

Saturday & Sunday, April 1 & 2

# NSTA National Conference on Science Education



VOLUME 3

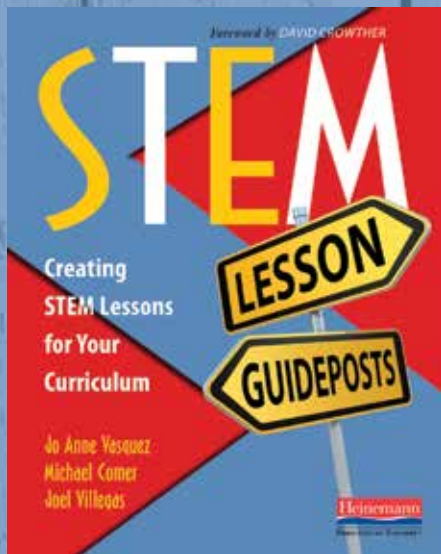
NATIONAL SCIENCE TEACHERS ASSOCIATION • LOS ANGELES 2017

3

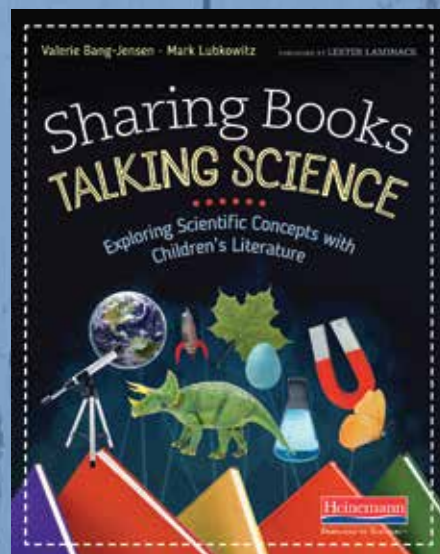
#NSTA17

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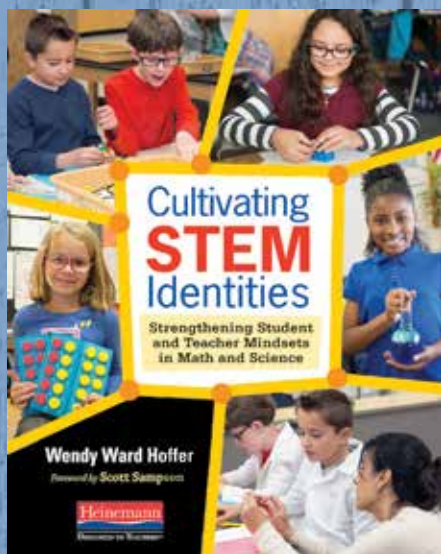
# Authentic, Practical Resources for Teachers



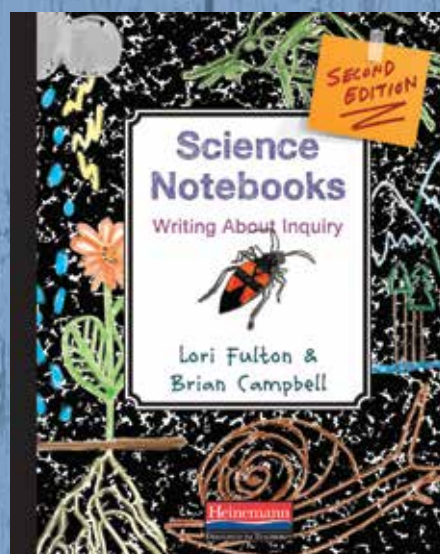
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## STORE HOURS

Wednesday, March 29	4:00 PM–7:00 PM
Thursday, March 30	7:30 AM–5:00 PM
Friday, March 31	7:30 AM–5:30 PM
Saturday, April 1	7:30 AM–4:00 PM
Saturday, April 2	8:00 AM–12:30 PM

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**NSTA 65th National Conference  
on Science Education**  
*Sun, Surf & Science*

Los Angeles, California • March 30–April 2, 2017

**Volume 3** Saturday and Sunday, April 1–2

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**National Science Teachers Association**

1840 Wilson Blvd.  
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[www.nsta.org](http://www.nsta.org)



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# NGSS@NSTA Forum

The Best Place to Explore  
**Assessments** and the  
**NEXT GENERATION  
SCIENCE STANDARDS**

**Friday, March 31, 2017**  
**Los Angeles Convention Center, 151**

**Take a deep dive with a special event FREE to all conference attendees!**

Join leading national experts as they discuss issues around classroom and large-scale assessments in the context of three-dimensional instruction. Participate in one or more presentations.

8:00 AM–9:00 AM

**Designing and Using Classroom Assessments to Support Meaningful NGSS Investigations**

Philip Bell, Shelley Stromholt, Deb Morrison

9:30 AM–10:30 AM

**Next Generation Science Assessments (NGSA) Project**

Joseph Krajcik, Christopher Harris

11:00 AM–12 PM

**How Do You Know If an Assessment Is Measuring Three-Dimensional Reasoning?**

Jill Wertheim, Cathy Zozakiewicz

12:30 PM–1:30 PM

**How Do We Grade Students in a Three-Dimensional Classroom?**

James Clark, Samantha Johnson

2:00 PM–3:00 PM

**Developing a Coherent Assessment System From the Classroom to the Year-End Exam**

Stephen Pruitt

3:30 PM–4:30 PM

**The Next Generation of Statewide Assessments**

Michelle Center, Peter McLaren, Stephen Pruitt

## SHARE-A-THON

**Saturday, April 1, 2017**  
**9:30–11:00 AM**  
**Los Angeles Convention Center, 151**

Get tips and tools to implement three-dimensional standards from NSTA's NGSS Curators, NGSS writers, and other national education experts.

Leave with plenty of resources and ideas you can use in your classroom right away!

**NGSS@NSTA**  
STEM STARTS HERE

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Photo courtesy of © Los Angeles Convention Center



**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 1**

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The Los Angeles 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.

### **NGSS** **NGSS: The Next Generation of Science Teaching**

Celebrate the vision of three-dimensional teaching and learning in the NRC *Framework* and *Next Generation Science Standards (NGSS)*. This strand provides engaging and collaborative examination of the NGSS architecture to allow teachers to implement the changes necessary to construct a coherent program, including classroom practice and instructional sequence, as well as to build student skills. Bundling performance expectations connects the three key dimensions within a progression. This strand will focus on providing opportunities for students to collaborate as they develop and use science and engineering practices, communicate evidence of core scientific understanding, and apply real-world contexts. Alignment of assessments connecting core concepts, science and engineering practices, and crosscutting concepts is essential.



