eCYBERMISSION
ACCEPT THE CHALLENGE



HELP BUILD STUDENTS' INTEREST IN STEM WITH **eCYBERMISSION** IN YOUR CLASSROOM

eCYBERMISSION is a web-based STEM competition, free to students in grades 6-9.

Compete for Awards up to
\$9,000 in U.S. Savings Bonds

For more information, visit us at
Booth #1046

WWW.ECYBERMISSION.COM

Administered by



Industry's Role in Creating the Next Generation of Scientists

(General) 209C, Music City Center
Science Focus: GEN

Skyler Wiseman, Washington University in St. Louis, Mo. How did a leading research-based university build collaboration with local science industries to help support an early childhood science program that has grown into a K–5 instructional program? MySci is leveling the playing field for high-quality science education in the St. Louis area. Come hear about our journey and discuss yours.

INF Scientists for Tomorrow: An Initiative to Promote STEM in Out-of-School-Time Frameworks

(Grades 4–12) Davidson A2/3, Music City Center
Science Focus: ETS1, INF

Marcelo Caplan (@SfTinitiative; *mcaplan@colum.edu*), Columbia College Chicago, Ill.

Scientists for Tomorrow is a program designed to provide urban youth with information and skills related to STEM through a partnership between the university and community centers. Review results and lessons learned from three years so far in my community.

8:00–9:00 AM Hands-On Workshops



NSTA Press® Session: CCSS ELA and Literacy + NGSS = Even More Brain-Powered Science

(Grades 5–College) 101C, Music City Center

Science Focus: GEN, CCC1, CCC2, CCC3, CCC4, CCC7, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Thomas O'Brien (*tobrien@binghamton.edu*), Binghamton University, Binghamton, N.Y.

Discrepant event activities and cartoons model how-to integrate ELA and science literacy standards to show that “the whole is greater than the sum of the parts.”

A Beginner's Guide to Engineering Design Challenges

(Grades 3–5) 104C, Music City Center

Science Focus: ETS1

Holly Mentillo (*mentillo@earthlink.net*), Ocean Breeze Elementary School, Melbourne, Fla.

Betty Bigney (*bettybigney@hotmail.com*), Dixon Elementary School, Holly Ridge, N.C.

Join us for a step-by-step walk through the engineering design challenge process. Come find out how much fun they can be and take home a lot of ideas for your classroom!

3D Is Your Beak Stuck? How to Use the Three Dimensions of the NGSS in a Natural Selection Activity

(Grades 6–College) 103A, Music City Center

Science Focus: LS4.B, CCC2, SEP2

Virginia (Gini) Oberholzer Vandergon (*virginia.vandergon@csun.edu*) and **Mike Rivas** (*mike.rivas@csun.edu*), California State University, Northridge

Find out how to take a classic natural selection activity on Island Beak Evolution and transform it into a NGSS-rich lesson.

Exploring Different Acid/Base Indicators in the Classroom

(Grades K–5) 104D, Music City Center

Science Focus: GEN, NGSS

Rebecca Dyasi (*bdyasi@aol.com*), Long Island University, Brooklyn, N.Y.

Hubert Dyasi, Retired Educator, Yonkers, N.Y.

Learn how prospective teachers engage in and use experiences with plant-based and commercial indicators to engage city children in science practices, understandings, and communication and self-assessment skills.

Chapter Books at the Crossroads of the NGSS and CCSS

(Grades 6–9) 103C, Music City Center

Science Focus: GEN

Christine Anne Royce (@caroyce; *caroyce@aol.com*), Shippensburg University, Shippensburg, Pa.

Examine different chapter book units that can help to integrate the components of the NGSS and elements of the CCSS.

Engineering Through Children's Literature

(Grades K–5) 104E, Music City Center

Science Focus: ETS1, SEP

Patricia Maze (@AMSTI_Athens; *patricia.maze@athens.edu*), AMSTI-Athens, Ala.

Emily McGahee (@AMSTI_Athens; *emily.mcgaher@athens.edu*), Athens State University, Athens, Ala.

Put the science and engineering practices into action in your classroom? Come design, create, and test solutions to problems presented in popular children's literature.

Project-Based Learning (PBL) for 21st-Century Thinkers and Innovators

(Grades P–8) 105A, Music City Center

Science Focus: GEN, SEP

Seema Khan, RAFT San Jose, Calif.

Implement the PBL approach to help students build knowledge and skills through technology and real-world experiences while implementing NGSS in your classroom.

Climate Science: How Can Such a Serious Topic Be So Much Fun?!?

(Grades 4–8) 105B, Music City Center

Science Focus: ESS2.C, ESS2.D, ESS3.C, ESS3.D, CCC2, CCC4, SEP2, SEP3, SEP4

Kathleen Christie-Blick (*kchristieblick@socsd.org*), Cottage Lane Elementary School, Blauvelt, N.Y.

Jacob Tanenbaum (*jtanenbaum@socsd.org*) and **Samantha Levine** (*sdd131424@yahoo.com*), South Orangetown Central School District, Blauvelt, N.Y.

Harness this NGSS’s Earth science unit to teach climate change. Use classroom-tested hands-on activities that deepen scientific understanding of this important core idea. Come play!

Hot Topics Workshop: Nuclear Energy

(Grades 9–12) 201B, Music City Center

Science Focus: PS

Kathleen Dwyer (*@msdchemistry; kathleen.dwyer@mrh-schools.net*), MRH High School, Maplewood, Mo.

Tracie Cain (*tcain02@charter.net*), Visitation Academy, Saint Louis, Mo.

Activate your nuclear knowledge! Use marble nuclei to model isotopes, radioactive decay, and fragmentation. Learn how these processes are used to create usable energy.

Illuminate Intelligence with Creative Circuits

(Grades K–12) 202A, Music City Center

Science Focus: PS, SEP2

Gina Tesoriero (*@stemssuccessedu; ginatoriero@gmail.com*) and **Amanda Solarsh** (*amandasolarsh@gmail.com*), Simon Baruch MS104, New York, N.Y.

Hands-on circuitry exploration can light up your classroom. Explore accessible materials that can electrify circuits and STEAM up your curriculum.

Learning to Fail: Building Confidence with Data Collection

(Grades 9–12) 202C, Music City Center

Science Focus: GEN, NGSS

Jessica Kohout (*@MrsKohout; jessica_kohout@hcpss.org*), Reservoir High School, Fulton, Md.

Do your students have trouble taking risks for fear of failure? Give them a science “toolbox” to overcome any challenge in the lab.

EdTech and Your Ideal Classroom: Using Educational Technology to Support a Science Classroom Community

(Grades 9–College) 204, Music City Center

Science Focus: GEN, SEP

Stephen Traphagen (*@mrtraphagen; stephen@mrtraphagen.com*), Rolling Meadows High School, Rolling Meadows, Ill.

Kirstin Milks (*@DrMilks; kmilks@mccsc.edu*), Bloomington High School South, Bloomington, Ind.

Go beyond self-paced mastery, flipped classrooms, and increasing lab time. Come think about ways to use EdTech to make time for intellectual risk-taking, science practice, and promoting classroom community.

Science Is a Social Endeavor: Scientific Inquiry Through Collaborative Work

(Grades 7–12) 205A, Music City Center

Science Focus: ESS, PS, CCC, SEP1, SEP4, SEP6, SEP7, SEP8

Susan Kelly, University of Illinois at Urbana-Champaign, Champaign

Join education researchers from the University of Illinois, and learn how to support authentic scientific inquiry by implementing collaborative learning activities in your science classroom.

Your Ecological Footprint in a 3-D NGSS Classroom

(Grades 4–College) 207D, Music City Center

Science Focus: ESS, CCC

Laurel Kohl (*kohl1@easternct.edu*), The Institute for Sustainable Energy, Willimantic, Conn.

The world’s resources are finite, so what alternatives are there? This 3-D three-dimensional lesson from *www.ctenergyeducation.com* allows grades 4–12 students to explore their impact on the world.

RESCHEDULED TO SATURDAY, 2:00 PM (see program changes)

8:30–9:00 AM Presentations



Using Expeditions as Contexts for Teaching Science: Adventure Mississippi River

(Grades 5–12) *101E, Music City Center*
Science Focus: GEN

Brant Miller (*bgmiller@uidaho.edu*), University of Idaho, Moscow

Hear about an approach to engage students in authentic science learning through an adventure on the Mississippi River.

Universal Design for Learning: What It Is, and What It Isn't

(Grades 4–9) *106A, Music City Center*
Science Focus: GEN

Gregory Taylor, Thurgood Marshall High School, Dayton, Ohio

Receive an overview of Universal Design for Learning as common misconceptions are addressed. Find out what implementing UDL would look like in your science classroom.

9:30–10:00 AM Presentations



Science Fair: A Learning Progression Across K–5

(Grades K–5) *101E, Music City Center*
Science Focus: GEN, CCC, SEP

Teresa Higgins (*teresa.higgins@unco.edu*), University of Northern Colorado, Greeley

Lisa Dye (*lisa_dye@dpsk12.org*), Lena Lovato Archuleta Elementary School, Denver, Colo.

Challenged with school-wide science fairs? Looking for ways to support science literacy in your school's program? We will share the details and strategies of scaffolding and supporting a whole-school K–5 model for science fairs, including insights for supporting English language learners and addressing standards.

How Does Vocabulary Fit into PBL for English Language Learners?

(Grades K–6) *104A, Music City Center*
Science Focus: GEN, SEP

Sara Holm, Smithridge STEM Academy, Reno, Nev.

Hear how teachers from an elementary STEM academy integrate focused vocabulary instruction into Project-Based Learning.

Let's Explore: The Changes That Surround Us

(Grades 4–8) *106A, Music City Center*
Science Focus: ETS, LS1, LS2, PS2.C, PS4.C

Beth Guzzetta (*@bethguzzetta; bguzzetta@allendalecolumbia.org*), **Martha Bjorklund** (*mbjorklund@allendalecolumbia.org*), and **Kate Bjorklund** (*kbjorklund16@allendalecolumbia.org*), Allendale Columbia School, Rochester, N.Y.

Hear how our students identify factors that negatively affect the ecosystem in our community and state, and then develop student-motivated projects addressing ecosystems restoration.



Planting the Seeds to Cultivate Meaningful Science Practices in Garden Classrooms

(Grades P–3) *103B, Music City Center*
Science Focus: LS, CCC1, CCC4, CCC5, CCC6, SEP2, SEP3, SEP6

Michelle Fleming (*michelle.fleming@wright.edu*), Wright State University, Dayton, Ohio

Colleen Saxen (*colleenqsaxen@gmail.com*), Kozmetsky Global Collaboratory, Stanford University, Dayton, Ohio

Eileen Simon (*e_d_simon@hotmail.com*) and **Alison Peters** (*alisonraepeters@yahoo.com*), Oakwood City School District, Dayton, Ohio

This project engaged the community in creating school gardens. Learn interactive science notebook methods, experiments, and investigations connecting garden classrooms to NGSS practices and CCSS.

Tci™ Booth 256



Session 1

Date: Thursday, Mar 31

Time: 2:00-3:30 PM

Room: Music City Center,
108

Inspire Students
to Jump to the
Inquiry Arc

Session 2

Date: Friday, Apr 1

Time: 12:00-1:30 PM

Room: Music City Center,
108

Analyzing and Interpreting
Data Using *Tci's Bring
Science Alive!*



Session 3

Date: Saturday, Apr 2

Time: 10:00-11:30 AM

Room: Music City Center,
108

Modeling the Earth, Sun
and Other Stars with
Bring Science Alive!

teachtci.com

9:30–10:30 AM Presentation

Project-Based Learning: How It Has Changed Teaching and Learning in Our School

(Grades K–8) *103C, Music City Center*
Science Focus: GEN, SEP

Amanda Popovich (apopovich@dps61.org) and **Ashley Keeling**, Dennis Lab School, Decatur, Ill.

Hear how we have implemented Project-Based Learning. Our students are tackling real-world authentic problems through true content integration. We can help you get there, too!

Transforming Schools Through Professional Development: An Interconnected Approach

(Grades P–5) *104B, Music City Center*
Science Focus: GEN, NGSS

Jenny Flowers (jflowers@fieldmuseum.org), The Field Museum, Chicago, Ill.

Learn about the layered and interconnected professional learning strategies used in a multi-institutional partnership designed to transform preK–3 teachers' science instruction in 10 Chicago elementary schools.

Coding Computer Games to Motivate Middle School Science Students

(Grades 5–12) *108, Music City Center*
Science Focus: GEN

Joanne Barrett (@jbarrettsrq; jbarrett@oda.edu), The Out-of-Door Academy, Middle & Upper School, Sarasota, Fla.

Learn how we use Scratch, a free programming environment with no coding experience necessary, to create games and animations in creative ways.

Fall Head Over Heels for Flipping Your Classroom!

(Grades 6–12) *109, Music City Center*
Science Focus: GEN

Lisa Wolfinger, Michigan Connections Academy, Okemos
Want to learn more about how to engage students in science? Come to our flipped session that integrates mastery learning and focuses on individualized instruction to help your students find success.

“Pitching” Student Innovation and Community Building Through Shark Tank

(Grades 6–12) *202A, Music City Center*
Science Focus: ETS1

Amanda Solarsh (amandasolarsh@gmail.com) and **Gina Tesoriero** (@stemsuccessedu; ginatesoriero@gmail.com), Simon Baruch MS104, New York, N.Y.

Lead students to the perfect pitch for their innovative solutions through a *Shark Tank*–inspired engineering design project that brings the community into the classroom.

Using Flipped Classrooms to Assess the Mastery of Objectives in Middle School

(Grades 7–8) *205B, Music City Center*
Science Focus: GEN

John Pappas, Carleton Washburne School, Winnetka, Ill.

Hear how to effectively use a mastery model to assess students' performance on objectives in a flipped classroom framework.

Moon “Face” Model

(Grades 5–8) *205C, Music City Center*
Science Focus: ESS1.A, ESS1.B, CCC4

Whitney Jackson (wjackson@go.olemiss.edu), The University of Mississippi, University, Miss.

Experience how to bring this content down to Earth so all students can leave your class with a better understanding of what causes moon phases.

Supporting STEM/STEAM Curriculum in the Digital Age

(Grades 5–12) *207A, Music City Center*
Science Focus: GEN

Presenter to be announced

Find out how PBS is helping educators across the country embrace the digital age and promote more meaningful integration of STEM/STEAM across the curriculum.

Integrating Reading and Math in the Science Curriculum to Increase Student Achievement

(Grades 6–12) *207B, Music City Center*
Science Focus: PS1, SEP1, SEP2, SEP4, SEP5

Danielle Moore, Fort Worth (Tex.) ISD

With more students entering science classrooms at or below grade level in reading and/or mathematics, it is imperative that the science instructor strategically plan and execute methods that will increase student achievement by embedding reading and/or mathematics seamlessly into the science curriculum.

Science Teaching for Social Justice

(Grades 6–College) *207D, Music City Center*
 Science Focus: ETS2.B, CCC1, CCC2, CCC7, SEP1, SEP3, SEP4, SEP6, SEP7, SEP8

Moses Rifkin, University Prep, Seattle, Wash.

Teaching for social justice can be part of science education. A scientific exploration and analysis of who does science leads to questions of equity.

Beyond the Gumdrop Mountain: Using Models in Your Classroom

(Grades 9–12) *209A, Music City Center*
 Science Focus: GEN, SEP2

Lesley Shapiro (*lesley.shapiro@ppsd.org*), Classical High School, Providence, R.I.

Put away the construction paper, glue, clay, and paint. Come discover the exciting new world of models opened up by the NGSS.

Cheap STEM Lessons for the Classroom

(Grades 9–12) *Davidson A2/3, Music City Center*
 Science Focus: ETS, SEP

Briana Richardson (*briana.richardson@wchcs.org*), Washington High School, Washington Court House, Ohio

Scott Spohler (*sspohler@mplsd.org*), Madison-Plains High School, London, Ohio

Explore STEM with concrete, metal, and clay. Apply math concepts and pull in lots of real-world examples. Supplies are cheap and kids love destructive testing!

9:30–10:30 AM Hands-On Workshops



NSTA Press® Session: What Are They Thinking? Investigating the Moon Through Formative Assessment Probes and Strategies That Link Concepts and Practices

(Grades 5–College) *101C, Music City Center*
 Science Focus: ESS1.A, ESS1.B, CCC, SEP

Page Keeley (*@CTSKeeley; pagekeeley@gmail.com*), 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla.

Brian Kruse (*@astroteacher8; bkruse@astrosociety.org*), Astronomical Society of the Pacific, San Francisco, Calif.

Discover how to link formative assessment to a modeling activity on eclipses to create conceptual change in preparation for the Great American Eclipse in 2017!

3D From Memorization to Modeling—Reconceptualizing Teaching About Cellular Division

(Grades 9–12) *103A, Music City Center*
 Science Focus: LS1.B, CCC2, CCC4, SEP2, SEP6

Robert Wallon (*@rwallon; rwallon2@gmail.com*) and **Barbara Hug** (*bhug@illinois.edu*), University of Illinois at Urbana-Champaign, Champaign

Experience activities that use modeling to teach about cellular division, and leave with ideas for modifying curriculum materials to better meet the NGSS.

Evaluating Mobile Applications for Teaching Science

(Grades P–6) *104C, Music City Center*
 Science Focus: ETS

Krista Adams (*@dr_darth; kadams12@unl.edu*), **Soo-Young Hong** (*shong5@unl.edu*), and **Shannon Feagin** (*snfeagin@gmail.com*), University of Nebraska–Lincoln

Mobile applications are for more than entertainment! Learn how to evaluate mobile applications to effectively engage your students in learning and doing science.

It's Magnetic! Using Mathematics to Enhance Science Learning

(Grades 3–5) *104E, Music City Center*
 Science Focus: PS2.B, CCC2, SEP2, SEP3, SEP4, SEP6, SEP7

Elizabeth Gajdzik (*egajdzik@purdue.edu*), INSPIRE–Purdue University, West Lafayette, Ind.

Experience hands-on mathematics to demonstrate how it can promote deeper science understanding when solving an engineering problem.

Cheap Investigations...Priceless Student Learning
(Grades 9–12) 105A, Music City Center

Science Focus: ESS3.C, LS2.A, LS2.B

Jean Gillespie (jjillespie@hoover.k12.al.us) and **Emily Dunn** (emdunn@hoover.k12.al.us), Spain Park High School, Birmingham, Ala.

Engage in examples of inexpensive, doable hands-on investigations in ecology/environmental science that promote student development of science practices and knowledge.

Inquiry Through Teamwork!

(Grades 4–8) 106B, Music City Center

Science Focus: GEN, SEP

Jennifer Casey, East Hamilton School, Knoxville, Tenn. Through a bit of teamwork you will problem-solve and build various simple hands-on designs without any instruction of HOW to do it. Inquiry at its best!

Modeling the NGSS Way

(Grades K–8) 106C, Music City Center

Science Focus: GEN, SEP2, SEP7

Randy Bell (randy.bell@oregonstate.edu), Oregon State University, Corvallis

Participate in engaging activities designed to clarify and teach scientific modeling to elementary and middle school students. You'll receive free resources and lessons.