### **2017: A STEM Odyssey**

Students' science learning has changed dramatically from learning in the past. In a STEM environment, students' understanding of the world around them is facilitated through the intentional connections between the four disciplines of science, technology, engineering, and mathematics. STEM curriculum provides research-based instructional strategies that engage diverse learners and highlights career pathways in STEM-related fields. More importantly, STEM provides opportunities for all students to place themselves in a 21st-century world. In this strand, participants will connect and collaborate to increase their understanding and ability to teach STEM-based lessons and instructional sequences.



### **Science & Literacy Reloaded**

With the continued emphasis on mathematics and language arts, elementary teachers have not been encouraged or given opportunities to teach science. This strand will support these teachers in seeing the connections between science and literacy. Elementary science will be re-envisioned as an opportunity for authentic language learning and not just one more thing to squeeze into the curriculum. As students investigate natural phenomena, they collect data to then make claims from their evidence and explain their reasoning, arguing from their evidence. Teachers can then support their students' language and literacy through science notebooks, technical writing, interactive journals, and e-portfolios. This strand will allow teachers to become advocates of literacy in science, blending oral and written communication skills within the science curriculum.



### **Mission Possible: Equity for Universal Access**

Access to science education is not a privilege; it is a right for students of all abilities, genders, languages, socioeconomic status, and geographic locations. A quality science education is essential in closing the skills gap in our current workforce. Science learning must start in early childhood and be sustained through postsecondary education to keep our nation as a leader in innovation. Current challenges provide opportunities for equitable access to science education. Some issues include maximizing student achievement for exceptional students while respecting cultural and linguistic diversity in order to celebrate those differences. The sessions in this strand will focus on pedagogical best practices to enhance learning for ALL.



**NGSS: The Next Generation of Science Teaching**

**Saturday, April 1**

**8:00–9:00 AM**

Creating Inquiry Lessons Using NGSS

**9:30–10:30 AM**

Yes, Humans Really Do Cause Earthquakes: Hydraulic Fracturing, Wastewater Injection, and Earthquakes

**11:00 AM–12 Noon**

Analyzing and Adapting Curriculum Materials to Better Support Three-Dimensional Teaching and Learning

**12:30–1:30 PM**

NGSS 3-D Implementation: Tools for Middle School and High School Teachers

**2:00–3:00 PM**

Using Scientific Phenomena to Understand the Three Dimensions of the NGSS

**3:30–4:30 PM**

The Essentials of High-Quality NGSS Implementation for All Students

**5:00–6:00 PM**

Developing Tools for Three-Dimensional Classroom Assessment

**Sunday, April 2**

**8:00–9:00 AM**

Creating Life Science Assessment Tasks That Integrate Three-Dimensional Learning of the NGSS

**9:30–10:00 AM**

EQuIP Rubric: A Formative Assessment Tool in Creating NGSS Lessons

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**2017: A STEM Odyssey**

**Saturday, April 1**

**8:00–9:00 AM**

The Science Collective: Project-Based Learning as a Multi-Science Teacher

**9:30–10:30 AM**

STEAMING Along with DaVinci: Integrating Science and Engineering with the Arts in an Elementary Classroom

**11:00 AM–12 Noon**

Using Robots to Teach Science, Math, Art, and Language Arts

**12:30–1:30 PM**

Engaging Multilingual Students and Their Families in STEM

**2:00–3:00 PM**

How to Create a Network and Supply Chain to Support Collaborative Biotechnology Education

**3:00–6:00 PM**

Short Course: Kids Love Rocks, So Will You: Introducing Physical Science BIG IDEAS (By Ticket: SC-15)

**3:30–4:30 PM**

Inquiry—Without Reinventing the Wheel

**5:00–5:30 PM**

A STEM Approach to Integrate Drones as a Teaching and Technology Tool

**Sunday, April 2**

**9:30–10:00 AM**

Using 3D Printers in Your Science Classroom

**10:00–10:30 AM**

Using 3D Printers in K–3 to Boost Student Engagement and Learning

**11:00 AM–12 Noon**

Early Elementary STEM Curriculum

**Science & Literacy Reloaded**

**Saturday, April 1**

**8:00–11:00 AM**

Short Course: Fostering a Science-Driven Language and Literacy Learning Environment (By Ticket: SC-11)

**9:30–10:30 AM**

Urban-Based Partnerships to Support the K–6 Foundations of *CCSS ELA* and *NGSS*

**11:00 AM–12 Noon**

Promoting Elementary Science Literacy in Three Dimensions with the 2017 U.S. Total Solar Eclipse

**12:30–1:30 PM**

Engaging All Learners in Inquiry Through a Model of Shared Language

**4:00–4:30 PM**

A Response to Intervention Model for Argument-Based Inquiry: The Importance of Using Student Writing to Find Out What They Really Know

**5:00–5:30 PM**

Poetry for Young Investigators

**Sunday, April 2**

**8:00–9:00 AM**

Removing Literacy Barriers to Rigorous STEM Units

**9:30–10:30 AM**

Where Will Yoni the Chickadee Raise His Family?

**11:00–11:30 AM**

Growing a Garden of Science and Literacy

**11:30 AM–12 Noon**

Science Notebooks Reloaded

**Mission Possible: Equity for Universal Access**

**Saturday, April 1**

**8:00–9:00 AM**

Support English Language Learners in STEM Education Through Engagement in Engineering Challenges

**9:30–10:30 AM**

Science Coding: Combining Science and Computational Thinking

**11:00 AM–12 Noon**

How Engineering Practices Differentiate for Students with Learning Disabilities

**12:30–1:30 PM**

Featured Presentation: Reenvisioning STEM Education: Transcending Boundaries to Realize the Vision of Inclusion, Diversity, and Equity in STEM Fields (Featured Speaker: Roni Ellington)

**2:00–3:00 PM**

How and Why STEM Career Interest Changes in High School

**3:00–6:00 PM**

Short Course: Hands-On Mathematics in Science Education (By Ticket: SC-16)

**3:30–4:30 PM**

Exploring Engineering Design with Elementary and Preservice Teams Through Distance Technology: Edible Lunar Vehicle

**5:00–6:00 PM**

4-H Follow a Researcher™

**Sunday, April 2**

**8:00–9:00 AM**

Coding Curriculum for K–6 Students

**9:30–10:00 AM**

Differentiating for the Differentiated: Lab Experiences for General Level Life Science Students

**10:00–10:30 AM**

STEM for ALL: Dream IT, Design IT, Develop IT

# Inspire Students *Spark Innovation*

Visit Booth #2343

Inspire your students and spark innovation with K-12 programs that make science real and relevant. With exciting hands-on activities, inquiry-based learning, and engaging tech-enhanced resources, our programs help teachers excel at delivering NGSS\* instruction that empowers future science innovators.

Explore our K-12 science programs and NSTA conference activities at [mheonline.com/NSTA2017](http://mheonline.com/NSTA2017)

\*Next Generation Science Standards (NGSS) is a registered trademark of Achieve. Neither Achieve nor the lead states and partners that developed NGSS endorse or are involved in the production of McGraw-Hill Education products.

## Science in the Community Saturday Event

The Science in the Community Forums and events build awareness of the abundance of existing high-quality out-of-school (informal) science education methods, resources, and opportunities available to enhance science teaching and learning. Both out-of-school and in-school science educators meet and interact to share best practices in informal science, learn about exciting collaborations happening among informal and formal science organizations, network with colleagues, and dialogue around ideas and innovations. Informal organizations participating in the Science in the Community Forums include zoos, museums, media, after-school programs, universities outreach, and others that provide or support out-of-school science education.

12:30–2:30 PM Using Informal Science Experiences to Explore Environmental Issues (p. 60)

## NGSS@NSTA STEM STARTS HERE

### NGSS@NSTA Share-a-Thon

Saturday, April 1, 9:30–11:00 AM  
151, Convention Center

At the NGSS@NSTA 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! (p. 36)

# NSTA 2018 National Conference on Science Education

Atlanta, GA • March 15 – 18, 2018

## SHARE YOUR IDEAS!

Have an idea for an inspiring presentation or workshop on science education? Submit a session proposal today.

Proposal Deadline:

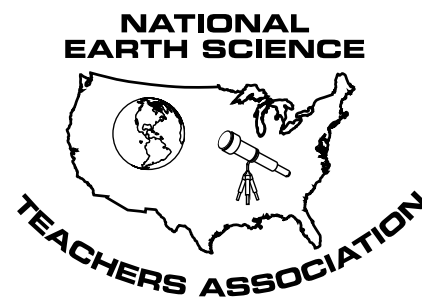
**4/17/2017**



To submit a proposal, visit  
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# National Earth Science Teachers Association Events at the 2017 NSTA National Conference in Los Angeles



We have a number of exciting sessions! To find our sessions, enter **NESTA** as the keyword when searching events online at NSTA's session browser for the conference. On Friday, March 31 and Saturday, April 1, we have a series of sessions all in Petree Hall D of the Los Angeles Convention Center. Don't miss out on our Share-a-Thons and the events below!

[www.nestanet.org](http://www.nestanet.org)

## Friday, March 31

2:00 – 3:00 p.m. **American Geophysical Union (AGU) Lecture: The Fault Lies Not in Our Stars. Speaker: Dr. Lucy Jones**



*Seismology shows us that on human time scales, the timing of big earthquakes is random and the best way to manage the risk is to consider it probabilistically. Most people do not really believe in randomness—trying to find patterns even when they don't exist and then expecting scientists to find the real cause and remove randomness from the equation. Dr. Jones will probe how science education can do a better job of empowering everyone to understand and use hazards information.*

Los Angeles Convention Center, Petree Hall C

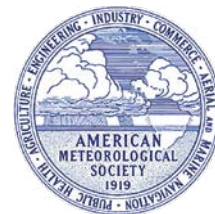
6:30 – 8:00 p.m. **NESTA Friends of Earth Science Reception**  
JW Marriot Hotel L.A., Platinum Ballroom Salon C

## Saturday, April 1

5:00 – 6:00 p.m. **NESTA's exciting Rock, Mineral, and Fossil Raffle!**

Los Angeles Convention Center, Petree Hall D

*NESTA gratefully acknowledges the following organizations as sponsors:*



## 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 1

#### 8:00–9:00 AM

Planning Three-Dimensional Formative Assessments with the Feedback Loop

#### 9:30–10:30 AM

Solar Science = NGSS-Focused Solar Astronomy Experiences + Preparation for the All American Total Solar Eclipse

#### 11:00 AM–12 Noon

*Outdoor Science: A Practical Guide*

#### 12:30–1:30 PM

*Be a Winner! A Science Teacher's Guide to Writing Successful Grant Proposals*

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

Bringing the S-T-E-M Together in Early Childhood Using Science and Engineering Practices

#### 2:00–3:00 PM

Inside or Out: The Perfect Place for Connecting Outdoor Science and Children's Trade Books

#### 3:30–4:30 PM

Everyday Engineering

### Sunday, April 2

#### 8:00–9:00 AM

*Problem-Based Learning in the Classroom, K–12*

#### 9:30–10:30 AM

Helping Your Students (and You!) Achieve Basic Data Literacy



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

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

## 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><b>PS1: Matter and Its Interactions</b>                      PS1.A: Structure and Properties of Matter                      PS1.B: Chemical Reactions                      PS1.C: Nuclear Processes</p> <p><b>PS2: Motion and Stability: Forces and Interactions</b>                      PS2.A: Forces and Motion                      PS2.B: Types of Interactions                      PS2.C: Stability and Instability in Physical Systems</p> <p><b>PS3: Energy</b>                      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><b>PS4: Waves and Their Applications in Technologies for Information Transfer</b>                      PS4.A: Wave Properties                      PS4.B: Electromagnetic Radiation                      PS4.C: Information Technologies and Instrumentation</p>	<p><b>LS1: From Molecules to Organisms: Structures and Processes</b>                      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><b>LS2: Ecosystems: Interactions, Energy, and Dynamics</b>                      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><b>LS3: Heredity: Inheritance and Variation of Traits</b>                      LS3.A: Inheritance of Traits                      LS3.B: Variation of Traits</p> <p><b>LS4: Biological Evolution: Unity and Diversity</b>                      LS4.A: Evidence of Common Ancestry and Diversity                      LS4.B: Natural Selection                      LS4.C: Adaptation                      LS4.D: Biodiversity and Humans</p>	<p><b>ESS1: Earth's Place in the Universe</b>                      ESS1.A: The Universe and Its Stars                      ESS1.B: Earth and the Solar System                      ESS1.C: The History of Planet Earth</p> <p><b>ESS2: Earth's Systems</b>                      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><b>ESS3: Earth and Human Activity</b>                      ESS3.A: Natural Resources                      ESS3.B: Natural Hazards                      ESS3.C: Human Impacts on Earth Systems                      ESS3.D: Global Climate Change</p>	<p><b>ETS1: Engineering Design</b>                      ETS1.A: Defining and Delimiting an Engineering Problem                      ETS1.B: Developing Possible Solutions                      ETS1.C: Optimizing the Design Solution</p> <p><b>ETS2: Links Among Engineering, Technology, Science, and Society</b>                      ETS2.A: Interdependence of Science, Engineering, and Technology                      ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World</p>



—Photo courtesy of California Science Center

In 2012, the California Science Center opened the Samuel Oschin Pavilion to house the Space Shuttle *Endeavour*. In 2015, the largest and heaviest element of the Space Shuttle, the last remaining External Tank (ET), was sent to the museum to be part of the display.