Engineering for Kindergartners? You Bet!

(Grades P–1) 110A, Music City Center

Science Focus: ETS

Linda Smith (elementary.science.teacher@gmail.com), Retired Educator, Elmer, N.J.

Yes, kindergartners can master the E in STEM. Engage with us as we complete a variety of engineering projects specifically designed for kindergarten students and the NGSS.

Climate Change Education Inside Out

(Grades 6–12) 201A, Music City Center

Science Focus: ESS2.D, ESS3.C, ESS3.D, LS2.A, LS2.B, LS2.C, SEP3, SEP4, SEP6, SEP7, SEP8

Pat Harcourt (pharcour@usc.edu), MADE CLEAR, Annapolis, Md.

Climate change education works best when it includes classroom and outdoor experiences. I'll share ideas for integrating environmental studies with classroom climate change activities.

Examining the Evidence: Using Data to Pose and Answer Questions Around Earth's Changing Climate

(Grades 8–College) 201B, Music City Center

Science Focus: ESS, SEP4, SEP7, SEP8

Margie Turrin (mkt@ldeo.columbia.edu), Lamont-Doherty Earth Observatory, Palisades, N.Y.

When scientists have questions they turn to data, as should our students. In the last 100 years, sufficient data have been collected to measure warming in Earth's climate.

Using Models and Motion for Teaching DNA and Protein Synthesis

(Grades 9–College) 202B, Music City Center

Science Focus: LS1.A, LS3.B, CCC6, SEP2

Carol Robertson (crobertson.fulton@gmail.com), Fulton High School, Fulton, Mo.

Engage in kinesthetic activities and build inexpensive models to help students learn DNA structure, DNA replication, and protein synthesis while using a 5E (Engage, Explore, Explain, Elaborate, and Evaluate) approach.

Professional Learning Communities: An Interdisciplinary Collaboration Between Secondary Physical Science and CTE Teachers

(Grades 9–12) 202C, Music City Center

Science Focus: LS, PS

Jennifer Butler (@jenwbutler; jbutler08@hotmail.com; jennifer.butler@fwisd.org), Fort Worth (Tex.) ISD

I'll explain how secondary science and Career and Technical Education (CTE) departments can implement learning strategies from an interdisciplinary approach to improve student engagement.

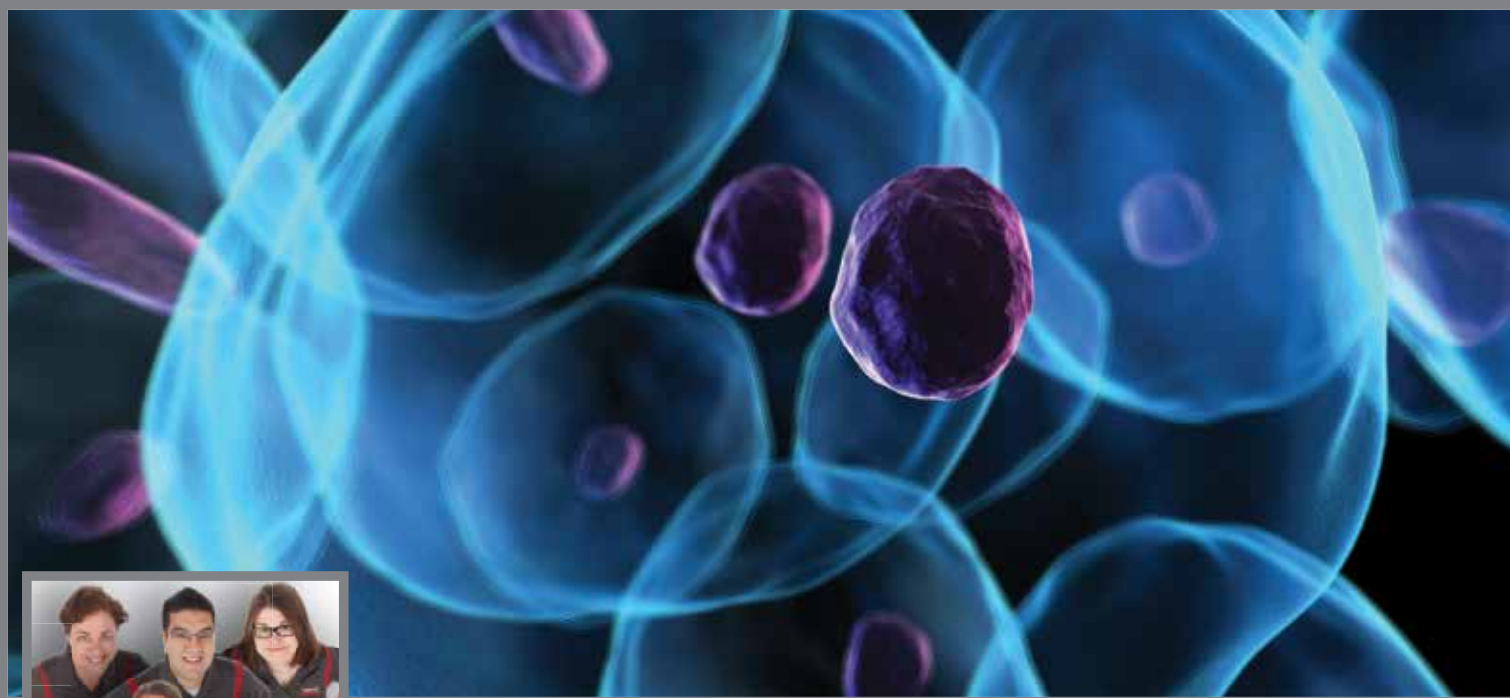
Are You EQUIPped?

(Grades 7–12) 204, Music City Center

Science Focus: GEN, NGSS

Cheryl Heitzman, Adjunct Professor and Grad Student, Nashville, Tenn.

Prepare for NGSS alignment by learning to use the EQUIP science rubric to evaluate your reform-based lesson plans for three-dimensionality. Lesson plans and template provided.



Discover the Ward's Science Plus Us in person when you attend our hands-on interactive workshops. You'll learn new teaching techniques, experience innovative new products, talk science with our in-house experts, and much more.

2016 Ward's NSTA Workshop Schedule

Hands-On Training with the Ward's Science Plus Us Team

All Workshops are Located in Ward's Science Workshop Room #207A

Thursday, March 31

- 8:00 – 9:30 a.m. Artificial Selection, it's unnatural!
- 10:00 – 11:30 a.m. Forces, Integrations and Energy, Oh My
- 12:00 – 1:30 p.m. Introduction to BioBuilder
- 2:00 – 3:30 p.m. Lift Weight and Produce Electricity with the Power of Wind
- 4:00 – 5:30 p.m. CTE: Real life Forensics Brought to the Classroom, Solving the Case

Friday, April 1

- 8:00 – 9:30 a.m. Outbreaking Bad!!
- 10:00 – 11:30 a.m. Apply the Science of Energy, Motion, and Friction
- 12:00 – 1:30 p.m. Fracking the CASE
- 2:00 – 3:30 p.m. Grant Writing: Designing for Dollars
- 4:00 – 5:30 p.m. Chemistry of Wine

Saturday, April 2

- 8:00 – 9:30 a.m. Vampire Chronicles: Sink Your Teeth into Genetics and Blood Typing
- 10:00 – 11:30 a.m. Grant Writing: Pipelines, Partnerships, and Finding Funding
- 12:00 – 1:30 p.m. Let physics show how cars may really drive themselves in the future with the ERGOBOT!
- 2:00 – 3:30 p.m. Elementary Science Activity Jamboree
- 4:00 – 5:30 p.m. Physics of Music

Stop by Booth #142 to see our latest products and enter to win science prizes!

**ward's
science+**

Drill into the Past with the International Ocean Discovery Program

(Grades 3–9) *205A, Music City Center*
Science Focus: ESS1.C, ESS2.A, ESS2.B, ESS2.E, ESS3.D, ETS2.A, CCC1, CCC2, CCC3, CCC7, SEP4, SEP5, SEP7, SEP8

Elizabeth Christiansen (*eacconsulting1@gmail.com*) and **Juliet Crowell** (*crowelljuliet@gmail.com*), International Ocean Discovery Program, College Station, Tex. Dive into science aboard the Research Vessel *JOIDES Resolution*. Travel back through Earth’s history via classroom activities and live broadcasts with scientists of the JR.

Exploring Earth Science: Hands-On NGSS-Based Investigations from the Exploratorium

(Grades 4–College) *207C, Music City Center*
Science Focus: ESS2

Eric Muller (*emuller@exploratorium.edu*), Exploratorium, San Francisco, Calif. Let’s cover the basics of heat transfer via convection and seafloor spreading all with make-and-take, easy-to-do, content-rich “Snack” activities.

From Silos to STEM: Developing Real Thinkers

(Grades 7–12) *208B, Music City Center*
Science Focus: ESS1, ETS, PS1, PS2, PS3, CCC2, CCC3, CCC4, CCC5, CCC6, CCC7, SEP

Amy Scheer, Mary Institute and Saint Louis Country Day School, Saint Louis, Mo.

Experience a STEM course that uses an inquiry-based approach and the book *The Martian* to develop understanding of science and math concepts.

Something Worth Writing About: Using Literacy Techniques to Engage More Students in STEM

(Grades 6–12) *209B, Music City Center*
Science Focus: PS2, SEP1, SEP8

April Lanotte (*april.lanotte@gmail.com*), NASA Langley Research Center, Hampton, Va.

Increase engagement and students’ analytical and communication skills through literacy techniques and your content expertise. Teach students to think, read, and write like a scientist.

Learning About Earth’s Hydrosphere Using STEAM Skills!

(Grades 3–10) *209C, Music City Center*
Science Focus: ESS2.C, ESS3.C, ESS3.D, SEP1, SEP2, SEP3, SEP4, SEP6, SEP8

Judith Lucas-Odom (*@Judith_Odom; judyps23@yahoo.com*), Chester High School, Chester, Pa.

Through the use of STEAM criteria skills, complete hands-on activities to enhance understanding of water processes in our lives.

10:00–10:30 AM Presentations



Using Web-Based Resources to Assist Diverse Learners to Learn Scientific Concepts While Engaging in Science Practices

(Grades 9–College) *101E, Music City Center*
Science Focus: ESS2.D, LS1.A, PS4.A, SEP1, SEP3, SEP4, SEP7, SEP8

Laura Barden-Gabbei (*lm-barden@wiu.edu*), Western Illinois University, Macomb

Jaime Matys, Tinley Park High School, Tinley Park, Ill.

Stephanie Stenger (*@SciLearnCenterNSTA16; stengersm86@gmail.com*), Virginia (Ill.) CUSD #64

Join us for an introduction to a variety of lessons that use web-based resources to help a diverse group of students learn content while engaging in science practices.



Building a Learning Garden While Integrating Literacy and Science

(Grades K–8) *103B, Music City Center*
Science Focus: INF, LS1.A, LS1.B, LS1.D

Marie Dennan (*@TheKitchenComm; @SCSK12Unified; @yourscience04; marie@thekitchencommunity.org*), The University of Memphis, Tenn.

Dedric McGhee (*@TheKitchenComm; @SCSK12Unified; @yourscience04; mcgheed@scsk12.org*), Shelby County Schools, Memphis, Tenn.

Hear how the Kitchen Community in partnership with Shelby County Schools built learning gardens in Memphis, creating experiential learning opportunities connected to curriculum and growing food.

11:00–11:30 AM Presentation

Using Eclipses to Teach the Evolution of Astronomy

(Grades 9–College) 206 A/B, Music City Center

Science Focus: ESS

Katrina Brown (*kwb@pitt.edu*) and **Todd Brown** (*ltbrown@pitt.edu*), University of Pittsburgh at Greensburg, Pa

We will discuss how we use a historical database of national newspapers to discuss the evolution of astronomical concepts, particularly eclipses.



11:00 AM–12 Noon Presentations



NSTA Press® Session: Forensics in Chemistry

(Grades 10–12) 101C, Music City Center

Science Focus: PS, SEP

Angela Codron (*codrona@unit5.org*), Normal West High School, Normal, Ill.

Forensics is the foundation in this yearlong lab series. As students solve the case, the narrative shows the relevance of chemistry. Rubrics that support the NGSS will be provided.

Strengthening K–12 Teachers Through AMS Professional Development Programs

(General) 104A, Music City Center

Science Focus: ESS

Presenter to be announced

Learn how to effectively teach Earth system sciences with help from the AMS’s free graduate courses in weather, ocean, and climate!

Elementary Science Camps

(Grades K–6) 104B, Music City Center

Science Focus: GEN

Frieda Lamprecht (*@aisd_science*; *@AISD_Science*; *flamprec@austinisd.org*), Austin (Tex.) ISD

Kim Hanson (*kim.hanson@austinisd.org*), Langford Elementary School, Austin, Tex.

Pamela Kling (*pamela.kling@austinisd.org*), Cowan Elementary School, Austin, Tex.

Experience how Elementary Science Camps can transform low-performing students into engaged, confident scientists. Ideas for implementation in your classroom, school, or district are provided.

How to Scaffold Scientific Literacy for ELLs

(Grades 6–9) 106C, Music City Center

Science Focus: GEN

Tanya Warren (*tanya.warren@fwisd.org*), International Newcomer Academy, Fort Worth, Tex.

Jingjing Ma (*winsuncoco@gmail.com*), Texas Christian University, Fort Worth

The International Newcomer Academy in Fort Worth has been teaching English language learners in an urban district for more than 21 years. Literacy, both in English and in science, is a major focus of the instruction. Hear how INA has designed lessons that incorporate rigorous science practice while building scientific literacy for newcomer ELLs.

What Constitutes a STEAM Effective Practice? Learn Findings from Research Conducted by a National STEAM Collaborative

(Grades K–12) 108, Music City Center

Science Focus: GEN, NGSS

Lucinda Presley (*@LucindaPresley*; *lucinda.presley@gmail.com*), ICEE Success Foundation, Palestine, Tex.

Learn what makes a STEAM effective practice, including national research results and examples. Research conducted by a consortium of leading national institutions, including NSTA.

Geospatial Technology and Its Applications

(Grades 10–12) 109, Music City Center

Science Focus: ESS, ETS, CCC3, CCC4, CCC7, SEP5

Pia van Benthem (*pvanbenthem@ucdavis.edu*), University of California, Davis

Science and applications of Geographic Information Systems are continuously used in daily lives, e.g. navigation software. The presentation shows lesson plans using free GIS software.

How STEM Career Interest Changes in High School

(Grades 9–College)

201A, Music City Center

Science Focus: GEN, SEP4

Philip Sadler (psadler@cfa.harvard.edu) and **Gerhard Sonnert** (gsonnert@cfa.harvard.edu), Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass.

We will present results of a large-scale national study about changes in students' STEM career interest during high school, with a particular focus on gender differences.

Integrating Digital Games into Instruction to Address Crosscutting Concepts

(Grades 6–8)

205B, Music City Center

Science Focus: PS3, CCC

Marian Pasquale (mpasquale@edc.org), EDC Center for Children and Technology, New York, N.Y.

Get introduced to evidence-based instructional strategies that can help connect digital game play to students' further exploration of challenging science concepts.

Bring the Science of Cars into the Classroom Basic

(Grades 8–12)

207A, Music City Center

Science Focus: ETS, CCC, SEP2, SEP6

Andrew Nydam (andrewnydam@hotmail.com), Polymer Ambassador, Olympia, Wash.

Students love cars but dislike science? Here are some lessons using the car to teach major science concepts. Yes, even if you are mechanically challenged!

The Science of Natural Disasters: A High School Elective

(Grades 6–12)

207B, Music City Center

Science Focus: GEN, SEP1, SEP2, SEP6

Scott Shoup, The McCallie School, Chattanooga, Tenn.

Natural disasters impact millions around the globe annually and provide an excellent medium for high school seniors to review and apply science. Hear about my experiences teaching a science of natural disasters elective to high school seniors using factual novels and a framework of investigation, prevention, mitigation, and response.

Climate Change Research on the Arctic Tundra: Lessons and Labs from Teachers at Toolik Field Station in Alaska

(Grades 6–12)

207D, Music City Center

Science Focus: ESS, ETS, LS, SEP5

Regina Brinker ([@brinkerscience](https://twitter.com/brinkerscience); r.brinker@sbcglobal.net), Granada High School, Livermore, Calif.

Bruce Taterka (btaterka@gmail.com), West Morris Mendham High School, Mendham, N.J.

Based on fieldwork on the Alaskan tundra, we will share NGSS-focused lessons and labs for biology, Earth, climate science, and engineering at middle school and high school levels.

Making the Science Curriculum Culturally Relevant

(Grades 4–9)

208A, Music City Center

Science Focus: GEN

Michael Clinchot and **Johanna Mendillo**, John D. O'Bryant School of Mathematics and Science, Boston, Mass.

Erin Hashimoto-Martell (ehashimoto@bostonpublicschools.org), Dearborn STEM Academy, Boston, Mass.

We will describe the process of how we adapted a nationally distributed curriculum to be culturally relevant to the students in our classes.

Science Lab Renovations: Working Strategically with Architects to Create 21st-Century Labs

(Grades 6–College)

209A, Music City Center

Science Focus: GEN

Steve Wood (swood@d125.org), Adlai E. Stevenson High School, Lincolnshire, Ill.

Thoughtful lab renovations require collaboration between teachers, administrators, and architects. I'll highlight specific design elements, lessons we learned, and ways to maximize stakeholders' expertise.

Planning in 3-D: Preparing Lessons for Three-Dimensional Learning

(Grades 9–12)

209B, Music City Center

Science Focus: GEN, NGSS

Jaimie Foulk, Camdenton, Mo.

Learn ways to select, design, and evaluate lessons that integrate the three dimensions of the NGSS, and create authentic learning experiences for your students.