## 7:00–9:00 AM Meeting

### APAST Breakfast/Business Meeting

(By Invitation Only) Diamond Ballroom Salon 1, JW Marriott

## 7:30–8:15 AM Networking Opportunity

### NSTA Past Presidents' Breakfast

(By Invitation Only) Gold Ballroom Salon 4, JW Marriott

## 8:00–8:30 AM Presentations

### STEM with Sharks: Leveraging the Ocean to Teach Next Generation Science Standards

(Grades K–8) 505, Convention Center  
Science Focus: ESS3, ETS, LS1.B, LS2, LS3, LS4.A, LS4.C, INF

**Lindsay Laughner** (@linds4fins; llaughner@gmail.com), OCEARCH, Montgomery Village, Md.

Bringing NGSS into the classroom by exploring the world's oceans and apex predators through Science, Technology, Engineering, and Math subjects. Learn how students and teachers can use technology, such as the OCEARCH Global Shark Tracker, to track sharks and to explore the oceans and its inhabitants.

### STEM in a Blender

(Grades 3–6) 506, Convention Center  
Science Focus: ETS

**Matt Pederson** (matthew\_pederson@eatonville.wednet.edu), **Tricia Whitted**, and **Amy Sturdivant** (amy\_sturdivant@eatonville.wednet.edu), Weyerhaeuser Elementary School, Eatonville, Wash.

Learn how four dynamic elementary teachers design and implement an innovative program that integrates STEM, ELA, and thematic units in a mixed-age environment.

### Unpacking a K–5 Inquiry-Based Science Investigation with a Focus on Engaging English Language Learners

(Grades K–5) Kentia Hall G, Convention Center  
Science Focus: GEN

**May Lee** (mhl11@psu.edu) and **LeeAnna Hooper** (lkh5212@psu.edu), Penn State, University Park, Pa.

Explore innovative ways to meet the needs of English language learners through unpacking a K–5 inquiry-based science investigation in a culturally responsive way.

## 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 103, you will find the conference sessions grouped according to their assigned science area category.

The science areas and their abbreviations are:

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

## NGSS

See page 13 for a complete list of the NGSS codes used in this program.

## Strands

The Los Angeles 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.

**NGSS** NGSS: The Next Generation of Science Teaching



2017: A STEM Odyssey



Science & Literacy Reloaded



Mission Possible: Equity for Universal Access

The following icons will be used throughout this program.



NSTA Press® Sessions



PLI Professional Learning Institutes



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

### High-Altitude Ballooning for Middle School and High School Students

(Grades 6–12) *Kentia Hall N, Convention Center*  
Science Focus: ETS, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8

**Robert Ferrell** ([robert.ferrell@appo.k12.de.us](mailto:robert.ferrell@appo.k12.de.us)) and **Michael Oberly** ([michael.oberly@appo.k12.de.us](mailto:michael.oberly@appo.k12.de.us)), Louis L. Redding Middle School, Middletown, Del.

Learn how to successfully launch and retrieve payloads engineered by your students into the stratosphere. In the 21st century, the sky is truly the limit!

### Biology and Chemistry Experiments Reloaded with Cutting-Edge Technology

(Grades 10–College) *Kentia Hall O, Convention Center*  
Science Focus: LS, PS

**Paula Daurat** ([pdaurat@hotmail.com](mailto:pdaurat@hotmail.com)) and **Patricia Benmergui** ([patricia.benmergui@sanandres.esc.edu.ar](mailto:patricia.benmergui@sanandres.esc.edu.ar)), St. Andrew's Scots School, Olivos, Argentina

Join us as we share the use of color spaces applications (RGB parameters) in biology and chemistry experiments—Beer's Law, oxidation of fruits, Maillard, Photosynthesis reloaded!



### 8:00–9:00 AM Presentations

#### NSELA-Sponsored Session: Engineering Cafe

(Grades K–5) *Atrium 3, JW Marriott*  
Science Focus: ETS

**Shana Tirado** ([shana.tirado@sdhc.k12.fl.us](mailto:shana.tirado@sdhc.k12.fl.us)) and **Michele Wiehagen** ([michele.wiehagen@sdhc.k12.fl.us](mailto:michele.wiehagen@sdhc.k12.fl.us)), Hillsborough County Public Schools, Tampa, Fla.

Hear how this cafe provides teachers, administrators, and district leaders with a menu of choices so that all students will have access to STEM.

#### Advanced Student Thinking Through Interactive Notebooks with NGSS

(Grades 7–12) *Gold Ballroom Salon 2, JW Marriott*  
Science Focus: GEN, NGSS

**Jennifer Weibert** ([jweibert@fcoe.org](mailto:jweibert@fcoe.org)), Fresno County Office of Education, Fresno, Calif.

Increase rigor in your classroom with a focus on the synthesis of student learning using outputs and Webb's Depth of Knowledge. NGSS notebook examples will be shown.

#### Helping Students Engage in Public Discourse About Change in Science and Engineering Thought Over Time

(Grades 2–6, College) *Olympic 1, JW Marriott*  
Science Focus: GEN, CCC7, SEP1, SEP6, SEP7, SEP8

**Kate Baird** ([katebaird1430@gmail.com](mailto:katebaird1430@gmail.com)), Indiana University–Purdue University Columbus

**Stephanie Coy** ([stephanie.coy@mnps.org](mailto:stephanie.coy@mnps.org)), Inglewood Elementary School, Nashville, Tenn.

Students' struggle with understanding science is ever changing. We describe how students use performance and debate to demonstrate time and place's impact on scientific thinking.