Science Inspires

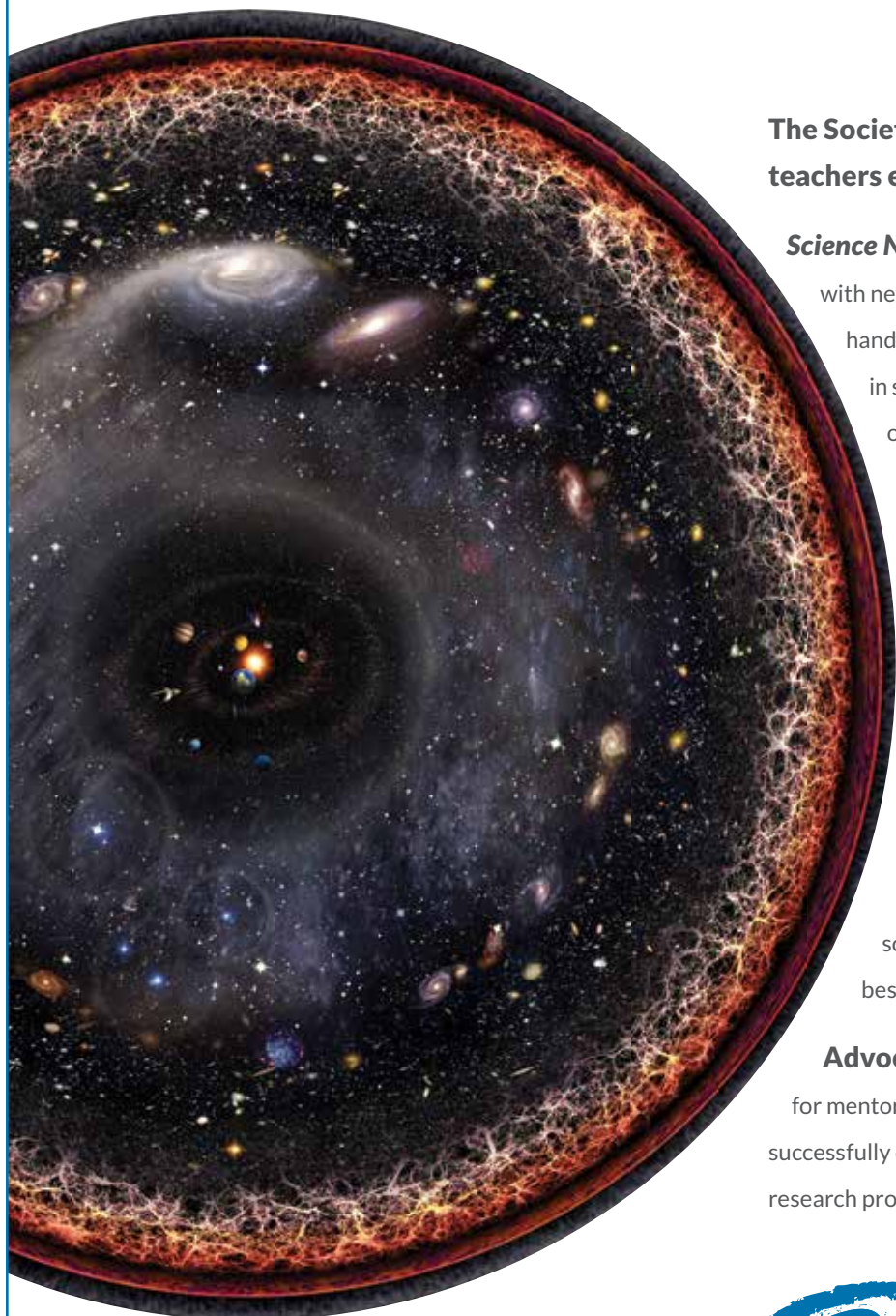
The Society for Science & the Public helps teachers educate and inspire students.

Science News for Students—our free website with news stories, features and ideas for hands-on activities that connect the latest in scientific research to in- and out-of-classroom learning.

Science News in High School—our award-winning magazine delivered to your classroom together with an online educator guide.

Acclaimed education competitions—Intel Science Talent Search (STS), the Intel International Science and Engineering Fair (ISEF), and the Broadcom MASTERS recognize young scientists and teach them how to conduct best-of-class, inquiry-based scientific research.

Advocate Grants—stipends and support for mentors who help under-represented students successfully enter their science or engineering research projects in scientific competitions.



UNIVERSAL MAP This diagram, made up of stitched together NASA imagery, is essentially a map of the observable universe. The solar system is at center. The scale changes as you move outward so that the distances depicted toward the edge of the circle are enormous.
Unmismoobjetivo/Wikimedia Commons (CC BY-SA 3.0)



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INF **UFOs, Crime Scenes, Mysteries, and More! Family Science Night in Action!**

(General)

209C, Music City Center

Science Focus: INF, SEP

Caleb Cheung (caleb.cheung@ousd.k12.ca.us), Oakland (Calif.) Unified School District

Get inspired! Design your own Family Science Night from start to finish. Involve hundreds of students, family members, and teachers... includes detailed notes and variations.

Ocean Robotics in a Landlocked 1:1 STEM Classroom
(Grades 6–12)

Davidson A2/3, Music City Center

Science Focus: ETS2.A, SEP2

Kirk Beckendorf (kirkbeckendorf@gmail.com) and **Miller Callaway** (@millercallaway; miller_callaway@webbschool.org), Webb School of Knoxville, Tenn.

Join co-teachers as they describe the ups and downs of middle school students developing underwater robots, ocean drifters, and connecting with ocean explorers on the Exploration Vessel *Nautilus*.

11:00 AM–12 Noon Hands-On Workshops

3D **Orchestrating a Scientific Symphony with the Three Dimensions of the NGSS**

(Grades 6–12)

103A, Music City Center

Science Focus: LS1.C, LS2.A, LS2.B, CCC, SEP

Mindy Pearson (@ScienceMindy; mindy.pearson@sdhc.k12.fl.us) and **Michele Detwiler** (michele.detwiler@sdhc.k12.fl.us), Hillsborough County Public Schools, Tampa, Fla.

Explore integrating the NGSS disciplinary core ideas, cross-cutting concepts, and science and engineering practices through an exemplar lesson on matter and energy in organisms and ecosystems.

Energize Your Classroom While Teaching Tough Science Concepts

(Grades 5–12)

103B, Music City Center

Science Focus: PS

Linda Fonner (lfonner@k12.wv.us), New Martinsville Elementary School, New Martinsville, W.Va.

Hands-on activities explore the forms of energy: motion, heat, light, sound, electricity, and energy transformations. Gain confidence teaching energy concepts and receive free materials to energize your classroom!

Data Literacy for Science Teachers: Understanding and Integrating CCSS Mathematics Data Standards to Strengthen Your Science Curriculum

(Grades 6–9)

103C, Music City Center

Science Focus: GEN, SEP1, SEP3, SEP4, SEP5, SEP8

Elizabeth Novak (enovak@ccls.info), Cape Cod Lighthouse Charter School, East Harwich, Mass.

Practice using statistical methods that students use in CCSS *Math* classes. See examples of how integrating these standards into science classes can strengthen your science curriculum.

Rockin' Earth Science: Weathering and Erosion

(Grades 3–6)

104C, Music City Center

Science Focus: ESS2.A

Barbara Brightman (barbara.brightman@sdhc.k12.fl.us), Hillsborough County Public Schools, Tampa, Fla.

Trudy Johnson (cherokeel@mailmt.com), Independent Educational Consultant, Myakka City, Fla.

Come participate in inquiry-based hands-on investigations to experience and understand weathering and erosion in a teacher-friendly, student-friendly way.

Cole's Aquarium: Intentional Integration of Grade 5 Science and Math

(Grade 5)

104D, Music City Center

Science Focus: LS2.A, CCC1, SEP5

Donna Barrett (@donna-science; williamsd17@fulton-schools.org) and **Denise Huddleston** (@denisehuddle; denise.huddleston@mresa.org), Metro RESA, Smyrna, Ga.

Cole is planning an aquarium and needs your help! He needs to calculate the volume, select a variety of diverse organisms, and create a budget.

Managing Moving Molecules: A Hands-On Modeling Approach to Photosynthesis and Cellular Respiration

(Grades 4–8)

104E, Music City Center

Science Focus: LS1.C, SEP2

Shumit DasGupta (sdasgupta@calacademy.org) and **Clea Matson** (cmatson@calacademy.org), California Academy of Sciences, San Francisco

Join us to explore a kinesthetic approach to photosynthesis and cellular respiration through the lens of the NGSS practice of developing and using models.

INF Using the Outdoors to Teach Grade 3 Students About Relationships Within an Ecosystem

(Grades 2–4) *105A, Music City Center*
 Science Focus: INF, NGSS

Jamie Garaventa (jamie@sierranevadajourneys.org), Sierra Nevada Journeys, Reno, Nev.

Explore ways to use real-world experiences and three-dimensional learning to teach elementary students about the interdependent relationships in ecosystems.

INF Aerospace Adventurers: Launching an After-School Aeronautics and Space Education Program

(Grades 3–8) *105B, Music City Center*
 Science Focus: ESS, ETS, INF

Stuart Sharack (sharack@aol.com), Aviation Career Education (ACE) Academy Program, Waterford, Conn.

Alex Rode (@arode_lps; arode@ladyard.net), Ledyard Center School, Ledyard, Conn.

Take student learning to new heights. Start your own after-school aerospace program. Find out how to design and create a STEAM/NGSS environment to challenge and inspire students.

Designing Activities for STEM: A Simple Solution for Bundling the CCSS and NGSS

(Grades P–8) *110A, Music City Center*
 Science Focus: GEN, NGSS

Keith Palz, Distinctive Schools, Chicago, Ill.

Come experience the combination of design thinking and standards bundling as they merge to create interdisciplinary Project-Based Learning activities while drastically increasing collaboration within a team.

Duck, Duck, Goose by the Numbers

(Grades 5–8/College) *201B, Music City Center*
 Science Focus: ETS, LS

Rebecca Robichaux-Davis (rrr102@msstate.edu), **Brian Davis**, and **Margaret Pope** (@marpope; mpope@colled.msstate.edu), and Mississippi State University, Mississippi State, Miss.

Come engage in integrated activities focusing on the annual waterfowl cycle. Participants will solve migration and nesting problems and construct a model wood duck box.

Biomagnification in Ocean Food Webs: You Are What You Eat

(Grades 9–12) *202A, Music City Center*
 Science Focus: LS2.C, LS4.D, CCC2, SEP2

Elizabeth Callaghan ([@bethofall](https://twitter.com/bethofall); bcallaghan@mbayaq.org), Monterey Bay Aquarium, Monterey, Calif.

Explore the difference between bioaccumulation and biomagnification and learn about a consequence that plastic has on our ocean food web through an engaging simulation activity.

Science and Engineering Practices in the Chemistry Classroom

(Grades 9–College) *202B, Music City Center*
 Science Focus: PS, SEP

Michael Mury, American Chemical Society, Washington, D.C.

With the NGSS, incorporation of science and engineering practices is vital. Come learn how to integrate these practices into lessons.

Increasing Student Critical Thinking in Evaluating the Credibility of an Information Source

(Grades 9–College) *202C, Music City Center*
 Science Focus: GEN, SEP1, SEP7, SEP8

Jonathan Fowler ([@FowlerSci](https://twitter.com/FowlerSci); fowlerjl@stjohns.edu), St. John's University, Jamaica, N.Y.

Strengthening critical thinking in an era of hyper-accessible information relies on using credible information sources. Strategies for classroom implementation of these skills will be presented

Using the Science Writing Heuristic as a Method for Implementing Three-Dimensional Learning

(Grades 6–12) *204, Music City Center*
 Science Focus: GEN, CCC, SEP

Jennifer Panczyszyn and **Heather Witt**, K.O. Knudson Middle School, Las Vegas, Nev.

Incorporate three-dimensional learning using the Science Writing Heuristic (SWH), a research-based method of teaching science through inquiry. SWH lessons allow students to develop their initial thoughts, build on them through lab experiences, and challenge them through expert readings. Engage in an SWH lesson, view student work, and begin to develop your own SWH.

Place-Based Engineering

(Grades K–8)

205A, Music City Center

Science Focus: ETS, SEP

Robert Strong (robert@smartcenter.org) and **Elizabeth Strong** (libby@smartcenter.org), SMART Center, Wheeling, W.Va.

Engage in engineering activities with examples found in your own backyards! Historical structures, new technologies, and more open the world of engineering to your students.

Explore Rocks Part 2: Sedimentary and Metamorphic Rocks

(Grades 3–College)

207C, Music City Center

Science Focus: ESS2.A, CCC1, CCC5, CCC6, SEP3, SEP8

Davida Buehler (dbuehler@geosociety.org), The Geological Society of America, Boulder, Colo.

Come see the numerous inquiry-based activities for rocks that you can easily incorporate into your rock unit. They're sure to engage your students!

11:30 AM–12 Noon Presentation

Climate Change: Using Story Maps to Explore Complex Spatial Concepts

(Grades 9–College)

206 A/B, Music City Center

Science Focus: ESS

Meredith McAllister (mlmcalli@butler.edu), Butler University, Indianapolis, Ind.

Tina Harris (taharris79@yahoo.com), Marion High School, Marion, Ind.

Geospatial tools, including mapping online, promotes interdisciplinary learning and changes the way students learn to reason about and interpret spatial data related to climate change.





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5TH ANNUAL

STEM

SCIENCE TECHNOLOGY ENGINEERING MATHEMATICS

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Denver, CO

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Come prepared to learn tactics that work, build your professional learning network, connect with effective outreach programs and partnerships, discover new resources, and build a strong curriculum.

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#STEMforum

NSTA National
Science
Teachers
Association

Meetings and Social Functions Index

Saturday, April 2

APAST Breakfast Meeting

By Invitation Only

Broadway K, Omni 7:00–9:00 AM

NSTA Past Presidents' Breakfast

By Invitation Only

Legends A, Omni 7:30–8:15 AM

Science Matters State Coordinators Meeting

By Invitation Only

Music Row 4, Omni 8:00–9:30 AM

Past Presidents Advisory Board Meeting

Legends A, Omni 8:15–9:15 AM

Shell Breakfast Meeting

By Invitation Only

Ryman One, Renaissance 8:30–10:00 AM

Teaming Up for STEM: Team Discussion and Planning Meeting

By Invitation Only

Grand Blrm. A1, Music City Center 9:00–11:00 AM

AMSE Board Meeting

By Invitation Only

Boardroom 5, Hyatt 9:00 AM–12 Noon

NSTA International Lounge

Mockingbird 1, Omni 9:00 AM–5:00 PM

NSTA Committee, Advisory Board, and Panel Chairs Meeting

By Invitation Only

Mockingbird 2, Omni 9:30–10:30 AM

AMSE General Membership Meeting

Broadway K, Omni 10:30 AM–12:30 PM

NSTA Council Roundtable

By Invitation Only

Legends A, Omni 2:00–4:00 PM

CESI Board Meeting

By Invitation Only

Gibson Boardroom, Omni 3:00–6:00 PM

Teacher Scientist Partnerships Reception

Broadway A, Omni 4:30–6:00 PM

NESTA Annual Membership Meeting

Davidson B, Music City Center 5:00–6:00 PM

LinkEngineering Reception

Legends F, Omni 6:30–7:30 PM

Boot Scootin' Boogie!

Off-site, Frontier Room 8:00–10:00 PM



—Photo courtesy of Jacob Slaton

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*MCC stands for Music City Center

3D Molecular Designs (Booth #516)

Saturday, Apr 2 12 Noon–1:30 PM 214, MCC Constructing and Crossing Cell Membranes (p. 55)

Activate Learning (Booth #1204)

Saturday, Apr 2 8:00–9:30 AM 214, MCC Discourse Tools for Equitable and Rigorous Talk (p. 27)

Advancement Courses (Booth #1351)

Saturday, Apr 2 10:00–11:30 AM 207B, MCC Using Fables to Scaffold Inquiry-Based STEM Instruction and the Engineering Design Process (p. 40)

Albert Einstein Distinguished Educator Fellowship (Booth #1535)

Saturday, Apr 2 8:00–9:30 AM 107B, MCC Albert Einstein Distinguished Educator Fellowship Program: Exciting Opportunities for K–12 STEM Educators to Influence Federal Programs and Policy in Washington, D.C. (p. 23)

AquaPhoenix Education (Booth #1153)

Saturday, Apr 2 8:00–9:30 AM 209C, MCC Implementing Three-Dimensional Learning (p. 26)

Battle Creek Area Mathematics and Science Center (Booth #1143)

Saturday, Apr 2 8:00–9:30 AM 110B, MCC Cereal City Science: Going Great Lengths Toward the NGSS (p. 24)

Bedford, Freeman, & Worth Publishers (Booth #744)

Saturday, Apr 2 8:00–9:30 AM 210, MCC *Living By Chemistry*: Pass the Proton—Acids and Bases (p. 26)

Bio-Rad Laboratories, Inc. (Booth #152)

Saturday, Apr 2 8:00–9:30 AM 208A, MCC Get that Grant Money! (p. 26)
Saturday, Apr 2 10:00–11:30 AM 208A, MCC NGSS in the High School Biology Classroom (p. 40)

BIOZONE International Ltd. (Booth #840)

Saturday, Apr 2 10:00–11:30 AM 202B, MCC Earth and Space Sciences for NGSS: A New Program (Grades 9–12) (p. 39)

Carolina Biological Supply Co. (Booth #118)

Saturday, Apr 2 8:00–9:30 AM 205B, MCC Interactive Case Studies: Supplemental Software to Improve Critical Thinking in the Biology Classroom (p. 24)

Celestron (Booth #1218)

Saturday, Apr 2 10:00–11:30 AM 108, MCC Stretch Your Legs for Science! (p. 38)

Chibitronics (Booth #1344)

Saturday, Apr 2	8:00–9:30 AM	208B, MCC	Circuits as Crayons: Crafting Interactive Circuits with Circuit Stickers (p. 26)
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Disney Youth Programs (Booth #844)

Saturday, Apr 2	10:00–11:30 AM	212, MCC	A Peek Behind the Curtain: Disney Parks Approach to Physics and Energy (p. 42)
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Educational Innovations, Inc. (Booths #1026/ #1126)

Saturday, Apr 2	10:00–11:30 AM	202A, MCC	3-2-1 Blast Off! (p. 39)
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ETA hand2mind (Booth #408)

Saturday, Apr 2	12 Noon–1:30 PM	208B, MCC	From “Science Is for Others” to “Science Is for Me”—Hands-On Modules to Engage All Students (p. 54)
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Flinn Scientific, Inc. (Booth #333)

Saturday, Apr 2	10:00–11:30 AM	209A, MCC	Enhance Your AP Chemistry Course with POGIL™ Activities (p. 41) Hands-On Integrated Science Activities for Middle School from Flinn Scientific (p. 54)
Saturday, Apr 2	12 Noon–1:30 PM	209A, MCC	

G-Biosciences (Booth #1005)

Saturday, Apr 2	8:00–9:30 AM	212, MCC	Proteins Are the Cash of Biotech (p. 27)
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Houghton Mifflin Harcourt (Booth #1240)

Saturday, Apr 2	8:00–9:30 AM	202B, MCC	Self-Propelled Vehicles! Constructing Engaging Engineering Experiences Using NGSS Performance Expectations (p. 24) Sparkling Interest with Chemistry (p. 54) Wind Turbines and Fruit Batteries! Constructing Engaging Engineering Experiences Using NGSS Performance Expectations (p. 74)
Saturday, Apr 2	12 Noon–1:30 PM	202B, MCC	
Saturday, Apr 2	2:00–3:30 PM	202B, MCC	

Inq-ITS (Booth #1336)

Saturday, Apr 2	8:00–9:30 AM	202C, MCC	Tracking Student Growth in Science Practices (p. 24)
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Kendall Hunt Publishing Co. (Booth #515)

Saturday, Apr 2	8:00–9:30 AM	206 A/B, MCC	Forensic Science for High School, 3rd Edition (p. 25)
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LAB-AIDS®, Inc. (Booth #915)

Saturday, Apr 2	8:00–9:30 AM	205C, MCC	Convection Currents and Plate Motion (p. 24)
Saturday, Apr 2	10:00–11:30 AM	205C, MCC	Waves (p. 40)