#### AMSE-Sponsored Session: Moving Equity Forward in Science Classrooms: Strategies for Developing Justice-Centered Science Teacher Learning Communities

(Grades 3–College) *Platinum Ballroom Salon A, JW Marriott*  
Science Focus: GEN, NGSS

**Deb Morrison** ([@educatordeb](mailto:@educatordeb); [educator.deb@gmail.com](mailto:educator.deb@gmail.com)), University of Washington, Seattle

**Michael Nocella** ([micnoc@d219.org](mailto:micnoc@d219.org)), Niles West High School, Skokie, Ill.

Come explore research-based strategies for engaging in teacher professional development on equity and justice-oriented classroom practices. All examples engage teachers in practice-based inquiry.

# Saturday, April 1

	Featured Speakers	Special Sessions	Special Sessions	Special Events
7:00 AM				
8:00 AM				
9:00 AM			<p><b>NESTA and NSTA Aerospace Education Advisory Board Space Science Share-a-Thon</b> 8:00–9:00 AM Petree Hall D, Conv. Center</p>	
10:00 AM	<p><b>Featured Presentation</b> 9:30–10:30 AM Theatre (411), Conv. Center Speaker: Veerabhadran Ramanathan</p>	<p><b>NGSS@NSTA Share-a-Thon</b> 9:30–11:00 AM 151, Conv. Center</p>		<p><b>Hydrogen Horizon Automotive Challenge</b> 9:30 AM–1:30 PM at Horizon Educational Booth in Exhibit Hall, Conv. Center</p>
11:00 AM	<p><b>Paul F-Brandwein Lecture</b> 11:00 AM–12 Noon Petree Hall C, Conv. Center Speaker: Emma Marris</p>		<p><b>High School Hands-On Hodge-Podge Share-a-Thon</b> 11:00 AM–12:30 PM 152, Conv. Center</p>	
12 Noon				
1:00 PM	<p><b>Featured Presentation</b> 12:30–1:30 PM Theatre (411), Conv. Center Speaker: Roni Ellington <i>Sponsored by Shell</i></p>	<p><b>Science in the Community Session:</b> <i>Using Informal Science Experiences to Explore Environmental Issues</i> 12:30–2:30 PM 151, Conv. Center</p>	<p><b>Multicultural/Equity Share-a-Thon</b> 12:30–2:30 PM Gold Ballroom Salon 3 JW Marriott</p>	
2:00 PM				
3:00 PM	<p><b>NSTA/ASE Honors Lecture</b> 2:00–3:00 PM 506, Conv. Center Speaker: Chris Colclough</p>			
4:00 PM	<p><b>Featured Presentation</b> 3:30–4:30 PM Theatre (411), Conv. Center Speaker: Louie Lopez</p>		<p><b>Award-Winning Share-a-Thon: Featuring NSTA Distinguished Teachers</b> 3:30–4:30 PM 152, Conv. Center</p>	
5:00 PM				
6:00 PM				
7:00 PM				
8:00 PM				
9:00 PM				
10:00 PM				



**Spark Students' Curiosity with Chemistry!***(Grades K–12) Platinum Ballroom Salon E, JW Marriott*

Science Focus: PS

**Karen Kaleuati** ([k\\_kaleuati@acs.org](mailto:k_kaleuati@acs.org)), American Chemical Society, Washington, D.C.

Did you know that the American Chemical Society (ACS) has resources for K–12 teachers, and you don't need to be a member? Learn about these free resources, including games, lesson plans, grants, and more.

**Branching Out with STEM: Undergraduate Research as a Collaborative Model for K–12 Students Investigating GMOs***(General) Platinum Ballroom Salon H, JW Marriott*

Science Focus: LS3.A, LS3.B, SEP1, SEP3, SEP4, SEP8

**Tara Turley-Stoulig** ([tturley@selu.edu](mailto:tturley@selu.edu)) and **Natalie Lorena** ([natalie.lorena@selu.edu](mailto:natalie.lorena@selu.edu)), Southeastern Louisiana University, Hammond

We will share an approach of student exposure to technologies in rapidly advancing fields involving GMO investigation and scientific literacy that created broad impact at progressive STEM levels.

**Are Students Scientists?***(General) Platinum Ballroom Salon I, JW Marriott*

Science Focus: GEN

**Tristan MacLean**, Keep on Questioning, Ithaca, N.Y.

Does science education foster and nurture the questioning and investigative skills of scientific discovery or does it neglect these to focus on skills and facts?

**Urban STEM-ification***(General) Platinum Ballroom Salon J, JW Marriott*

Science Focus: ETS

**Sally Creel** ([@STEMSally](mailto:@STEMSally); [sally.creel@cobbk12.org](mailto:sally.creel@cobbk12.org)), Cobb County School District, Marietta, Ga.

Join me as I share our journey toward infusing STEM into a large urban school district in Metro-Atlanta. We will share and discuss what worked and what didn't along the way. Resources such as timelines, frameworks, and district STEM certification practices will be shared.

**Interactive Science Notebooks for Your High School Science Course***(Grades 9–12)**Plaza 1, JW Marriott*

Science Focus: GEN, CCC

**Tamara Slowiak** ([@tslowiak](mailto:@tslowiak); [@ChiHiScience](mailto:@ChiHiScience); [slowiatj@chipfalls.org](mailto:slowiatj@chipfalls.org)) and **Kari Skaar** ([@WIChemGirl](mailto:@WIChemGirl); [@ChiHiScience](mailto:@ChiHiScience); [skaarke@chipfalls.org](mailto:skaarke@chipfalls.org)), Chippewa Falls High School, Chippewa Falls, Wis.

Implement interactive science notebooks in your high school science class. A great tool for organizing notes, formative assessments, and enhancing student involvement.

**Flipping the Classroom: The Things They Don't Tell You***(Grades 9–12)**Plaza 2, JW Marriott*

Science Focus: GEN, NGSS

**Krystal Romanowski** and **Lauren Scott**, Chesapeake High School, Baltimore, Md.

Find out how to sort through all of the tips, tricks, and shortcuts you get in order to make flipping your classroom a more meaningful learning experience for you and your students.

**Discover the NGSS: An Interactive Exploration of the Next Generation Science Standards***(General)**507, Convention Center*

Science Focus: GEN, NGSS

**Leisa Clark**, Assistant Executive Director, e-Products, NSTA, Arlington, Va.

Come learn how to put the pieces of the NGSS together with NSTA's first-ever interactive e-book on the standards—*Discover the NGSS: Primer and Unit Planner*. The first 20 attendees receive free copies of this Enhanced E-book.