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LaMotte Co. (Booth #1015)

Saturday, Apr 2	8:00–9:30 AM	107A, MCC	AP Environmental: Using Your Stream to Teach STEM-Based Skills (p. 23)
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LEGO Education (Booths #341 / #358)

Saturday, Apr 2	10:00–11:30 AM	211, MCC	Make Science Come to Life (p. 42)
Saturday, Apr 2	12 Noon–1:30 PM	211, MCC	Make Science Come to Life (p. 55)
Saturday, Apr 2	2:00–3:30 PM	211, MCC	Make Science Come to Life (p. 75)

McDowell Farm School (Booth #948)

Saturday, Apr 2	10:00–11:30 AM	110B, MCC	McDowell Farm School: Integrating Best Practices in a Scientific Garden (p. 39)
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McGraw-Hill Education (Booth #1345)

Saturday, Apr 2	8:00–9:30 AM	201B, MCC	Engagement Unlocked! Using Learning Games for STEM (p. 24)
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Measured Progress (Booth #304)

Saturday, Apr 2	8:00–9:30 AM	209B, MCC	Engage with NGSS Using STEM Gauge™ (p. 26)
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Microsoft (Booth #1335)

Saturday, Apr 2	8:00–9:30 AM	110A, MCC	Development of a Science Maker Kit for Inquiry-Based Teaching: Ideation and Feedback (p. 23)
Saturday, Apr 2	10:00–11:30 AM	110A, MCC	Understanding the Community Impact of Environmental Hazards: Developing a Project-Based Learning Challenge from Start to Finish Using Microsoft Tools (p. 38)
Saturday, Apr 2	1:00–2:30 PM	110A, MCC	Getting to Know the Creative Coding Through Games and Apps (CCGA) Course Content (p. 65)
Saturday, Apr 2	3:00–4:30 PM	110A, MCC	The Differentiated Classroom in One Package: Teaching Science Inquiry to Modern Learners Using Microsoft Surface and Apps (p. 77)

MSOE Center for BioMolecular Modeling (Booth #518)

Saturday, Apr 2	10:00–11:30 AM	214, MCC	Let's Get Helical (p. 42)
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Nano-Link: Center for Nanotechnology Education (Booth #1354)

Saturday, Apr 2	12 Noon–1:30 PM	201B, MCC	Learning Through Hands-On Activities (p. 53)
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National Agriculture in the Classroom (Booth #1113)

Saturday, Apr 2	8:00–9:30 AM	108, MCC	Contextualizing Science Literacy with Agriculture (p. 23)
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National Geographic Education (Booths #749)

Saturday, Apr 2	10:00–11:30 AM	208B, MCC	National Geographic Educator Certification Program (p. 41)
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NOAA Ocean Service (Booth #1423)

Saturday, Apr 2	9:00–10:30 AM	201A, MCC	Climate Changes Series I: Polar Popsicles—Life in the Ice (p. 30)
Saturday, Apr 2	10:45–11:45 AM	201A, MCC	Climate Change Series II: Bringing Climate Change Closer to Home: U.S. Forest Service Climate Change Education Resources (p. 43)
Saturday, Apr 2	12:15–1:15 PM	201A, MCC	Climate Change Series III: ClimateChangeLIVE: Engage Your Students in Learning and Being Part of the Climate Solution! (p. 56)
Saturday, Apr 2	1:30–2:30 PM	201A, MCC	Climate Change Series IV: NOAA Climate Stewards (p. 66)
Saturday, Apr 2	2:45–3:45 PM	201A, MCC	Climate Change Series V: Use NGSS as a Pathway to Climate Literacy (p. 77)
Saturday, Apr 2	4:00–5:00 PM	201A, MCC	Climate Change Series VI: Climate Games and Simulations (p. 84)

Northrop Grumman Foundation (Booth #442)

Saturday, Apr 2	2:00–3:30 PM	208B, MCC	ECO Classroom: Free Experiential Learning in the Rainforests of Costa Rica (p. 74)
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Perimeter Institute for Theoretical Physics (Booth #1219)

Saturday, Apr 2	10:00–11:30 AM	107B, MCC	The Expanding Universe (p. 38)
Saturday, Apr 2	12 Noon–1:30 PM	107B, MCC	Spicing Up Classical Physics Using Modern Examples (p. 53)

PlayMada Games (Booth #1434)

Saturday, Apr 2	10:00–11:30 AM	206 A/B, MCC	Collisions™: Reconceptualizing Chemistry Through Gameplay (p. 40)
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SAE International—A World In Motion Program (Booth #609)

Saturday, Apr 2	12 Noon–1:30 PM	209C, MCC	SAE Middle School Educational Offerings (p. 54)
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Shape of Life (Booth #1121)

Saturday, Apr 2	10:00–11:30 AM	209C, MCC	The REAL Story of the Animal Kingdom on Planet Earth (p. 42)
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Simulation Curriculum Corp. (Booth #834)

Saturday, Apr 2	10:00–11:30 AM	209B, MCC	Life Cycle of Stars: From Birth to Catastrophic Death (p. 42)
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Society for Neuroscience (Booth #301)

Saturday, Apr 2	10:00–11:30 AM	201B, MCC	The Truth Behind Brain-Based Learning (p. 39)
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Stratasys (Booth #300)

Saturday, Apr 2	10:00–11:30 AM	204, MCC	Implementing 3D Printing Across the K–12 Curriculum (p. 39)
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Teachers Curriculum Institute (Booth #256)

Saturday, Apr 2	10:00–11:30 AM	107A, MCC	Modeling Earth, Sun, and Other Stars with Bring Science Alive! (p. 38)
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Texas Instruments (Booth #108)

Saturday, Apr 2	8:00–9:30 AM	207B, MCC	Zombie Apocalypse! (p. 25)
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U.S. Fish and Wildlife Service (Booth #1316)

Saturday, Apr 2	10:00–11:30 AM	210, MCC	Engaging Your Students Through the U.S. Fish & Wildlife Service's Conservation Connect (p. 42)
Saturday, Apr 2	12 Noon–1:30 PM	210, MCC	Citizen Science—From Classroom to Field with the U.S. Fish and Wildlife Service (p. 54)

Van Andel Education Institute Science Academy (Booth #706)

Saturday, Apr 2	10:00–11:30 AM	202C, MCC	No Great Science Student (NGSS) Left Behind with NexGen Inquiry™ (p. 39)
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Vernier Software & Technology (Booth #134)

Saturday, Apr 2	8:00–9:30 AM	207D, MCC	Integrating Chromebook with Vernier Technology (p. 26)
Saturday, Apr 2	8:00–9:30 AM	207C, MCC	Chemistry with Vernier (p. 26)
Saturday, Apr 2	10:00–11:30 AM	207C, MCC	Inquiry-Based Chemistry with Vernier (p. 40)
Saturday, Apr 2	10:00–11:30 AM	207D, MCC	Elementary Science with Vernier (p. 40)
Saturday, Apr 2	12 Noon–1:30 PM	207C, MCC	Biology with Vernier (p. 54)
Saturday, Apr 2	12 Noon–1:30 PM	207D, MCC	Physics with Vernier (p. 54)
Saturday, Apr 2	2:00–3:30 PM	207C, MCC	Human Physiology with Vernier (p. 74)
Saturday, Apr 2	2:00–3:30 PM	207D, MCC	Introductory Engineering Design Projects with Vernier (p. 74)

Ward's Science (Booth #142)

Saturday, Apr 2	8:00–9:30 AM	207A, MCC	Vampire Chronicles: Sink Your Teeth into Genetics and Blood Typing (p. 25)
Saturday, Apr 2	10:00–11:30 AM	207A, MCC	Grant Writing: Pipelines, Partnerships, and Finding Funding (p. 40)
Saturday, Apr 2	12 Noon–1:30 PM	207A, MCC	Let Motion Show How Cars May Really Drive Themselves in the Future with the ERGOBOT! (p. 54)
Saturday, Apr 2	2:00–3:30 PM	207A, MCC	Elementary Science Activity Jamboree (p. 74)
Saturday, Apr 2	4:00–5:30 PM	207A, MCC	Physics of Music (p. 84)

*MCC stands for Music City Center

Earth and Space Science: Saturday

8:00–9:00 AM	4–6	104C, MCC	To the Moon and Back (p. 20)
8:00–9:00 AM	K–5	Music Row 5, Omni	Earthquake! Integrating CCSS and NGSS in the Elementary Science and Engineering Classroom (p. 22)
8:00–9:00 AM	K–8	104E, MCC	Looking Up: Make Satellite Observations by Matching What a Satellite Sees! (p. 20)
8:00–9:00 AM	5–8	Broadway C, Omni	Math, Science, and ELA Team Up for an Oil Spill (p. 21)
8:00–9:00 AM	K–12	Legends G, Omni	Science Explorations with Deaf and Hard of Hearing Students (p. 22)
8:00–9:00 AM	6–8	106C, MCC	Space System for Middle School: How to Use an Orrery to Teach Earth-Sun-Moon Interactions (p. 21)
8:00–9:00 AM	6–8	Broadway D, Omni	At the Core of STEM: A Tale of Integrated Lessons for Middle School Students (p. 22)
8:00–9:00 AM	K–12	Electric, Omni	Learning about Earth Across the Curriculum: Mapping Connections Between NGSS and Social Studies Across K–12 (p. 19)
8:00–9:00 AM	4–10	103C, MCC	Art and the Cosmic Connection (p. 20)
8:00–9:00 AM	6–C	103B, MCC	Students and Teachers Investigating Climate Change and Remote Sensing (p. 17)
8:00–9:30 AM	6–8	202C, MCC	Tracking Student Growth in Science Practices (p. 24)
8:00–9:30 AM	6–8	205C, MCC	Convection Currents and Plate Motion (p. 24)
8:00–9:30 AM	12	107A, MCC	AP Environmental: Using Your Stream to Teach STEM-Based Skills (p. 23)
8:30–9:00 AM	P–C	Acoustic, Omni	Smithsonian National Air and Space Museum Exhibits as Sources for STEM Investigations (p. 28)
9:00–10:30 AM	6–12	201A, MCC	Climate Changes Series I: Polar Popsicles—Life in the Ice (p. 30)
9:30–10:30 AM	*–C	101E, MCC	Students Answer Sustainable Energy Research Questions with Current Science and Engineering Data (p. 35)
9:30–10:30 AM	7–C	105A, MCC	Black Holes Suck! (p. 35)
9:30–10:30 AM	P–C	Grand Blrm. C2, MCC	Paul F-Brandwein Lecture: Love: The Four-Letter Word That Science Forgot (p. 31)
9:30–10:30 AM	6–8	106C, MCC	Using a Web-based Graphing Tool to Analyze and Interpret Local and National Weather and Climate Data for Patterns and Change (p. 35)
9:30–10:30 AM	G	104A, MCC	Using the 2017 U.S. Total Solar Eclipse to Promote Educational Outreach (p. 32)
9:30–10:30 AM	3–C	Electric, Omni	ICARUS (p. 34)
9:30–10:30 AM	5–9	101C, MCC	NSTA Press® Session: Solar Astronomy Curriculum Resource That Meets the NGSS = Getting Ready for the All-American Eclipse (p. 35)
9:30–10:30 AM	K–C	Davidson B, MCC	National Earth Science Teachers Association (NESTA) Shares: Astronomy Share-a-Thon (p. 35)
9:30–11:00 AM	P–C	Davidson C, MCC	NSTA Aerospace Share-a-Thon (p. 37)
10:00–11:30 AM	6–12	209B, MCC	Life Cycle of Stars: From Birth to Catastrophic Death (p. 42)
10:00–11:30 AM	K–8	107A, MCC	Modeling Earth, Sun, and Other Stars with Bring Science Alive! (p. 38)
10:00–11:30 AM	9–12	202B, MCC	Earth and Space Sciences for NGSS: A New Program (Grades 9–12) (p. 39)
10:00–11:30 AM	7–12	110A, MCC	Understanding the Community Impact of Environmental Hazards: Developing a Project-Based Learning Challenge from Start to Finish Using Microsoft Tools (p. 38)
10:00–11:30 AM	9	107B, MCC	The Expanding Universe (p. 38)
10:00–11:30 AM	K–12	108, MCC	Stretch Your Legs for Science! (p. 38)
10:45–11:45 AM	6–12	201A, MCC	Climate Change Series II: Bringing Climate Change Closer to Home: U.S. Forest Service Climate Change Education Resources (p. 43)
11:00–11:30 AM	5–8	Broadway C, Omni	Meet Me in the Middle Session: More Engineering to the Standards (p. 45)
11:00AM–12 Noon	9–12	Broadway G, Omni	Earthquakes: From Paper to ArcGIS (p. 46)
11:00AM–12 Noon	5–C	Center Blrm., Renaissance	Academic Discussions That Promote Science Talk (p. 52)
11:00AM–12 Noon	1–8	Davidson A2/3, MCC	Using TALES to Enhance Learning in an After-School Program (p. 46)
11:00AM–12 Noon	6–8	106C, MCC	Ocean Plastic Pollution: Examining Issues and Solutions in a Middle School Classroom (p. 50)
11:00AM–12 Noon	6–12	103A, MCC	Revamping Our Best Earthquake Lessons with Argument-Driven Inquiry to Better Target the NGSS (p. 49)

Schedule at a Glance Earth and Space Science

11:00AM–12 Noon	P–C	Grand Blrm. C2, MCC	American Geophysical Union (AGU) Lecture: Curiosity’s Adventures in Gale Crater, Mars (p. 45)
12 Noon–1:30 PM	6–8	209A, MCC	Hands-On Integrated Science Activities for Middle School from Flinn Scientific (p. 54)
12 Noon–1:30 PM	5–C	214, MCC	Constructing and Crossing Cell Membranes (p. 55)
12:15–1:15 PM	6–12	201A, MCC	Climate Change Series III: ClimateChangeLIVE: Engage Your Students in Learning and Being Part of the Climate Solution! (p. 56)
12:30–1:30 PM	6–C	Legends F, Omni	Modeling in STEM Education with Examples from Climate Modeling (p. 63)
12:30–1:30 PM	P–12	101 A/B, MCC	NASA Aeronautics 101: Over a Century of Flight (p. 61)
12:30–1:30 PM	6–C	Davidson B, MCC	NESTA and CIESIN Share: Exploring a Compendium of Online Resources for Teaching Earth Science (p. 60)
12:30–1:30 PM	P–5	105A, MCC	Planting a School Garden on a Shoestring Budget (p. 62)
12:30–1:30 PM	P–8	Music Row 2, Omni	AMSE Session: Differentiating Instruction to Help All Students Reach Their Potential (p. 61)
1:00–1:30 PM	K–C	Cumberland 4, Omni	Educating for Ecological Identity (p. 64)
1:15–1:45 PM	4–10	Broadway A, Omni	Meet Me in the Middle Session: Earworms and Melodies: Teaching Science Through Songs (p. 66)
1:30–2:30 PM	K–12	201A, MCC	Climate Change Series IV: NOAA Climate Stewards (p. 66)
2:00–3:00 PM	K–C	Davidson B, MCC	National Earth Science Teachers Association (NESTA) Shares: Atmosphere and Ocean Share-a-Thon (p. 72)
2:00–3:00 PM	4–12	Cumberland 4, Omni	Freshwater Stewardship: Equip Your Student-Scientists with Cutting-Edge Resources from NOAA (p. 70)
2:00–3:00 PM	1–C	Legends C, Omni	Nano Days and Nights (p. 72)
2:00–3:00 PM	6–C	105A, MCC	Investigating the New Madrid Seismic Zone: New Science from Earthscope and Illustrative Physical Models for the Classroom (p. 68)
2:00–3:00 PM	6–8	106A, MCC	GeoTeach: Engaging Middle School Students in Inquiry and Engineering-based Earth Science (p. 68)
2:00–3:00 PM	7–12	Music Row 2, Omni	Using Machine Learning to Measure Learning Progressions and Inform Instruction (p. 71)
2:00–3:30 PM	1–6	207A, MCC	Elementary Science Activity Jamboree (p. 74)
2:45–3:45 PM	6–12	201A, MCC	Climate Change Series V: Use NGSS as a Pathway to Climate Literacy (p. 77)
3:30–4:30 PM	6–12	Cumberland 1, Omni	Differentiating Content, Process, and Product: Examples from Earth History, Ecology, Force and Motion, and Astronomy Units (p. 80)
3:30–4:30 PM	P–8	103B, MCC	Connecting Scientists from the Past with Scientists in Our Classrooms: Linking Place-Based Science and Culture (p. 82)
3:30–4:30 PM	6–12	106A, MCC	Climate Studies with Global Hawk and NASA Airborne Science (p. 78)
3:30–4:30 PM	4–C	Davidson B, MCC	National Earth Science Teachers Association (NESTA) Shares: Innovative Ways to Teach About Weather Observation and Weather Hazards (p. 83)
3:30–4:30 PM	P–5	104D, MCC	Three-Dimensional Learning of Space Systems Across Elementary Grade Bands (p. 82)
4:00–5:00 PM	6–12	201A, MCC	Climate Change Series VI: Climate Games and Simulations (p. 84)
5:00–6:00 PM	6–12	103B, MCC	Space Station Explorers (p. 86)
5:00–6:00 PM	4–9	Music Row 3, Omni	What Happens When the Train Runs Off the Tracks? A Problem-Based Learning Module (p. 87)
5:00–6:00 PM	3–C	105A, MCC	Explore Rocks Part 1: Rock Cycle and Igneous Rocks (p. 88)
5:00–6:00 PM	6–12	Davidson A2/3, MCC	Glaciers: Traveling Time Capsules (p. 86)
5:00–6:00 PM	9–12	106B, MCC	Teaching the High School NGSS Disciplinary Core Ideas: Earth Systems and Human Sustainability Using Real Earthquake Location Data (p. 88)
5:00–6:00 PM	4–10	Fisk Two, Renaissance	The Argumentation Toolkit: The Lawrence Hall of Science Presents a Collection of Multimedia Resources to Support Teacher Learning About Argumentation (p. 90)

Earth and Space Science: Sunday

8:00–9:00 AM	4–8	105B, MCC	Climate Science: How Can Such a Serious Topic Be so Much Fun?! (p. 97)
8:00–9:00 AM	7–12	205A, MCC	Science Is a Social Endeavor: Scientific Inquiry Through Collaborative Work (p. 97)
8:00–9:00 AM	9–12	207C, MCC	Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events (p. 94)
8:00–9:00 AM	4–C	207D, MCC	Your Ecological Footprint in a 3 D NGSS Classroom (p. 97)