**The Science Collective: Project-Based Learning as a Multi-Science Teacher***(Grades 9–12)**515B, Convention Center*

Science Focus: GEN

**Jillian Estrella** ([jestrel2@houstonisd.org](mailto:jestrel2@houstonisd.org)), **Amanda Alexander** ([acamp@houstonisd.org](mailto:acamp@houstonisd.org)), **Julie Lockhart** ([jlockhal@houstonisd.org](mailto:jlockhal@houstonisd.org)), **Lauren Baird** ([lbaird@houstonisd.org](mailto:lbaird@houstonisd.org)), and **Jody Gibson** ([@DrG\\_Energy](mailto:@DrG_Energy); [jgibson6@houstonisd.org](mailto:jgibson6@houstonisd.org)), Energy Institute High School, Houston, Tex.

Deciding on a session? Don't pass on this one! We're covering PBL, real-world issues, scaffolding, and differentiation in mixed classrooms with insight for each science simultaneously.

**Early Childhood Science Experiences: Laying the Foundation for More Complex Science Practices in the Future**

(Grades P–5) *Kentia Hall A, Convention Center*

Science Focus: GEN, SEP1, SEP3, SEP6

**Anne Durrance** (*anne.durrance@gmail.com*), South Dale Middle School, Pinckard, Ala.

**Beth Van Meeteren** (*beth.vanmeeteren@uni.edu*), University of Northern Iowa, Cedar Falls

**Jennifer Thompson** (*@jenjuneau; jenjuneauak@gmail.com*), NSTA Director, Preschool/Elementary Science Teaching, and Harborview Elementary School, Juneau, Alaska

**Patricia Paulson** (*@Pattipaulson1; patricia-paulson@bethel.edu*), Bethel University, Saint Paul, Minn.

**Rebecca Kurson** (*@beckyk326; rkurson@goldaochacademy.org*), Golda Och Academy, West Orange, N.J.

**Stephanie Selznick** (*sselznick71@gmail.com*), Endeavor Elementary School, Orlando, Fla.

**Timothy Dalby** (*@tddalby; tdalby@wilmingtonfriends.org*), Wilmington Friends School, Wilmington, Del.

Discussion centers on how young children explore materials and the environment to build conceptual understanding. With engaging materials, time and adult guidance nurture a developmentally appropriate learning environment for young children. This collaborative session highlights early childhood science learning over time.

**Using Fictional Picture Books to Do Science: How Is It Possible?**

(Grades K–3) *Kentia Hall B, Convention Center*

Science Focus: LS

**Catherine Bruguere** (*catherine.bruguere@univ-lyon1.fr*), University of Lyon, France

**Sue Dale Tunnicliffe** (*lady.tunnicliffe@mac.com*), Reader in Science Education, Bracknell, U.K.

Join us as we explore which and how fictional picture books can allow young children to ask questions and define problems about animal metamorphosis.

**Helping ALL K–6 Students Understand the Impact of STEM and the Essential Integration of All STEM Disciplines: Explorations with Physical Structures and Everyday Household Objects**

(Grades K–6) *Kentia Hall E, Convention Center*

Science Focus: GEN, SEP

**Donna Knoell** (*dknoell@sbcglobal.net*), Educational Consultant, Overland Park, Kans.

This presentation will model integration of STEM disciplines in classroom explorations, by analyzing and constructing physical structures and everyday household objects, advancing learning and igniting engagement and creativity. Handouts!

**From Decomposers to Composers—Teaching Writing in Science**

(Grades K–8) *Kentia Hall L, Convention Center*

Science Focus: GEN, CCC

**Holly Rosa** (*@BPSScienceHolly; hrosa@bostonpublicschools.org*), Boston (Mass.) Public Schools

**Tracy Hodgson-Drysdale** (*tdrysdal@lesley.edu*), Lesley University, Cambridge, Mass.

Do you hear exciting science talk in your classroom and wonder how students can transform it into writing? Learn how to take science writing from observation to explanation.

**Igniting Student Interest and Imagination with Harry Potter Episodes**

(Grades 2–8, College) *Theatre (411), Convention Center*

Science Focus: GEN, INF

**Alan McCormack** (*amccorma@mail.sdsu.edu*), 2010–2011 NSTA President, and Professor Emeritus, San Diego State University, San Diego, Calif.

Magical and scientific events highlight adventures of Harry Potter in the worldwide children’s literature series. Moaning Myrtle, Fawkes the Phoenix, and Hedwig the Owl will be guests! Wands optional.

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**8:00–9:00 AM Hands-On Workshops**

**Promoting Curiosity Through Outdoor Inquiry**

(Grades 4–12) *Diamond Ballroom Salon 2, JW Marriott*

Science Focus: LS4.C, SEP1, SEP3, SEP4, SEP7

**Meg Jakubowski** (*@MegJako; @NatureBridge; mjakubowski@naturebridge.org*), Naturebridge Southern California, Newbury Park

Promoting curiosity is a critical foundation to endearing students to science and promoting science literacy. Using tools, I’ll model a practices-supporting mini-inquiry project.



**NSTA Press® Session: Planning Three-Dimensional Formative Assessments with the Feedback Loop**

(Grades 6–12) *Diamond Ballroom Salon 3, JW Marriott*

Science Focus: GEN, NGSS

**Erin Furtak** (*@furtak; erin.furtak@colorado.edu*), University of Colorado Boulder

Come collaborate with other science teachers as you learn to use the Feedback Loop Planning Process to plan and reflect on 3-D formative assessments.

### Cracking the Case: Integrating Biology and Engineering in Case Studies

(Grades 6–12) *Diamond Ballroom Salon 6, JW Marriott*  
Science Focus: ETS, LS, SEP6

**Rebecca Hite** (@sciencebecca; *rebecca.hite@ttu.edu*), Texas Tech University, Lubbock

**M. Gail Jones, Megan Ennes** (@AFishNamedMeg; *meennes@ncsu.edu*), **Katherine Chesnutt** (*kmchesnutt@gmail.com*), **Emily Cayton** (@caytonscience; *emcayton@ncsu.edu*), and North Carolina State University, Raleigh

**Gina Childers**, University of North Georgia, Dahlonega  
Looking for ways to contextualize biology concepts using the “E” in STEM? Join us to explore hands-on case studies to use in grades 6–12 life science.