Schedule at a Glance Earth and Space Science

9:30–10:30 AM	4–C	207C, MCC	Exploring Earth Science: Hands-On NGSS-Based Investigations from the Exploratorium (p. 104)
9:30–10:30 AM	9–12	105A, MCC	Cheap Investigations... Priceless Student Learning (p. 102)
9:30–10:30 AM	8–C	201B, MCC	Examining the Evidence: Using Data to Pose and Answer Questions around Earth's Changing Climate (p. 102)
9:30–10:30 AM	5–8	205C, MCC	Moon "Face" Model (p. 100)
9:30–10:30 AM	3–9	205A, MCC	Drill into the Past with the International Ocean Discovery Program (p. 104)
9:30–10:30 AM	5–C	101C, MCC	NSTA Press® Session: What Are They Thinking? Investigating the Moon Through Formative Assessment Probes and Strategies That Link Concepts and Practices (p. 101)
9:30–10:30 AM	3–10	209C, MCC	Learning about Earth's Hydrosphere Using STEAM Skills! (p. 104)
9:30–10:30 AM	7–12	208B, MCC	From Silos to STEM: Developing Real Thinkers (p. 104)
9:30–10:30 AM	6–12	105B, MCC	Climate Change Education Inside Out (p. 102)
10:00–10:30 AM	9–C	101E, MCC	Using Web-Based Resources to Assist Diverse Learners to Learn Scientific Concepts While Engaging in Science Practices (p. 104)
11:00–11:30 AM	9–C	206 A/B, MCC	Using Eclipses to Teach the Evolution of Astronomy (p. 105)
11:00AM–12 Noon	K–C	104A, MCC	Strengthening K–12 Teachers through AMS Professional Development Programs (p. 105)
11:00AM–12 Noon	3–C	207C, MCC	Explore Rocks Part 2: Sedimentary and Metamorphic Rocks (p.)
11:00AM–12 Noon	10–12	109, MCC	Geospatial Technology and Its Applications (p. 105)
11:00AM–12 Noon	6–12	106A, MCC	Climate Change Research on the Arctic Tundra: Lessons and Labs from a Teacher at Toolik Field Station in Alaska (p. 106)
11:00AM–12 Noon	3–6	104C, MCC	Rockin' Earth Science: Weathering and Erosion (p. 108)
11:00AM–12 Noon	3–8	105B, MCC	Aerospace Adventurers: Launching an After-School Aeronautics and Space Education Program (p. 109)
11:30AM–12 Noon	9–C	206 A/B, MCC	Climate Change: Using Story Maps to Explore Complex Spatial Concepts (p. 110)

Engineering, Technology, and the Application of Science: Saturday

8:00–9:00 AM	K–5	Music Row 5, Omni	Earthquake! Integrating CCSS and NGSS in the Elementary Science and Engineering Classroom (p. 22)
8:00–9:00 AM	4–12	Davidson A2/3, MCC	Scientists for Tomorrow: An Initiative to Promote STEM in Out-of-School-Time Frameworks (p. 96)
8:00–9:00 AM	9–12	207C, MCC	Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events (p. 94)
8:00–9:00 AM	4–8	101 A/B, MCC	STEMulate Student Learning by Infusing Engineering Design Using the 6 Es (p. 20)
8:00–9:00 AM	2–8/C	Broadway H, Omni	Design Engineering with Young Learners Using Edible Lunar Vehicles (p. 18)
8:00–9:00 AM	7–12	Music City Blrm., Renaissance	CEEMS: Challenge-Based Learning Units Incorporating Engineering Design with Secondary Science and Math Content (p. 19)
8:00–9:00 AM	K–12	Legends G, Omni	Science Explorations with Deaf and Hard of Hearing Students (p. 22)
8:00–9:00 AM	9–12	101D, MCC	NSTA Press® Session: Integrating Engineering Practices into a Whole-Class Inquiry Challenge (p. 17)
8:00–9:30 AM	6–8	202B, MCC	Self-Propelled Vehicles! Constructing Engaging Engineering Experiences Using NGSS Performance Expectations (p. 24)
8:30–9:00 AM	P–C	Acoustic, Omni	Smithsonian National Air and Space Museum Exhibits as Sources for STEM Investigations (p. 28)
8:00–9:30 AM	12	107A, MCC	AP Environmental: Using Your Stream to Teach STEM-Based Skills (p. 23)
9:30–10:00 AM	K–1/C	Music City Blrm., Renaissance	Primary Students and Teachers Practicing Authentic Engineering Practices: Look, Draw, Build, and Do It Again! (p. 30)
9:30–10:30 AM	3–10	Legends B, Omni	Games in Science! How to Use Them Effectively! (p. 36)
9:30–10:30 AM	*–C	101E, MCC	Students Answer Sustainable Energy Research Questions with Current Science and Engineering Data (p. 35)
9:30–10:30 AM	1–12	Music Row 2, Omni	STEM Teacher Liability: Walking on the Safer Side! (p. 34)
9:30–10:30 AM	6–12	103A, MCC	Engineering Remotely Operated Vehicles Incorporates Three-Dimensional Learning to Improve Student Achievement (p. 31)
9:30–10:30 AM	3–C	Electric, Omni	ICARUS (p. 34)

Schedule at a Glance Engineering, Technology, and the Application of Science

9:30–10:30 AM	K–8	Davidson A2/3, MCC	Old Dog, New Tricks: Transitioning to Engineering and Design Challenges (p. 32)
9:30–10:30 AM	1–5	104C, MCC	Meaningful Integration Between STEM Subjects in the Elementary Classroom (p. 35)
9:30–10:30 AM	9–12	Music Row 1, Omni	Engage with Engineering: Preparing a Science Department to Integrate Engineering Practices into its Courses (p. 34)
9:30–10:30 AM	3–C	Center Blrm., Renaissance	Augmented Science (p. 36)
9:30–10:30 AM	1–9	104E, MCC	Bringing Engineering, Technology, and Applications of Science into the Elementary and Middle School Classroom (p. 35)
9:30–10:30 AM	3–9	205A, MCC	Drill into the Past with the International Ocean Discovery Program (p. 104)
9:30–11:30 AM	K–12	Broadway J, Omni	AMSE Session: George W. Carver Conversations Series on Diversity and Equity (p. 38)
10:00–11:30 AM	K–12	207B, MCC	Using Fables to Scaffold Inquiry-Based STEM Instruction and the Engineering Design Process (p. 40)
10:00–11:30 AM	6–12	212, MCC	A Peek Behind the Curtain: Disney Parks Approach to Physics and Energy (p. 42)
10:00–11:30 AM	8–C	214, MCC	Let's Get Helical (p. 42)
10:15–10:45 AM	5–9	Broadway C, Omni	Meet Me in the Middle Session: Everyday Engineering (p. 43)
11:00–11:30 AM	5–8	Broadway C, Omni	Meet Me in the Middle Session: More Engineering to the Standards (p. 45)
11:00–11:30 AM	3–8	106A, MCC	Robotics Project for Elementary and Middle Grades Preservice Teachers (p. 44)
11:00AM–12 Noon	4–8	103B, MCC	Making STEAM Rise in Your School (p. 45)
11:00AM–12 Noon	4–7	103C, MCC	Come Fly with Us! (p. 49)
11:00AM–12 Noon	3–12	Legends E, Omni	Designing Design: A New Model for 21st-Century Teaching (p. 52)
11:00AM–12 Noon	9–12	Music Row 1, Omni	HS Engineering 4.0: Going from One Engineering Class to an Articulated 4-Year Science/CVTE Engineering Program (p. 48)
11:00AM–12 Noon	K–5	104C, MCC	Supporting English Language Learners in STEM Education through Engagement in Engineering (p. 49)
11:15AM–12 Noon	4–8	Broadway H, Omni	Fly with Banning! (p. 53)
12 Noon–1:30 PM	P–5	208B, MCC	From “Science Is for Others” to “Science Is for Me”—Hands-On Modules to Engage All Students (p. 54)
12:30–1:00 PM	6–8	Broadway D, Omni	Meet Me in the Middle Session: Engineering Practice in Middle School Chemistry (p. 58)
12:30–1:00 PM	6–12	Cumberland 5, Omni	Gender Equitable Teaching Strategies for Engaging Girls in Engineering and Technology Pathways (p. 57)
12:30–1:00 PM	8–12	Music Row 1, Omni	Chemical Action-based Curriculum (p. 57)
12:30–1:00 PM	5–9	103A, MCC	Warm the Water to Save Your City: An Engineering and Educational Technology NGSS Student Assessment Task (p. 56)
12:30–1:30 PM	3–C	Center Blrm., Renaissance	Exploring Light and Color: Hands-On NGSS-Based Investigations from the Exploratorium (p. 64)
12:30–1:30 PM	7–12	Legends A, Omni	Smart Switches (p. 62)
12:30–1:30 PM	P–5	104D, MCC	A Way with Words: Integrating Science, Engineering, and ELA in Elementary Classrooms (p. 62)
12:30–1:30 PM	K–6/C	103C, MCC	Lead with Science: Learn How to Use Science Tasks to Reinforce <i>CCSS for ELA and Mathematics</i> (p. 62)
12:30–1:30 PM	6–12	Cumberland 2, Omni	Meeting the NGSS... Even When You Don't Have To (p. 60)
12:30–1:30 PM	6–12	Broadway H, Omni	Dive into Engineering Design: Connecting Physical Science and Engineering Through Underwater Robotics (p. 60)
12:30–1:30 PM	6–12	106A, MCC	DIY: Solar Panels (p. 58)
12:30–1:30 PM	K–12	West Blrm., Renaissance	Three Dimensions, Vertical Alignment, and STEM: Sequential Skill Building for Student Success (p. 61)
1:00–1:30 PM	9–12	Cumberland 3, Omni	Robotics in the Classroom (p. 64)
2:00–3:00 PM	K–5	104D, MCC	STEM: Not Just Another Thing... (p. 71)
2:00–3:00 PM	4–C	Legends B, Omni	Capturing Engineering Design and Process in Youth Portfolios (p. 72)
2:00–3:00 PM	K–12	Broadway G, Omni	App and at 'em: Using Technology in Professional Development (p. 70)
2:00–3:00 PM	5–C	Fisk Two, Renaissance	Design Thinking: A Creative Engineering Approach to Problem Solving (p. 71)
2:00–3:00 PM	6–8	106C, MCC	This Efficient House (p. 72)
2:00–3:00 PM	6–8	106A, MCC	GeoTeach: Engaging Middle School Students in Inquiry and Engineering-based Earth Science (p. 68)
2:00–3:30 PM	6–12	207D, MCC	Introductory Engineering Design Projects with Vernier (p. 74)

Schedule at a Glance Engineering, Technology, and the Application of Science

2:00–3:30 PM	3–5	202B, MCC	Wind Turbines and Fruit Batteries! Constructing Engaging Engineering Experiences Using <i>NGSS Performance Expectations</i> (p. 74)
3:30–4:30 PM	P–6	106B, MCC	Keeping Things in Motion using NASA and Newton’s Laws (p. 83)
3:30–4:30 PM	5–10	Legends C, Omni	Using Paper Airplane Design to Teach Scientific Investigations and the <i>NGSS Engineering Practices</i> (p. 83)
3:30–4:30 PM	5–8	105B, MCC	Using the Tools of the <i>NGSS</i> to Reach Girls in Science (p. 82)
3:30–4:30 PM	9–12	Cumberland 5, Omni	From the Love Canal to Phytoremediation: What’s New in Environmental Engineering? (p. 80)
5:00–6:00 PM	P–3	104A, MCC	We Are Engineers, Too! (p. 86)
5:00–6:00 PM	P–8	106A, MCC	The Maker Movement in EC–Grade 8 Classrooms (p. 86)
5:00–6:00 PM	4–9	Music Row 3, Omni	What Happens When the Train Runs Off the Tracks? A Problem-Based Learning Module (p. 87)
5:00–6:00 PM	P–12	Legends C, Omni	Introduction to LinkEngineering (p. 88)
5:00–6:00 PM	P–2	104C, MCC	Ramps and Pathways: An Integrated STEM Activity (p. 88)

Engineering, Technology, and the Application of Science: Sunday

8:00–9:00 AM	7–12	206 A/B, MCC	Teach Engineering Principles on the Cheap with Concrete (p. 94)
8:00–9:00 AM	K–5	104E, MCC	Engineering Through Children’s Literature (p. 96)
8:00–9:00 AM	3–5	104C, MCC	A Beginner’s Guide to Engineering Design Challenge (p. 96)
9:30–10:00 AM	4–8	106A, MCC	Let’s Explore: The Changes That Surround Us (p. 98)
9:30–10:30 AM	6–C	207D, MCC	Science Teaching for Social Justice (p. 100)
9:30–10:30 AM	6–12	206 A/B, MCC	“Pitching” Student Innovation and Community Building Through <i>Shark Tank</i> (p. 100)
9:30–10:30 AM	P–1	110A, MCC	Engineering for Kindergartners? You Bet! (p. 102)
9:30–10:30 AM	P–6	104C, MCC	Evaluating Mobile Applications for Teaching Science (p. 101)
9:30–10:30 AM	7–12	208B, MCC	From Silos to STEM: Developing Real Thinkers (p. 104)
9:30–10:30 AM	9–12	Davidson A2/3, MCC	Cheap STEM Lessons for the Classroom (p. 101)
11:00AM–12 Noon	6–12	106A, MCC	Climate Change Research on the Arctic Tundra: Lessons and Labs from a Teacher at Toolik Field Station in Alaska (p. 106)
11:00AM–12 Noon	8–12	207A, MCC	Bring the Science of Cars into the Classroom Basic (p. 106)
11:00AM–12 Noon	6–12	Davidson A2/3, MCC	Duck, Duck, Goose by the Numbers (p. 109)
11:00AM–12 Noon	5–8/C	201B, MCC	Ocean Robotics in a Landlocked 1:1 STEM Classroom (p. 108)
11:00AM–12 Noon	K–8	205A, MCC	Place-Based Engineering (p. 110)
11:00AM–12 Noon	10–12	109, MCC	Geospatial Technology and Its Applications (p. 105)
11:00AM–12 Noon	3–8	105B, MCC	Aerospace Adventurers: Launching an After-School Aeronautics and Space Education Program (p. 109)

General Science Education: Saturday

8:00–8:30 AM	1–C	Broadway B, Omni	STEM Partnerships Among All Levels: Bringing It All Together (p. 16)
8:00–8:30 AM	5–8	Davidson A2/3, MCC	The Vanderbilt Scientist-Teacher Collaborative Apprenticeship: Enhancing Science Teaching and Learning in Middle Schools (p. 15)
8:00–8:30 AM	3–12	Broadway G, Omni	Differentiated Instruction through Technology-based Menus (p. 16)
8:00–8:30 AM	4–10	Cumberland 2, Omni	Noticing Phenomena or Everyone Knows What a Zebra Looks Like (p. 16)
8:00–9:00 AM	K–12	Legends C, Omni	Creating a Real-World Experience for All Students in STEM (p. 22)
8:00–9:00 AM	7–12	Legends B, Omni	Why Can’t I Be Michael Jordan? A Planning Tool for Designing Engaging <i>NGSS</i> -Focused Science Units (p. 22)
8:00–9:00 AM	4–6	104C, MCC	To the Moon and Back (p. 20)
8:00–9:00 AM	K–12	104A, MCC	The <i>NGSS@NSTA</i> Hub (p. 18)
8:00–9:00 AM	4–C	Music Row 2, Omni	AMSE Session: Opportunities to Improve Equity in Your Classroom (p. 19)
8:00–9:00 AM	K–5	101C, MCC	NSTA Press® Session: <i>Picture-Perfect Science Lessons: Using Picture Books to Guide Inquiry, K–5</i> (p. 20)

Schedule at a Glance General Science Education

8:00–9:00 AM	9–12	Music Row 1, Omni	Student-Driven Research Projects in a High School Science Classroom (p. 19)
8:00–9:00 AM	5–12	Center Blrm., Renaissance	Paul George’s Injury: The Impact of Whole Class Modeling on Discussion (p. 23)
8:00–9:00 AM	6–12	Legends E, Omni	The Lab-O-Matic: Meet Your Classroom’s New Best Friend (p. 22)
8:00–9:00 AM	4–12	West Blrm., Renaissance	Project-Based Learning: Curriculum Design and Integration Strategies that Address NGSS and CCSS (p. 20)
8:00–9:00 AM	5–9	Mockingbird 2, Omni	Formative Assessments and the NGSS (p. 19)
8:00–9:00 AM	6–12	Cumberland 1, Omni	Teacher’s Guide to Technical Writing for STEM: Proposals, Plans, and Reports (p. 18)
8:00–9:00 AM	4–12	Cumberland 5, Omni	Using Young Adult Literature to Support Content Learning and Reading Comprehension in the Science Classroom (p. 18)
8:00–9:00 AM	4–12	Mockingbird 4, Omni	CCSS + NGSS = Science Fair (p. 19)
8:00–9:00 AM	6–C	Legends F, Omni	Crunching the Numbers: Novel Ways to Implement Graphing and Data Analysis into Your Curriculum (p. 22)
8:00–9:00 AM	K–12	Legends D, Omni	BSCS Pathway Session: Taking the Lead with the NGSS (p. 22)
8:00–9:30 AM	6–8	209B, MCC	Engage with NGSS Using STEM Gauge™ (p. 26)
8:00–9:30 AM	3–C	207D, MCC	Integrating Chromebook with Vernier Technology (p. 26)
8:00–9:30 AM	9–12	206 A/B, MCC	<i>Forensic Science for High School</i> , 3rd Edition (p. 25)
8:00–9:30 AM	K–12	107B, MCC	Albert Einstein Distinguished Educator Fellowship Program: Exciting Opportunities for K–12 STEM Educators to Influence Federal Programs and Policy in Washington, D.C. (p. 23)
8:00–9:30 AM	6–12	110A, MCC	Development of a Science Maker Kit for Inquiry-Based Teaching: Ideation and Feedback (p. 23)
8:00–9:30 AM	6–12	209C, MCC	Implementing Three-Dimensional Learning (p. 26)
8:00–9:30 AM	5–8	214, MCC	Discourse Tools for Equitable and Rigorous Talk (p. 27)
8:00–9:30 AM	6–12	208A, MCC	Get that Grant Money! (p. 26)
8:00–9:30 AM	K–12	108, MCC	Contextualizing Science Literacy with Agriculture (p. 23)
8:30–9:00 AM	P–3	101E, MCC	Little Learners, BIG Ideas: Innovative Thinking in Early Childhood (p. 28)
8:30–9:00 AM	K–C	Fisk One, Renaissance	Making Students Scientists (p. 29)
8:30–9:00 AM	P–C	Broadway B, Omni	Integrated STEM Learning with the ASSIST Teaching Approach (p. 28)
8:30–9:00 AM	5–C	Broadway G, Omni	Learning to Teach Science in an Online Environment (p. 28)
8:30–9:00 AM	3–8	Davidson A2/3, MCC	Influence of 1:1 Chromebooks on Student Learning and Associated Professional Development Strategies (p. 28)
8:30–9:00 AM	2–C	Cumberland 2, Omni	Teach Your Students to Consciously Replace Misconceptions with Sound Scientific Knowledge (p. 28)
8:30–9:30 AM	P–C	East Blrm., Renaissance	Teacher Researcher Day Session: Poster Session (p. 29)
9:30–10:00 AM	1–6/C	Fisk One, Renaissance	Teaching and Learning: Perspective on K–12 from Scientists (p. 30)
9:30–10:00 AM	7–12	Acoustic, Omni	Integrating Probes in the Interactive Notebook: The More You Put “IN” the More You Get “OUT!” (p. 30)
9:30–10:30 AM	1–5	Cumberland 5, Omni	Using a Model of Shared Language to Build Science Literacy (p. 34)
9:30–10:30 AM	P–5	106A, MCC	Adopting, Adapting, and Applying the 5E Instructional Model to Enhance Science Experiences for Students with Special Needs (p. 32)
9:30–10:30 AM	7–12	Broadway G, Omni	Enhancing and Integrating NGSS Strands Through Appropriate Uses of Technology (p. 33)
9:30–10:30 AM	6–12	Broadway H, Omni	Building Capacity for NGSS in Your District (p. 33)
9:30–10:30 AM	K–6	103C, MCC	NGSS and CCSS Mashup: Science Museum Transforms Teaching (p. 32)
9:30–10:30 AM	K–12	Music Row 5, Omni	Equity: Buzzword or Catalyst during a District Transition to the NGSS (p. 34)
9:30–10:30 AM	K–8	105B, MCC	Building Claims, Evidence, Reasoning (CER) Skills Through a Pink Palace Museum and Shelby County Schools Collaboration (p. 32)
9:30–10:30 AM	P–C	Fisk Two, Renaissance	What Do They Think? Engaging and Assessing through the Use of Visual Media (p. 34)
9:30–10:30 AM	K–6	104B, MCC	Science Notebooks: Tools to Develop Scientific Practices and Student Learning (p. 32)
9:30–10:30 AM	P–5	106B, MCC	Using Lab Notebooks in the Preschool and Elementary Classroom (p. 35)
9:30–10:30 AM	9–12	101 A/B, MCC	Teaching Macromolecules Through the Lense of Nutrition (p. 31)
9:30–10:30 AM	K–5	104A, MCC	Using Argument-Driven Inquiry with Science Writing in the K–5 Classroom (p. 32)
9:30–10:30 AM	K–12	Grand Blrm. C1, MCC	NGSS Share-a-Thon (p. 33)
9:30–10:30 AM	P–C	Cumberland 2, Omni	I CAN Ask a Question! DID I Define a Problem? (p. 33)
9:30–10:30 AM	3–12	Legends E, Omni	Building Partnerships: Schools, Museums, Nature, along with Science Centers, Scientists, and MITS (p. 36)
9:30–10:30 AM	K–12	Legends G, Omni	Analyzing and Interpreting Data: A 3-D Look at the Practice (p. 36)

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9:30–10:30 AM	5–12	West Blrm., Renaissance	Promoting Scientific Reasoning through Writing (p. 34)
9:30–10:30 AM	3–12	Legends D, Omni	BSCS Pathway Session: Using the BSCS 5E Instructional Model to Promote Three-Dimensional Learning (p. 36)
9:30–10:30 AM	P–C	Broadway A, Omni	STEM Learning Ecosystems (p. 33)
9:30–11:00 AM	P–C	East Blrm., Renaissance	Teacher Researcher Day Session: Integrating Instruction to Meet Student Needs (p. 37)
10:00–10:30 AM	P–C	Fisk One, Renaissance	Professional Learning Communities for Science Leaders (p. 38)
10:00–10:30 AM	P–C	Music City Blrm., Renaissance	Weight and See (p. 38)
10:00–10:30 AM	7–12	Acoustic, Omni	Easy Ways to Modify Existing Lessons to Deepen Student Understanding (p. 38)
10:00–11:30 AM	K–C	207A, MCC	Grant Writing: Pipelines, Partnerships, and Finding Funding (p. 40)
10:00–11:30 AM	6–C	201B, MCC	The Truth Behind Brain-Based Learning (p. 39)
10:00–11:30 AM	3–6	207D, MCC	Elementary Science with Vernier (p. 40)
10:00–11:30 AM	1–5	211, MCC	Make Science Come to Life (p. 42)
10:00–11:30 AM	P–12	208B, MCC	National Geographic Educator Certification Program (p. 41)
10:00–11:30 AM	K–C	202C, MCC	No Great Science Student (NGSS) Left Behind with NexGen Inquiry™ (p. 39)
10:00–11:30 AM	K–12	204, MCC	Implementing 3D Printing Across the K–12 Curriculum (p. 39)
10:15–10:45 AM	5–8	Broadway B, Omni	Meet Me in the Middle Session: What the NGSS Mean to a Middle Level Teacher—Thoughts from a Member of the Writing Team (p. 43)
10:15–10:45 AM	5–9	Broadway D, Omni	Meet Me in the Middle Session: Use Science to Support and Develop ELL Language Acquisition (p. 43)
10:15–10:45 AM	5–9	Broadway E/F, Omni	Meet Me in the Middle Session: Roundtable Discussions for Middle School Educators, Part 1 (p. 43)
11:00–11:30 AM	5–9	Broadway B, Omni	Meet Me in the Middle Session: Roundtable Discussion—Awards, Recognition, and Competitions for Middle School Educators (p. 44)
11:00–11:30 AM	5–9	Broadway E/F, Omni	Meet Me in the Middle Session: Roundtable Discussions for Middle School Educators, Part 2 (p. 44)
11:00–11:30 AM	5–9	Broadway D, Omni	Meet Me in the Middle Session: Science and Special Education—How to Make It Work (p. 44)
11:00–11:30 AM	6–12	Cumberland 5, Omni	Spoiling Everything They Love: The Truth Behind Pizza and Other Foods (p. 44)
11:00–11:30 AM	K–12	Fisk Two, Renaissance	Community Stakeholders: Banding Together to Leverage Green Schools (p. 44)
11:00AM–12 Noon	7–12	Legends B, Omni	Using STEM to Fight the Zombies! (p. 50)
11:00AM–12 Noon	K–8	105B, MCC	How to Assess Three-Dimensional Learning in Your Classroom: Building Tasks that Work (p. 50)
11:00AM–12 Noon	6–C	Legends C, Omni	Free Online Software for Visualizing Data Across Multiple Disciplines (p. 52)
11:00AM–12 Noon	K–C	Legends A, Omni	NSELA Session: Tools for Science Leaders (p. 47)
11:00AM–12 Noon	P–C	Music Row 2, Omni	Reviewers Needed for NSTA’s Journals (p. 48)
11:00AM–12 Noon	K–12	104A, MCC	Ten NGSS Talking Points: How to Talk about the <i>Next Generation Science Standards</i> in Your School and Community (p. 45)
11:00AM–12 Noon	P–C	Mockingbird 2, Omni	Before and After Retirement—Practicalities and Possibilities (p. 47)
11:00AM–12 Noon	P–C	104E, MCC	NSTA Press® Session: Learn Strategies to Help You Implement the NGSS Practices! (p. 50)
11:00AM–12 Noon	K–12	Music Row 3, Omni	Nuts and Bolts of Science Program Leadership at the District Level (p. 48)
11:00AM–12 Noon	K–12	101D, MCC	NSTA Press® Session: Diving into the NGSS Disciplinary Core Ideas: How and Why They Are Important for Teaching and Learning (p. 45)
11:00AM–12 Noon	K–5	104D, MCC	Reframing Classic Elementary Science Lessons with the NGSS (p. 50)
11:00AM–12 Noon	P–12	Legends D, Omni	BSCS Pathway Session: Designing Effective Professional Development for the <i>Next Generation Science Standards</i> (p. 52)
11:00AM–12 Noon	9–C	East Blrm./Gr 2, Renaissance	Teacher Researcher Day Session: Exploring Geoscience Methods: An InTeGrate Module for Preservice Secondary Science Teachers (p. 48)
11:00AM–12 Noon	6–C	East Blrm./Gr 1, Renaissance	Teacher Researcher Day Session: Project Based Learning as a Tool for Success (p. 48)
11:00AM–12 Noon	P–C	Music Row 5, Omni	Designing a Districtwide K–12 Science Program (p. 48)
11:00AM–12 Noon	6–8	East Blrm./Gr 4, Renaissance	Teacher Researcher Day Session: Claims and Evidence: Developing Scientific Argumentation for ELL, IEP, GT, and General Education Middle School Students (p. 48)
11:00AM–12 Noon	K–12	Legends G, Omni	Shifting Your Lessons to Target NGSS Science and Engineering Practices Using the NextGen ASET Rubrics (p. 52)
11:00AM–12 Noon	K–12	Fisk One, Renaissance	All About Those Bass-ic Materials in Science (p. 48)
11:00AM–12 Noon	4–10	Legends F, Omni	Science Can Flow Like Poetry! (p. 52)

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11:00AM–12 Noon	4–12	West Blrm., Renaissance	Transforming Teaching into Three-Dimensional Learning (p. 49)
11:00AM–12 Noon	6–12	Cumberland 3, Omni	Academic Language: More Vocabulary Strategies to Enhance Engagement and Learning (p. 46)
11:00AM–12 Noon	K–C	Mockingbird 4, Omni	ACT’s National Curriculum Survey: Insights about Science Curricula on a National Scale (p. 48)
11:00AM–12 Noon	P–C	Cumberland 2, Omni	Science for All: Including Diverse Learners (p. 46)
11:30AM–12 Noon	4–C	Music City Blrm., Renaissance	Using Social Media to Enhance Science Class (p. 53)
12 Noon–12:30 PM	P–C	East Blrm., Renaissance	Teacher Researcher Day Session: Leading from the Classroom: Science Inquiry Group Network (p. 53)
12 Noon–1:30 PM	6–9	209C, MCC	SAE Middle School Educational Offerings (p. 54)
12 Noon–1:30 PM	7–C	201B, MCC	Learning Through Hands-On Activities (p. 53)
12 Noon–1:30 PM	3–12	210, MCC	Citizen Science—From Classroom to Field with the U.S. Fish and Wildlife Service (p. 54)
12 Noon–1:30 PM	1–5	211, MCC	Make Science Come to Life (p. 55)
12:30–1:00 PM	P–12	103B, MCC	Empowering Our Students to Be Citizen Scientists! (p. 56)
12:30–1:00 PM	P–C	East Blrm./Gr 4, Renaissance	Teacher Researcher Day Session: Communicating in Scientific Ways (p. 57)
12:30–1:00 PM	6–C	East Blrm./Gr 2, Renaissance	Teacher Researcher Day Session: What Issues Impact Maximizing Instructional Time When Using a Technology-Centered Curriculum (p. 57)
12:30–1:00 PM	1–8	East Blrm./Gr 1, Renaissance	Teacher Researcher Day Session: Do Novice Elementary Teachers See Scientists in Their Classroom? (p. 57)
12:30–1:00 PM	9–12	Acoustic, Omni	Conceptually Concrete (p. 56)
12:30–1:00 PM	9–12	Cumberland 3, Omni	STEM for All (p. 57)
12:30–1:00 PM	K–12	Cumberland 1, Omni	Global Collaboration in the Science Classroom (p. 56)
12:30–1:00 PM	6–C	Electric, Omni	Standards-Based Grading Strategies and Solutions (p. 57)
12:30–1:00 PM	7–C	Cumberland 4, Omni	Eradicate Point Grubbing (p. 57)
12:30–1:00 PM	6–8	Broadway A, Omni	Meet Me in the Middle Session: Formative Assessment in the Classroom (p. 56)
12:30–1:00 PM	5–8	Broadway B, Omni	Meet Me in the Middle Session: Know the “Dirty Dozen” for a Safer Lab Experience! (p. 56)
12:30–1:00 PM	5–8	Broadway C, Omni	Meet Me in the Middle Session: Citizen Science in YOUR Classroom (p. 58)
12:30–1:30 PM	6–12	Davidson C, MCC	STEM Educators Award-Winning Share-a-Thon (p. 60)
12:30–1:30 PM	K–12	Music Row 3, Omni	Nuts and Bolts of Science Program Leadership at the School Level (p. 61)
12:30–1:30 PM	P–C	Broadway J, Omni	Research Insights into Online Communities of Practice and Teacher Learning Online: NSTA Learning Center (p. 60)
12:30–1:30 PM	K–5	104B, MCC	STEM for All: Building a Schoolwide STEM Program (p. 58)
12:30–1:30 PM	P–3	106B, MCC	Science Notebooks K–3 (p. 62)
12:30–1:30 PM	4–C	Legends C, Omni	Taking Advantage of the Power of Google Drive (p. 62)
12:30–1:30 PM	9–12	Broadway G, Omni	Harmonizing Science and Math: Making High School Math Relevant (p. 60)
12:30–1:30 PM	C	Mockingbird 2, Omni	Being a Unicorn: Preservice Teachers and Their Quest for a Professional Identity (p. 60)
12:30–1:30 PM	K–5	104A, MCC	Bloom Where You Are Planted: Growing an Elementary STEM Program (p. 58)
12:30–1:30 PM	K–5	101C, MCC	Supporting the NGSS and CCSS in Urban Elementary Classrooms (p. 61)
12:30–1:30 PM	P–12	Fisk One, Renaissance	Science for Everyone! Engaging Science Instruction for Students with Profound Disabilities (p. 61)
12:30–1:30 PM	9–C	Legends G, Omni	A Practical Guide for Aligning Existing Materials to the NGSS: The EQUIP Rubric (p. 63)
12:30–1:30 PM	K–8	Davidson A2/3, MCC	Students with Inquiring Minds Are Scientists (SWIMAS): A Study of Elementary Inquiry Science (p. 58)
12:30–1:30 PM	K–C	Music City Blrm., Renaissance	<i>Mindset</i> and the Educational Revolution (p. 61)
12:30–1:30 PM	3–12	101E, MCC	Write to Know Science (p. 58)
12:30–1:30 PM	5–C	Grand Blrm. C2, MCC	School District and Community Engagement in STEM Education on the International Space Station...and Beyond (p. 60)
1:00–1:30 PM	6–C	East Blrm./Gr 3, Renaissance	Teacher Researcher Day Session: How the Search for Bigfoot Can Teach Science and Engineering Practices (p. 65)
1:00–1:30 PM	9–12	103B, MCC	Using Career Academies to Develop Community Partnerships in the Classroom (p. 64)
1:00–1:30 PM	C	Mockingbird 4, Omni	Developing Community College Students’ Research Skills (p. 65)
1:00–1:30 PM	7	East Blrm./Gr 2, Renaissance	Teacher Researcher Day Session: Student-Developed Assessment (p. 65)
1:00–1:30 PM	9–12	Acoustic, Omni	Promoting Academic Integrity in Your Classroom (p. 64)
1:00–1:30 PM	K–12	Cumberland 1, Omni	“Link-ing” to Learn (p. 64)

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1:00–2:30 PM	7–10	110A, MCC	Getting to Know the <i>Creative Coding Through Games and Apps</i> (CCGA) Course Content (p. 65)
1:15–1:45 PM	6–8	Broadway B, Omni	Meet Me in the Middle Session: Science Formative Assessment: What Do Middle School Students Really Think? (p. 66)
1:15–1:45 PM	6–8	Broadway D, Omni	Meet Me in the Middle Session: Using 5Es to Engage Middle Schoolers (p. 66)
1:15–1:45 PM	7–8	Broadway C, Omni	Meet Me in the Middle Session: Engaging Students in Science with Interactive Notebooks and Nature Journaling (p. 66)
2:00–2:30 PM	P–C	East Blrm./Gr 2, Renaissance	Teacher Researcher Day Session: Multimedia Portfolios as Assessment (p. 67)
2:00–2:30 PM	C	Music Row 3, Omni	Recruiting STEM Talent and Designing Pathways for STEM Teaching (p. 67)
2:00–2:30 PM	6–12	Cumberland 3, Omni	Using STEM Interactives in the Classroom to Connect Learning to Real-World Applications (p. 67)
2:00–2:30 PM	6–12	Acoustic, Omni	History Should be Repeated in the Science Classroom (p. 66)
2:00–3:00 PM	4–12	Music City Blrm., Renaissance	The Magic of Science! Motivate Your Science Students Using “Discrepant Events” (p. 71)
2:00–3:00 PM	7–12	Legends E, Omni	Critical Perspectives on Using News Media in the Science Classroom (p. 72)
2:00–3:00 PM	K–5	101D, MCC	NSTA Press® Session: Five E(z), “Elementary” Steps To Next Generation Science Teaching (p. 68)
2:00–3:00 PM	2–5	104C, MCC	Integrating STEM into the Entire Elementary Curriculum (p. 71)
2:00–3:00 PM	1–6	104B, MCC	Don’t Open That Textbook Yet, You’ve Got a Story to Share! (p. 68)
2:00–3:00 PM	K–12	Cumberland 1, Omni	Building Effective STEM Partnerships on a Limited Budget (p. 70)
2:00–3:00 PM	3–C	Center Blrm., Renaissance	Science at the Dollar Store (p. 72)
2:00–3:00 PM	K–6/C	Electric, Omni	Enhancing Science Understanding through Conceptual Change Lessons (p. 70)
2:00–3:00 PM	K–12	Music Row 5, Omni	Equity in the Science Classroom (p. 71)
2:00–3:00 PM	3–C	Cumberland 5, Omni	Problem-Based Learning: A Partnership Using NGSS and CCSS (p. 70)
2:00–3:00 PM	K–C	Broadway B, Omni	Inside the Science Teacher’s Studio (p. 70)
2:00–3:00 PM	P–C	103B, MCC	NSTA/ASE Honors Lecture: The Learning Journey (p. 67)
2:00–3:00 PM	P–C	Grand Blrm. C2, MCC	Arthur C. Clarke Institute for Space Education Lecture: Thoughts on Science Education, Science, and Personal Beliefs (p. 68)
2:00–3:30 PM	1–5	211, MCC	Make Science Come to Life (p. 75)
2:00–3:30 PM	P–C	Davidson C, MCC	Multicultural/Equity Share-a-Thon (p. 73)
2:00–4:00 PM	5–9	Broadway E/F, Omni	Meet Me in the Middle Session: Middle Level Share-a-Thon (p. 76)
2:00–4:00 PM	P–C	Broadway K, Omni	Alliance of Affiliates Session: The 3Rs: Research, Resources, and Relationships (p. 76)
2:30–3:00 PM	K–C	Cumberland 2, Omni	The Future of School (p. 76)
2:30–3:00 PM	7–12	Cumberland 3, Omni	Putting the TECH into TEaCHing (p. 76)
2:30–3:00 PM	6–12	Acoustic, Omni	Culturally Relevant Teaching Practices in Science Classrooms (p. 76)
2:30–3:00 PM	6–C	East Blrm./Gr 4, Renaissance	Teacher Researcher Day Session: The Effect of Scientific Research on High School Students (p. 77)
2:30–3:00 PM	P–C	East Blrm./Gr 1, Renaissance	Teacher Researcher Day Session: Using Scientific Literacy as a Reflective Practitioner (p. 77)
2:30–3:00 PM	1–C	East Blrm./Gr 2, Renaissance	Teacher Researcher Day Session: Learning About Motion Is MESSY (p. 77)
2:30–3:00 PM	C	Music Row 3, Omni	How to Create an Engaging and Successful Online Science Classroom (p. 76)
3:00–4:30 PM	7–12	110A, MCC	The Differentiated Classroom in One Package: Teaching Science Inquiry to Modern Learners Using Microsoft Surface and Apps (p. 77)
3:30–4:00 PM	7–C	Fisk One, Renaissance	Using Multi-Genre Writing to Infuse NGSS into the Science Classroom (p. 77)
3:30–4:30 PM	1–7	Davidson A2/3, MCC	Oh Say, Can You C-E-R? (p. 78)
3:30–4:30 PM	7–12	Cumberland 2, Omni	But I Can’t Do Science! Changing a Culture of Learned-Helplessness through Standards-based Grading (p. 80)
3:30–4:30 PM	9–12	Acoustic, Omni	Multi-Level Peer Tutoring Supports Student Success in High School Science (p. 80)
3:30–4:30 PM	K–C	Fisk Two, Renaissance	A Visual Representation of Three-Dimensional Learning: A Model for Understanding and a Tool for Evaluating Curricula (p. 81)
3:30–4:30 PM	3–C	101C, MCC	NSTA Press® Session: <i>Uncovering Student STEM-Connected Ideas in Science</i> (p. 82)
3:30–4:30 PM	K–6	104B, MCC	Full STEAM Ahead (p. 78)
3:30–4:30 PM	9–C	Cumberland 4, Omni	Using Models to Teach How Blood Spatter Tells a Story! (p. 80)
3:30–4:30 PM	6–12	Broadway G, Omni	Bring the Experts (Virtually) into Your Classroom (p. 80)
3:30–4:30 PM	7–12	103A, MCC	Motivating Modeling with Anchoring Phenomena and Challenge Questions (p. 82)
3:30–4:30 PM	8–10	Music Row 3, Omni	How to Get Students to Open Their Textbooks and Look Forward to It (p. 81)