### CRASH Science! Investigating the Dangers of Distracted Driving

(Grades 6–12) *Diamond Ballroom Salon 7, JW Marriott*  
Science Focus: LS, PS, SEP

**Griff Jones** (*gjones@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.

### Supporting Leadership Development in Science Educators

(Grades 8–12) *Diamond Ballroom Salon 8, JW Marriott*  
Science Focus: GEN, NGSS

**Elizabeth Chatham** (@EChathamNVPS; *libbychat@gmail.com*), New Visions for Public Schools, New York, N.Y.

**Christopher King** (*cking@westbronxacademy.org*), West Bronx Academy, Bronx, N.Y.

Join us for an interactive session exploring how to use collaborative curriculum design as a vehicle for leadership development in science educators.

### Expanding Our Capacity for Observation: Prototyping Tools for Scientific Investigation with Arduino Electronics Boards

(Grades 6–12) *Diamond Ballroom Salon 9, JW Marriott*  
Science Focus: ETS, PS, SEP3, SEP4, SEP5

**Justin Sheehan** (@GamerTeach; *jmsheehan3@gmail.com*), Illinois Institute of Technology, Chicago

Use Arduino electronics prototyping boards and an array of sensors to answer investigation questions about your immediate environment.

### ASTC-Sponsored Session: Integrating Real-World Science, NGSS Three Dimensions of Learning, and Technology to Promote Critical Thinking, Collaboration, and Communication

(Grades 6–8) *Olympic 3, JW Marriott*  
Science Focus: LS4, CCC1, CCC2, CCC6, SEP

**Madlyn Runburg** (@mrunburg; *mrunburg@nhmu.utah.edu*) and **McKenna Lane** (*mlane@nhmu.utah.edu*), Natural History Museum of Utah, Salt Lake City

**Kirsten Butcher** (@profbutcher; *kirsten.butcher@utah.edu*), The University of Utah, Salt Lake City

Transform classroom learning using virtual investigations that leverage 3-D models of museum artifacts to engage students in authentic scientific research supported by real scientists.

### Building STEM Through Exploring Our Climate System

(Grades 7–College) *Platinum Ballroom Salon B, JW Marriott*  
Science Focus: ESS, CCC, SEP

**Margie Turrin** (*mkt@ldeo.columbia.edu*), Lamont-Doherty Earth Observatory, Palisades, N.Y.

What better way to engage our students in STEM than to use technology and allow them to interact directly with the data layers in visualizations.

### Leveraging Digital Design and Fabrication Tools in Your Classroom

(General) *Platinum Ballroom Salon C, JW Marriott*  
Science Focus: ETS, CCC, SEP

**Caroline McEnnis** (*carolinemcennis@tiesteach.org*), Teaching Institute for Excellence in STEM (TIES), Cleveland, Ohio  
Find out how to leverage digital design and fabrication tools to support the integrated teaching, learning, and assessment of the three dimensions of the NGSS by engaging in a digital fabrication-based science activity that meets the NGSS performance expectations.

### STEER: STEM Training for Engineering Educators Using Robotics

(Grades 1–12) *Platinum Ballroom Salon D, JW Marriott*  
Science Focus: ETS, CCC2, SEP1, SEP2, SEP3

**Ginger Reasonover** (*ginger.reasonover@lipscomb.edu*) and **Wendy Rampy** (*wendy.rampy@lipscomb.edu*), Lipscomb Academy, Nashville, Tenn.

Engage in NGSS ideas through hands-on activities and lecture to develop performance expectations using age- and skills-appropriate STEM and robotics learning activities.

### Under the California Sun—Where Photosynthesis Happens!

(Grades 6–12) *Platinum Ballroom Salon F, JW Marriott*  
Science Focus: LS2.B, CCC, SEP

**Mindy Pearson**, 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.

### Using a 3D Triple Bottom Line Approach to Explore Global Biodiversity Using Web-Based Maps

(Grades 7–College) *Platinum Ballroom Salon G, JW Marriott*  
Science Focus: LS2, LS4.D, CCC2, CCC4, CCC7, SEP1, SEP2, SEP4, SEP7

**Michelle Watkins** ([michellewatkins@frontiernet.net](mailto:michellewatkins@frontiernet.net)), Beaver River Central School, Beaver Falls, N.Y.

**James MaKinster** ([makinster@hws.edu](mailto:makinster@hws.edu)), Hobart and William Smith College, Geneva, N.Y.

**Nancy Trautmann** ([nancy.trautmann@cornell.edu](mailto:nancy.trautmann@cornell.edu)), The Cornell Lab of Ornithology, Ithaca, N.Y.

Challenge students to explore global biodiversity issues by evaluating human impacts on people, profits, and the planet using web-based GIS maps and simulations.



### Got Science? Get Literacy!

(Grades K–8) *502A, Convention Center*  
Science Focus: PS1.A, SEP

**Barbara Reinert**, (Scottsdale, Ariz.) Unified School District  
See how amping up your science instructional design can increase literacy with your students by using science discourse, shared writing experiences, and interactive notebooks.



### Support English Language Learners in STEM Education Through Engagement in Engineering Challenges

(Grades 1–5) *502B, Convention Center*  
Science Focus: ETS, SEP

**Kathryn (Katy) Hutchinson** ([@eie\\_org](mailto:@eie_org)) and **Nia Keith**, Museum of Science, Boston, Mass.

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

### NGSS Creating Inquiry Lessons Using NGSS

(Grades K–12) *515A, Convention Center*  
Science Focus: GEN, CCC, SEP

**Jennifer Chronowski** ([jchronowski@gmail.com](mailto:jchronowski@gmail.com)), Options Secondary School, Chula Vista, Calif.

Find out how to use the NGSS practices and 5E model (Engage, Explore, Explain, Elaborate, and Evaluate) to create your own inquiry lessons.

### Science in the Early Childhood Classroom

(Grades P–2) *Kentia Hall C, Convention Center*  
Science Focus: GEN, NGSS

**Katie Morrison** ([@UCDS\\_Seattle](mailto:@UCDS_Seattle); [katiem@ucds.org](mailto:katiem@ucds.org)) and **Deb Chickadel** ([@UCDS\\_Seattle](mailto:@UCDS_Seattle); [debc@ucds.org](mailto:debc@ucds.org)), University Child Development School, Seattle, Wash.

Investigate how to foster scientific understanding and practice skills in our youngest learners. Take away topics of inquiry and tools for planning experiments and documenting student thinking.