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3:30–4:30 PM	K–8	Music Row 5, Omni	SIRA: Science Instructional Reflection and Assessment: Creating a Curricular Roadmap to NGSS (p. 81)
3:30–4:30 PM	6–8	Broadway H, Omni	Weaving Literacy and Technology into the Middle School Science Classroom (p. 80)
3:30–4:30 PM	6–12	Legends G, Omni	and...ACTION! (p. 83)
3:30–4:30 PM	5–12	Music Row 1, Omni	Becoming Teacher Leaders in a Turnaround School (p. 81)
3:30–4:30 PM	6–12	Music Row 2, Omni	Three Steps to Greater Use of NGSS Practices and Stellar Student Research Projects (p. 81)
3:30–4:30 PM	K–12	Center Blrm., Renaissance	Showing Student Growth of the NGSS: How Do You Know that Your Students Are Really Learning? (p. 83)
3:30–4:30 PM	K–12	Legends F, Omni	Planning a Journey Toward the NGSS (p. 83)
3:30–4:30 PM	K–C	Legends E, Omni	Using Whiteboarding as a Strategy for Integrating ELA into Science (p. 83)
3:30–4:30 PM	5–12	Music City Blrm., Renaissance	Interactive Notebooks in Middle School Science (p. 81)
3:30–4:30 PM	P–C	101D, MCC	Featured Presentation: Bundling the NGSS Performance Expectations (p. 78)
3:30–4:30 PM	9–12	101E, MCC	From Cookbook to Open Inquiry: How to Develop the Necessary Skills (p. 78)
4:00–4:30 PM	5–12	Fisk One, Renaissance	Standardized Tests Put to Good Use (p. 84)
5:00–5:30 PM	9–12	Music Row 1, Omni	Let's Get Talkin' About Science! (p. 85)
5:00–5:30 PM	6–C	101E, MCC	Enhanced Exit Ticket: Round-Trip to Greater Student-Teacher Accountability (p. 84)
5:00–5:30 PM	3–6	104B, MCC	Integrating Science, Reading, and Writing with a Three-in-One Project (p. 84)
5:00–5:30 PM	5–10	West Blrm., Renaissance	Powering Our Students' Futures (p. 85)
5:00–6:00 PM	12–C	Mockingbird 4, Omni	Integration of the NGSS into an Interdisciplinary Freshman Experience Course (p. 87)
5:00–6:00 PM	7–12	Legends G, Omni	Stimulate Student Learning with Food! (p. 90)
5:00–6:00 PM	7–12	Cumberland 5, Omni	Tesla Tales (p. 87)
5:00–6:00 PM	6–12	Acoustic, Omni	Rigor and Reasoning: From Knowing Science to Understanding Science (p. 86)
5:00–6:00 PM	8–C	Cumberland 4, Omni	Simulate STEM Online Through Virtual Clinical Trials (p. 87)
5:00–6:00 PM	3–5	104D, MCC	Did I Learn That? Tips and Techniques to Ensure Mastery of Science Concepts (p. 88)
5:00–6:00 PM	6–8	Music Row 5, Omni	Argumentation and Making the Transition to NGSS: How Do Students Develop Fluency in Engaging in Argument from Evidence? (p. 86)
5:00–6:00 PM	K–C	Music Row 2, Omni	Teaching as Storytelling: How to Infuse History, Mystery, and Inquiry into Your Science Topic Teaching (p. 87)
5:00–6:00 PM	6–12	Electric, Omni	Creating a Professional Learning Community to Facilitate Collaboration in Science Inclusion Classrooms (p. 87)
5:00–6:00 PM	4–C	Center Blrm., Renaissance	I'm the Teacher... How Do I Teach About Nature of Science? (p. 90)
5:00–6:00 PM	P–C	Fisk One, Renaissance	Retiring? Tips for the Next Phase of Your Life (p. 87)
5:30–6:00 PM	9–C	101E, MCC	Primary Literature: Students Reading Real Science (p. 90)

General Science Education: Sunday

8:00–8:30 AM	5–9	106A, MCC	Reasons Students Struggle with Reasoning (p. 93)
8:00–9:00 AM	6–12	208B, MCC	Science in the One-to-One Classroom (p. 94)
8:00–9:00 AM	6–12	207B, MCC	Forensics 101: From the Ground Up (p. 94)
8:00–9:00 AM	9–12	209A, MCC	Integrating Literacy Standards in Science (p. 94)
8:00–9:00 AM	5–12	208A, MCC	Go Green! Build and Sustain a Project-Based Learning Garden Program at Your School! (p. 94)
8:00–9:00 AM	6–9	103C, MCC	Chapter Books at the Crossroads of the NGSS and CCSS (p. 96)
8:00–9:00 AM	2–8	106C, MCC	What Constitutes High-Quality Discussion in a Science Classroom? (p. 93)
8:00–9:00 AM	6–8	205C, MCC	Learning Targets for Student-led Labs (p. 94)
8:00–9:00 AM	9–12	209B, MCC	Partnering with Community Resources to Create a Whodunit (p. 94)
8:00–9:00 AM	P–C	209C, MCC	Industry's Role in Creating the Next Generation of Scientists (p. 96)
8:00–9:00 AM	K–6	104B, MCC	iPad Apps for STEM Activities in the Elementary Classroom (p. 93)
8:00–9:00 AM	5–C	101C, MCC	NSTA Press® Session: CCSS ELA and Literacy + NGSS = Even More Brain-Powered Science (p. 96)
8:00–9:00 AM	K–5	104D, MCC	Exploring Different Acid/Base Indicators in the Classroom (p. 96)
8:00–9:00 AM	9–12	202C, MCC	Learning to Fail: Building Confidence with Data Collection (p. 97)
8:00–9:00 AM	9–C	204, MCC	EdTech and Your Ideal Classroom: Using Educational Technology to Support a Science Classroom Community (p. 97)

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8:00–9:00 AM	P–8	105A, MCC	Project-Based Learning (PBL) for 21st-Century Thinkers and Innovators (p. 97)
8:30–9:00 AM	4–9	106A, MCC	Universal Design for Learning: What It Is, and What It Isn't (p. 98)
8:30–9:00 AM	5–12	101E, MCC	Using Expeditions as Contexts for Teaching Science: Adventure Mississippi River (p. 98)
9:30–10:00 AM	K–5	101E, MCC	Science Fair: A Learning Progression Across K–5 (p. 98)
9:30–10:00 AM	K–6	104A, MCC	How Does Vocabulary Fit into PBL for English Language Learners? (p. 98)
9:30–10:30 AM	K–8	103C, MCC	Project Based Learning: How It Has Changed Teaching and Learning in Our School (p. 100)
9:30–10:30 AM	7–12	204, MCC	Are You EQuIPped? (p. 102)
9:30–10:30 AM	K–8	106C, MCC	Modeling the NGSS Way (p. 102)
9:30–10:30 AM	4–8	106B, MCC	Inquiry through Teamwork! (p. 102)
9:30–10:30 AM	5–12	108, MCC	Coding Computer Games to Motivate Middle School Science Students (p. 100)
9:30–10:30 AM	6–12	109, MCC	Fall Head Over Heels for Flipping Your Classroom! (p. 100)
9:30–10:30 AM	P–5	104B, MCC	Transforming Schools Through Professional Development: An Interconnected Approach (p. 100)
9:30–10:30 AM	5–12	207A, MCC	Supporting STEM/STEAM Curriculum in the Digital Age (p. 100)
9:30–10:30 AM	7–8	205B, MCC	Using Flipped Classrooms to Assess the Mastery of Objectives in Middle School (p. 100)
9:30–10:30 AM	9–12	209A, MCC	Beyond the Gumdrop Mountain: Using Models in Your Classroom (p. 101)
11:00AM–12 Noon	6–12	207B, MCC	The Science of Natural Disasters: A High School Elective (p. 106)
11:00AM–12 Noon	4–9	208A, MCC	Making the Science Curriculum Culturally Relevant (p. 106)
11:00AM–12 Noon	9–12	209B, MCC	Planning in 3-D: Preparing Lessons for Three-Dimensional Learning (p. 106)
11:00AM–12 Noon	7–9	205C, MCC	How Can My Students Organize a Science Summit for Our Community? (p. 106)
11:00AM–12 Noon	6–C	209A, MCC	Science Lab Renovations: Working Strategically with Architects to Create 21st-Century Labs (p. 106)
11:00AM–12 Noon	6–9	103C, MCC	Data Literacy for Science Teachers: Understanding and Integrating CCSS Mathematics Data Standards to Strengthen Your Science Curriculum (p. 108)
11:00AM–12 Noon	K–6	104B, MCC	Elementary Science Camps (p. 105)
11:00AM–12 Noon	9–C	202C, MCC	Increasing Student Critical Thinking in Evaluating the Credibility of an Information Source (p. 109)
11:00AM–12 Noon	K–12	108, MCC	What Constitutes a STEAM Effective Practice? Learn Findings from Research Conducted by a National STEAM Collaborative (p. 105)
11:00AM–12 Noon	6–9	106C, MCC	How to Scaffold Scientific Literacy for ELLs (p. 105)
11:00AM–12 Noon	6–12	204, MCC	Using the Science Writing Heuristic as a Method for Implementing Three-Dimensional Learning (p. 109)
11:00AM–12 Noon	9–C	201A, MCC	How STEM Career Interest Changes in High School (p. 106)
11:00AM–12 Noon	P–8	110A, MCC	Designing Activities for STEM: A Simple Solution for Bundling the CCSS and NGSS (p. 109)

Informal Science Education: Saturday

8:00–8:30 AM	K–12	Acoustic, Omni	Making Informal Partnerships More Formal (p. 15)
8:00–9:00 AM	K–8	105B, MCC	Beyond the Fair: Carnivals, Olympiads, and STEAM Clubs—Oh My! (p. 21)
8:00–9:00 AM	K–12	Music Row 3, Omni	ASTC Session: Beyond the Classroom Walls—Tapping into Informal Science Centers to Support Student-Driven Investigations (p. 19)
8:00–9:00 AM	1–12	Cumberland 3, Omni	After-School STEM Partnerships in Nashville (p. 18)
8:00–9:30 AM	K–12	201B, MCC	Engagement Unlocked! Using Learning Games for STEM (p. 24)
8:30–9:00 AM	P–C	Acoustic, Omni	Smithsonian National Air and Space Museum Exhibits as Sources for STEM Investigations (p. 28)
9:30–10:30 AM	1–5/9–12	103B, MCC	Science Ambassadors: Partnering Elementary and High Schools for STEM Night Events (p. 31)
9:30–10:30 AM	G	104A, MCC	Using the 2017 U.S. Total Solar Eclipse to Promote Educational Outreach (p. 32)
9:30–10:30 AM	6–C	Legends F, Omni	Family Science Night: Involving Community Stakeholders (p. 36)
9:30–10:30 AM	K–12	Legends C, Omni	Engage Families with Your STEM Teaching (p. 36)
10:00–11:30 AM	2–C	110B, MCC	McDowell Farm School: Integrating Best Practices in a Scientific Garden (p. 39)
10:00–11:30 AM	3–8	210, MCC	Engaging Your Students Through the U.S. Fish & Wildlife Service's Conservation Connect (p. 42)
11:00AM–12 Noon	P–C	Cumberland 1, Omni	Best Practices in Community Partnerships: It's a Two-Way Street! (p. 46)

Schedule at a Glance Informal Science Education

11:00AM–12 Noon	1–8	Davidson A2/3, MCC	Using TALES to Enhance Learning in an After-School Program (p. 46)
11:00AM–12 Noon	4–8	103B, MCC	Making STEAM Rise in Your School (p. 45)
11:00AM–12 Noon	P–C	Music Row 5, Omni	Designing a Districtwide K–12 Science Program (p. 48)
11:30AM–12 Noon	K–C	Fisk Two, Renaissance	Think Science—Taking It to the Streets (p. 53)
12 Noon–1:30 PM	3–12	210, MCC	Citizen Science—From Classroom to Field with the U.S. Fish and Wildlife Service (p. 54)
12:30–1:30 PM	5–C	Grand Blrm. C2, MCC	School District and Community Engagement in STEM Education on the International Space Station...and Beyond (p. 60)
1:00–1:30 PM	9–C	Electric, Omni	The Environmental Science Summer Research Experience for Young Women (p. 65)
2:00–2:30 PM	K–12	Cumberland 2, Omni	Get the Maker Party Started (p. 66)
2:00–3:00 PM	1–C	Legends C, Omni	Nano Days and Nights (p. 72)
2:00–4:00 PM	P–C	104A, MCC	Science in the Community Session: Forum on Family Science Learning (p. 75)
3:30–4:30 PM	K–11	West Blrm., Renaissance	Science Beyond the Classroom (p. 81)
5:00–6:00 PM	P–12	Legends C, Omni	Introduction to LinkEngineering (p. 88)
5:00–6:00 PM	6–12	Cumberland 2, Omni	Hosting STEM Nights? Use Inquiry-Based Investigations to Engage Learners of All Ages (p. 86)

Informal Science Education: Sunday

8:00–9:00 AM	4–12	Davidson A2/3, MCC	Scientists for Tomorrow: An Initiative to Promote STEM in Out-of-School-Time Frameworks (p. 96)
8:00–9:00 AM	9–12	207C, MCC	Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events (p. 94)
8:30–9:00 AM	1–5	104A, MCC	Nature on My Block: Place-Based Ecology Lessons for Urban Students (p. 93)
10:00–10:30 AM	K–8	103B, MCC	Building a Learning Garden While Integrating Literacy and Science (p. 104)
11:00AM–12 Noon	P–C	209C, MCC	UFOs, Crime Scenes, Mysteries, and More! Family Science Night in Action! (p. 108)
11:00AM–12 Noon	2–4	105A, MCC	Using the Outdoors to Teach Grade 3 Students About Relationships Within an Ecosystem (p. 109)
11:00AM–12 Noon	3–8	105B, MCC	Aerospace Adventurers: Launching an After-School Aeronautics and Space Education Program (p. 109)

Life Science: Saturday

8:00–8:30 AM	7–12	Broadway J, Omni	A Consilient Approach to Interdisciplinary History and Science (p. 16)
8:00–9:00 AM	P–8	106A, MCC	Help! I Don't Know How to Grow Plants in My Classroom (p. 18)
8:00–9:00 AM	6–C	Cumberland 4, Omni	Dragon Genetics and Other Powerful Free Simulations for Biology Teaching (p. 18)
8:00–9:00 AM	5–C	Fisk Two, Renaissance	Deconstructing the Silos of Physical and Life Sciences in Grades 7–12 Classrooms (p. 19)
8:00–9:00 AM	6–8	Broadway D, Omni	At the Core of STEM: A Tale of Integrated Lessons for Middle School Students (p. 22)
8:00–9:00 AM	K–12	Legends G, Omni	Science Explorations with Deaf and Hard of Hearing Students (p. 22)
8:00–9:00 AM	3–7	103A, MCC	All Learners and the NGSS: The Importance of Three-Dimensional Learning and Reasoning (p. 20)
8:00–9:30 AM	12	107A, MCC	AP Environmental: Using Your Stream to Teach STEM-Based Skills (p. 23)
8:00–9:30 AM	6–8	202C, MCC	Tracking Student Growth in Science Practices (p. 24)
8:00–9:30 AM	9–C	212, MCC	Proteins Are the Cash of Biotech (p. 27)
8:00–9:30 AM	6–12	Broadway J, Omni	Coding Contagion: Teaching Computational Thinking and Scientific Modeling by Having Students Develop Simulations of an Outbreak (p. 28)
8:00–9:30 AM	6–12	207B, MCC	Zombie Apocalypse! (p. 25)
8:00–9:30 AM	7–12	207A, MCC	Vampire Chronicles: Sink Your Teeth into Genetics and Blood Typing (p. 25)
8:00–9:30 AM	9–12	205B, MCC	Interactive Case Studies: Supplemental Software to Improve Critical Thinking in the Biology Classroom (p. 24)
9:30–10:00 AM	9–12	Cumberland 4, Omni	Who's Afraid of the Big Idea? Teaching about Ecosystems by Examining Wolves and Their Food Chains (p. 30)
9:30–10:30 AM	3–C	Electric, Omni	ICARUS (p. 34)
9:30–10:30 AM	9–12	Cumberland 3, Omni	Differentiating Life Science NGSS for Lower-Level Students (p. 34)
9:30–10:30 AM	P–C	Grand Blrm. C2, MCC	Paul F-Brandwein Lecture: Love: The Four-Letter Word That Science Forgot (p. 31)

9:30–10:30 AM	*–C	101E, MCC	Students Answer Sustainable Energy Research Questions with Current Science and Engineering Data (p. 35)
9:30–11:30 AM	K–12	Broadway J, Omni	AMSE Session: George W. Carver Conversations Series on Diversity and Equity (p. 38)
10:00–11:30 AM	8–C	214, MCC	Let's Get Helical (p. 42)
10:00–11:30 AM	K–12	108, MCC	Stretch Your Legs for Science! (p. 38)
10:00–11:30 AM	3–8	210, MCC	Engaging Your Students Through the U.S. Fish & Wildlife Service's Conservation Connect (p. 42)
10:00–11:30 AM	5–8	209C, MCC	The REAL Story of the Animal Kingdom on Planet Earth (p. 42)
10:00–11:30 AM	9–C	208A, MCC	NGSS in the High School Biology Classroom (p. 40)
11:00 AM–12 Noon	6–C	Cumberland 4, Omni	Brain Science: Resources for the Classroom (p. 46)
11:00 AM–12 Noon	5–10	101E, MCC	Your Kids Can, Too! Scientific Argumentation for All Students (p. 49)
11:00 AM–12 Noon	K–8	101C, MCC	NSTA Press® Session: <i>Bringing Outdoor Science In</i> (p. 49)
11:00 AM–12 Noon	9–12	106B, MCC	The 6th Mass Extinction: Student Inquiry-based Lessons on the Decline of Earth's Biodiversity (p. 50)
12 Noon–1:30 PM	6–8	209A, MCC	Hands-On Integrated Science Activities for Middle School from Flinn Scientific (p. 54)
12 Noon–1:30 PM	9–C	207C, MCC	Biology with Vernier (p. 54)
12 Noon–1:30 PM	5–C	214, MCC	Constructing and Crossing Cell Membranes (p. 55)
12:30–1:30 PM	7–C	Legends D, Omni	Quick 'n Easy GMO Detection: Engage Students with Real-World Biotechnology and Genetics (p. 63)
12:30–1:30 PM	5–9	105B, MCC	Designing Classroom Assessments to Address NGSS Performance Expectations (p. 58)
12:30–1:30 PM	P–5	105A, MCC	Planting a School Garden on a Shoestring Budget (p. 62)
1:00–1:30 PM	9–C	Electric, Omni	The Environmental Science Summer Research Experience for Young Women (p. 65)
1:00–1:30 PM	6–8	103A, MCC	Explaining Population Dynamics Through the Modeling of Long-Term Data on Hurricane Disturbance in Puerto Rico (p. 64)
1:00–1:30 PM	7–12	East Blrm./Gr 1, Renaissance	Teacher Researcher Day Session: The Effects of Student Collaboration on Performance in a Grade 9 Biology Class (p. 65)
1:00–1:30 PM	6–10	Cumberland 5, Omni	Fish Kill! A Three Dimensional Learning Unit (p. 65)
1:15–1:45 PM	4–10	Broadway A, Omni	Meet Me in the Middle Session: Earworms and Melodies: Teaching Science Through Songs (p. 66)
2:00–3:00 PM	K–3	101 A/B, MCC	Holy Moly Roly Poly! (p. 71)
2:00–3:00 PM	6–8	Broadway H, Omni	EXENTHUNCO (p. 70)
2:00–3:00 PM	6–12	106B, MCC	Participating in the Global Decomposition Project and Using the IMOLD Interactive Model of Leaf Decomposition (p. 72)
2:00–3:00 PM	7–12	Music Row 2, Omni	Using Machine Learning to Measure Learning Progressions and Inform Instruction (p. 71)
2:00–3:30 PM	1–6	207A, MCC	Elementary Science Activity Jamboree (p. 74)
2:00–3:30 PM	7–12	208B, MCC	ECO Classroom: Free Experiential Learning in the Rainforests of Costa Rica (p. 74)
2:00–3:30 PM	9–C	207C, MCC	Human Physiology with Vernier (p. 74)
3:30–4:30 PM	6–12	Cumberland 1, Omni	Differentiating Content, Process, and Product: Examples from Earth History, Ecology, Force and Motion, and Astronomy Units (p. 80)
3:30–4:30 PM	9–12	Mockingbird 4, Omni	Are You a Co-Teacher? Rethinking Roles through a Consult Model (p. 81)
3:30–4:30 PM	9–10	Broadway J, Omni	Open and Guided Inquiry in Biology (p. 80)
3:30–4:30 PM	K–5	104E, MCC	Building Plant Literacy with NGSS and CCSS (p. 82)
3:30–4:30 PM	P–11	105A, MCC	Butterfly Bonanza (p. 82)
3:30–4:30 PM	5–8	105B, MCC	Using the Tools of the NGSS to Reach Girls in Science (p. 82)
3:30–4:30 PM	6–12	106A, MCC	Climate Studies with Global Hawk and NASA Airborne Science (p. 78)
5:00–6:00 PM	9–11	103C, MCC	A Cross-Curricular Contamination Case: Integrating Core Content Through Self-Paced Learning (p. 86)
5:00–6:00 PM	P–8	106A, MCC	The Maker Movement in EC–Grade 8 Classrooms (p. 86)
5:00–6:00 PM	6–8	Broadway G, Omni	Food Chains: Using Field Surveys That Give Real Results (p. 86)
5:00–6:00 PM	6–12	Legends E, Omni	CRASH Science! Investigating the Dangers of Distracted Driving (p. 88)
5:00–6:00 PM	4–10	Fisk Two, Renaissance	The Argumentation Toolkit: The Lawrence Hall of Science Presents a Collection of Multimedia Resources to Support Teacher Learning About Argumentation (p. 90)
5:30–6:00 PM	P–2	104B, MCC	Think It, Map It, Write It, Learn It! (p. 90)

Life Science: Sunday

8:00–9:00 AM	5–8	205B, MCC	Sources of Pedagogical Content Knowledge for Teaching Life Sciences in Middle School (p. 93)
8:00–9:00 AM	6–C	103A, MCC	Is Your Beak Stuck? How to Use the Three Dimensions of the NGSS in a Natural Selection Activity (p. 96)
8:30–9:00 AM	1–5	104A, MCC	Nature on My Block: Place-Based Ecology Lessons for Urban Students (p. 93)
9:30–10:00 AM	P–3	103B, MCC	Planting the Seeds to Cultivate Meaningful Science Practices in Garden Classrooms (p. 98)
9:30–10:00 AM	4–8	106A, MCC	Let's Explore: The Changes That Surround Us (p. 98)
10:00–10:30 AM	K–8	103B, MCC	Building a Learning Garden While Integrating Literacy and Science (p. 104)
9:30–10:30 AM	6–12	105B, MCC	Climate Change Education Inside Out (p. 102)
9:30–10:30 AM	9–12	103A, MCC	From Memorization to Modeling—Reconceptualizing Teaching About Cellular Division (p. 101)
9:30–10:30 AM	9–12	105A, MCC	Cheap Investigations... Priceless Student Learning (p. 102)
9:30–10:30 AM	9–C	202B, MCC	Using Models and Motion for Teaching DNA and Protein Synthesis (p. 102)
9:30–10:30 AM	9–12	202C, MCC	Professional Learning Communities: An Interdisciplinary Collaboration between Secondary Science and Automotive Collision Repair Teachers (p. 102)
10:00–10:30 AM	9–C	101E, MCC	Using Web-Based Resources to Assist Diverse Learners to Learn Scientific Concepts While Engaging in Science Practices (p. 104)
11:00 AM–12 Noon	6–12	103A, MCC	Orchestrating a Scientific Symphony with the Three Dimensions of the NGSS (p. 108)
11:00 AM–12 Noon	5	104D, MCC	Cole's Aquarium: Intentional Integration of Grade 5 Science and Math (p. 108)
11:00 AM–12 Noon	5–8/C	201B, MCC	Duck, Duck, Goose by the Numbers (p. 109)
11:00 AM–12 Noon	6–12	106A, MCC	Climate Change Research on the Arctic Tundra: Lessons and Labs from a Teacher at Toolik Field Station in Alaska (p. 106)
11:00 AM–12 Noon	9–12	202A, MCC	Biomagnification in Ocean Food Webs: You Are What You Eat (p. 109)
11:00 AM–12 Noon	4–8	104E, MCC	Managing Moving Molecules: A Hands-On Modeling Approach to Photosynthesis and Cellular Respiration (p. 108)

Physical Science: Saturday

8:00–8:30 AM	6–12	Broadway A, Omni	Dalton, Curie, Bohr, and More: A Chemistry Unit Outline (p. 16)
8:00–8:30 AM	P–6	101E, MCC	Connecting Interactive Science Notebooks and NGSS Practices: Early Childhood Students Engaging Their Community (p. 15)
8:00–9:00 AM	4–8	101 A/B, MCC	STEMulate Student Learning by Infusing Engineering Design Using the 6 Es (p. 20)
8:00–9:00 AM	P–1	105A, MCC	Fantastic Physical Science for Young Learners! (p. 21)
8:00–9:00 AM	5–C	Fisk Two, Renaissance	Deconstructing the Silos of Physical and Life Sciences in Grades 7–12 Classrooms (p. 19)
8:00–9:00 AM	6–8	Broadway D, Omni	At the Core of STEM: A Tale of Integrated Lessons for Middle School Students (p. 22)
8:00–9:00 AM	K–12	Legends G, Omni	Science Explorations with Deaf and Hard of Hearing Students (p. 22)
8:00–9:30 AM	K–8	110B, MCC	Cereal City Science: Going Great Lengths Toward the NGSS (p. 24)
8:00–9:30 AM	9–C	207C, MCC	Chemistry with Vernier (p. 26)
8:00–9:30 AM	6–8	202C, MCC	Tracking Student Growth in Science Practices (p. 24)
8:00–9:30 AM	2–8	208B, MCC	Circuits as Crayons: Crafting Interactive Circuits with Circuit Stickers (p. 26)
8:00–9:30 AM	9–12	210, MCC	<i>Living By Chemistry</i> : Pass the Proton—Acids and Bases (p. 26)
8:30–9:00 AM	7–12	Broadway A, Omni	Simple Use of Scientific Models in High School Chemistry and Physical Science (p. 28)
9:30–10:30 AM	1–9	104E, MCC	Bringing Engineering, Technology, and Applications of Science into the Elementary and Middle School Classroom (p. 35)
9:30–10:30 AM	7–C	105A, MCC	Black Holes Suck! (p. 35)
9:30–10:30 AM	K–12	Mockingbird 4, Omni	Students Solving Real-World Problems (p. 34)
10:00–11:30 AM	2–8	202A, MCC	3-2-1 Blast Off! (p. 39)
10:00–11:30 AM	6–12	212, MCC	A Peek Behind the Curtain: Disney Parks Approach to Physics and Energy (p. 42)
10:00–11:30 AM	9–C	207C, MCC	Inquiry-Based Chemistry with Vernier (p. 40)
10:00–11:30 AM	9–12	209A, MCC	Enhance Your AP Chemistry Course with POGIL™ Activities (p. 41)
10:00–11:30 AM	6–8	205C, MCC	Waves (p. 40)
10:00–11:30 AM	9–12	206 A/B, MCC	Collisions™: Reconceptualizing Chemistry Through Gameplay (p. 40)

10:00–11:30 AM	9–C	208A, MCC	NGSS in the High School Biology Classroom (p. 40)
11:00AM–12 Noon	4–7	103C, MCC	Come Fly with Us! (p. 49)
11:00AM–12 Noon	6–8	106C, MCC	Ocean Plastic Pollution: Examining Issues and Solutions in a Middle School Classroom (p. 50)
11:00AM–12 Noon	K–2	104B, MCC	Sensing Science: Temperature and Heat Readiness for Early Elementary Students (p. 46)
11:00AM–12 Noon	5–10	Electric, Omni	Debatable Demos (p. 47)
11:00AM–12 Noon	9–12	Broadway A, Omni	Trials and Tribulations of Project-Based Learning: A Chemistry Team’s Vignette (p. 46)
11:00AM–12 Noon	P–3	105A, MCC	Let’s Get Physical: From Force and Friction to Water and Weather (p. 50)
11:30AM–12 Noon	P–2	East Blrm./Gr 3, Renaissance	Teacher Researcher Day Session: Physical Science Understanding in the Young Learner (p. 53)
12 Noon–1:30 PM	11–12	107B, MCC	Spicing Up Classical Physics Using Modern Examples (p. 53)
12 Noon–1:30 PM	5–C	214, MCC	Constructing and Crossing Cell Membranes (p. 55)
12 Noon–1:30 PM	6–8	209A, MCC	Hands-On Integrated Science Activities for Middle School from Flinn Scientific (p. 54)
12 Noon–1:30 PM	9–12	202B, MCC	Sparking Interest with Chemistry (p. 54)
12 Noon–1:30 PM	9–12	207A, MCC	Let Motion Show How Cars May Really Drive Themselves in the Future with the ERGOBOT! (p. 54)
12 Noon–1:30 PM	9–C	207D, MCC	Physics with Vernier (p. 54)
12:30–1:00 PM	5–9	103A, MCC	Warm the Water to Save Your City: An Engineering and Educational Technology NGSS Student Assessment Task (p. 56)
12:30–1:00 PM	6–8	Broadway D, Omni	Meet Me in the Middle Session: Engineering Practice in Middle School Chemistry (p. 58)
12:30–1:00 PM	8–12	Music Row 1, Omni	Chemical Action-based Curriculum (p. 57)
12:30–1:30 PM	5–12	Fisk Two, Renaissance	Problem Solving Through Observation: The Mystery of Three Turning Dots (p. 61)
12:30–1:30 PM	6–12	Broadway H, Omni	Dive into Engineering Design: Connecting Physical Science and Engineering Through Underwater Robotics (p. 60)
12:30–1:30 PM	6–12	Cumberland 2, Omni	Meeting the NGSS... Even When You Don’t Have To (p. 60)
12:30–1:30 PM	5–9	105B, MCC	Designing Classroom Assessments to Address NGSS Performance Expectations (p. 58)
12:30–1:30 PM	4–5	104E, MCC	Universal Design for Learning: A Powerful Way to Teach Electric Currents (p. 62)
12:30–1:30 PM	9–C	Legends B, Omni	Using Modeling Activities in the High School Chemistry Class (p. 62)
12:30–1:30 PM	P–12	101 A/B, MCC	NASA Aeronautics 101: Over a Century of Flight (p. 61)
12:30–1:30 PM	3–8	Music Row 5, Omni	Using Models to Make All Students’ Thinking Visible and Revisable (p. 64)
12:30–1:30 PM	K–12	West Blrm., Renaissance	Three Dimensions, Vertical Alignment, and STEM: Sequential Skill Building for Student Success (p. 61)
12:30–1:30 PM	3–C	Center Blrm., Renaissance	Exploring Light and Color: Hands-On NGSS-Based Investigations from the Exploratorium (p. 64)
1:00–1:30 PM	6–10	Music Row 1, Omni	Bringing STEAM and Literacy to the Periodic Table (p. 65)
1:15–1:45 PM	4–10	Broadway A, Omni	Meet Me in the Middle Session: Earworms and Melodies: Teaching Science Through Songs (p. 66)
2:00–3:00 PM	4–8	101E, MCC	Designing Animals to Survive Cold Temperatures (p. 71)
2:00–3:00 PM	10–12	105B, MCC	Engaging Chemistry Students Through Forensics Investigations (p. 72)
2:00–3:30 PM	1–6	207A, MCC	Elementary Science Activity Jamboree (p. 74)
3:30–4:30 PM	6–12	Cumberland 1, Omni	Differentiating Content, Process, and Product: Examples from Earth History, Ecology, Force and Motion, and Astronomy Units (p. 80)
3:30–4:30 PM	5–10	Legends C, Omni	Using Paper Airplane Design to Teach Scientific Investigations and the NGSS Engineering Practices (p. 83)
3:30–4:30 PM	8–12	Cumberland 3, Omni	Mastery Learning that Provides Choice and Changes Perception (p. 80)
3:30–4:30 PM	1–5	104C, MCC	Rhythm and Blues: Exploring the Science of Sound (p. 82)
3:30–4:30 PM	5–8	105B, MCC	Using the Tools of the NGSS to Reach Girls in Science (p. 82)
3:30–4:30 PM	9–12	Legends B, Omni	Arts and Science: Spark Timers, Glue, and Scissors to Study Motion (p. 83)
3:30–4:30 PM	P–6	106B, MCC	Keeping Things in Motion using NASA and Newton’s Laws (p. 83)
4:00–5:30 PM	K–8	207A, MCC	Physics of Music (p. 84)
5:00–5:30 PM	9–12	Cumberland 1, Omni	Using Video Technology to Analyze Motion in a Physics Classroom (p. 84)
5:00–6:00 PM	9–11	103C, MCC	A Cross-Curricular Contamination Case: Integrating Core Content Through Self-Paced Learning (p. 86)
5:00–6:00 PM	P–8	106A, MCC	The Maker Movement in EC–Grade 8 Classrooms (p. 86)

Schedule at a Glance Physical Science

5:00–6:00 PM	P–2	104C, MCC	Ramps and Pathways: An Integrated STEM Activity (p. 88)
5:00–6:00 PM	3–8	104E, MCC	Sound and Waves: An Integrated K–8 Hands-On Approach Supporting the NGSS and CCSS ELA (p. 88)
5:00–6:00 PM	4–12	Legends A, Omni	Riding the Waves (p. 88)
5:00–6:00 PM	6–12	Legends E, Omni	CRASH Science! Investigating the Dangers of Distracted Driving (p. 88)
5:30–6:00 PM	P–2	104B, MCC	Think It, Map It, Write It, Learn It! (p. 90)
5:30–6:00 PM	8–12	Music Row 1, Omni	Are You Bohr'd with Bonding? (p. 90)

Physical Science: Sunday

8:00–9:00 AM	7–12	205A, MCC	Science Is a Social Endeavor: Scientific Inquiry Through Collaborative Work (p. 97)
8:00–9:00 AM	K–12	202B, MCC	Illuminate Intelligence with Creative Circuits (p. 97)
8:00–9:00 AM	9–12	207C, MCC	Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events (p. 94)
8:00–9:00 AM	9–12	201B, MCC	Hot Topics Workshop: Nuclear Energy (p. 97)
9:30–10:00 AM	4–8	106A, MCC	Let's Explore: The Changes That Surround Us (p. 98)
9:30–10:30 AM	6–12	207B, MCC	Integrating Reading and Math in the Science Curriculum to Increase Student Achievement (p. 100)
9:30–10:30 AM	9–12	202C, MCC	Professional Learning Communities: An Interdisciplinary Collaboration between Secondary Science and Automotive Collision Repair Teachers (p. 102)
9:30–10:30 AM	6–12	209B, MCC	Something Worth Writing About: Using Literacy Techniques to Engage More Students in STEM (p. 104)
9:30–10:30 AM	3–5	104E, MCC	It's Magnetic! Using Mathematics to Enhance Science Learning (p. 101)
9:30–10:30 AM	7–12	208B, MCC	From Silos to STEM: Developing Real Thinkers (p. 104)
10:00–10:30 AM	9–C	101E, MCC	Using Web-Based Resources to Assist Diverse Learners to Learn Scientific Concepts While Engaging in Science Practices (p. 104)
11:00AM–12 Noon	10–12	101C, MCC	NSTA Press® Session: Forensics in Chemistry (p. 105)
11:00AM–12 Noon	5–12	103B, MCC	Energize Your Classroom while Teaching Tough Science Concepts (p. 108)
11:00AM–12 Noon	6–8	205B, MCC	Integrating Digital Games into Instruction to Address Crosscutting Concepts (p. 106)
11:00AM–12 Noon	9–C	202B, MCC	Science and Engineering Practices in the Chemistry Classroom (p. 109)



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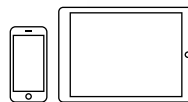
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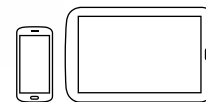
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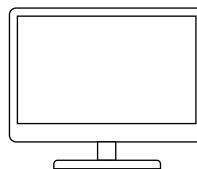
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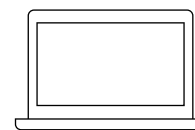
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