### Sewable and Paper Circuits

(Grades 3–6) *Kentia Hall D, Convention Center*  
Science Focus: PS3

**Wendy Smith** ([@wssmith](mailto:@wssmith); [wendysmith1005@gmail.com](mailto:wendysmith1005@gmail.com)), Hong Kong International School, Tai Tam

Discover how to make your own creative electrical circuit using felt, conductive thread, LEDs, coin batteries, paper, and copper tape. Learn how these materials were used as part of a grade 4 energy unit.

### Common Scientific Misconceptions: An Accurate, Exciting, and Interactive Approach to Teaching Fundamental Concepts in the Primary Grades

(Grades P–3) *Kentia Hall F, Convention Center*  
Science Focus: GEN, NGSS

**Jeffrey Dudukovich**, Liberty Middle School, Orlando, Fla.

Get ready to try an original hands-on approach to teaching fundamental scientific concepts in a way that students will remember forever! Prizes awarded!



**Nature’s Superheroes: Integrating Science and Literacy Through Comics**

(Grades 3–6) *Kentia Hall H, Convention Center*  
 Science Focus: LS2, SEP8

**Jacqueline Horgan** (*jhorgan@amnh.org*), **Safiya Sabir** (*ssabir@amnh.org*), and **Mark Popinchalk** (*@Mark-Popinchalk*), American Museum of Natural History, New York, N.Y.

The American Museum of Natural History will share “Nature’s Superheroes,” an integrated science and literacy course for upper elementary.

**Developing Innovators and Entrepreneurs Through STEM-Focused Reading!**

(Grades K–8) *Kentia Hall J, Convention Center*  
 Science Focus: ETS1

**Susanne Hokkanen** (*susanne.hokkanen@gmail.com*), Heritage Middle School, Summit Argo, Ill.

We will use a STEM focus in reading to engage students in critical thinking and authentic problem solving with the engineering design cycle and children’s literature.

**Using Phenomena to Support Literacy Demands of the NGSS**

(Grades 5–12) *Kentia Hall K, Convention Center*  
 Science Focus: GEN, SEP

**Dawn O’Connor** (*@dawn\_oconnor*; *dawn@acoe.org*), Alameda County Office of Education, Hayward, Calif.

Want to experience how learning anchored in sense making increases students’ scientific literacy? Through exploration of phenomena and scaffolds, make science accessible for all students.



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 About How Our Food Is Grown

**Join us. Ask tough questions. Be skeptical. Be open.  
 We look forward to sharing answers.**

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**Beat Masters: Analyzing the Energy of Sound Waves and Audio Engineering**

(Grades 4–8) *Kentia Hall M, Convention Center*  
Science Focus: ETS2, PS2, PS4.A, PS4.C, CCC1, CCC5, SEP

**Aubrey Crook** (*aubrecrook@hotmail.com*), Georgia Youth Science and Technology Centers, Kennesaw

Bring your laptop and headphones to learn this S.T.E.A.M approach for analyzing sound energy as it relates to audio engineering in the radio, television, and film industries.

**Studying Earth’s Climate from Above**

(Grades 6–12) *Kentia Hall P, Convention Center*  
Science Focus: ESS2.C, ESS2.D, ESS3.D, LS1.C, LS2.B, LS2.C

**Julie Bookman** (*@jbookman76; jbookman@avhsd.org*), Palmdale High School, Palmdale, Calif.

Satellites and NASA aircraft such as *Global Hawk* provide data and images students can use to understand and write about Earth systems and climate change.

**Science and Literacy: Ecosystems with Harry Potter**

(Grades 5–8) *Kentia Hall Q, Convention Center*  
Science Focus: LS2.A, CCC2, CCC4, CCC6, SEP1, SEP2

**Kelly Shepard**, Illinois Institute of Technology, Chicago  
Use the Harry Potter novels to integrate *CCSS ELA* concepts with the interdependent relationships in ecosystems as presented in the *NGSS*. Wands optional.

**Learning About Ecosystem Management Through NGSS: Developing Solutions to Invasive Species Using Science and Engineering Practices**

(Grades 6–8) *Kentia Hall R, Convention Center*  
Science Focus: ETS1.B, LS2.A, LS2.C, LS2.D, CCC1, CCC2, CCC7, SEP4, SEP6, SEP7

**Tony Matthys** (*@MTU\_MiSTAR; admatthy@mtu.edu*), **Stephanie Tubman** (*@MTU\_MiSTAR; sctubman@mtu.edu*), and **Brenda Bergman**, Michigan Technological University, Houghton

**Dawn Kahler** (*kahlerdm@kalamazoo.k12.mi.us*), Milwood Magnet School, Kalamazoo, Mich.

**Robin Allen** (*allenrj@midlandps.org*), Northeast Middle School, Midland, Mich.

Experience classroom-tested activities from an *NGSS*-focused unit, and learn strategies that have been designed to make ecological learning engaging and fun for students.

**Hands-On Simulations of Bacterial Cell Transformation**

(Grades 9–College) *Kentia Hall S, Convention Center*  
Science Focus: LS, CCC

**Danielle Alcena** (*danielle\_alcena@urmc.rochester.edu*) and **Dina Markowitz** (*dina\_markowitz@urmc.rochester.edu*), University of Rochester, N.Y.

Traditional methods of teaching high school– and college-level bacterial cell transformation require multiple class/lab sessions and live cells. Perform all of the steps in traditional bacterial transformation, but in a fraction of the time using a new simulation protocol. Free online resources from the University of Rochester’s Life Sciences Learning Center (LSLC) will be shared.

**NESTA and NSTA Aerospace Education Advisory Board Space Science Share-a-Thon**

(Grades K–12) *Petree Hall D, Convention Center*  
Science Focus: ESS

**Carla McAuliffe** (*carla\_mcauliffe@terc.edu*), TERC, Cambridge, Mass.

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

**Exploring STEM Across the Curriculum**

(Grades P–3) *West Hall B-2, Convention Center*  
Science Focus: ETS1

**Anna Gaiter**, Plainview Academic Charter Academy, Tujunga, Calif.

Engage in hands-on activities that can increase your knowledge of STEM by using children’s literature to integrate STEM concepts across the curriculum.

**The Role of Students’ Gestures in Constructing Explanations**

(Grades 6–8) *West Hall B-3, Convention Center*  
Science Focus: ESS1.B, PS1.A, PS3.B, CCC2, CCC4, SEP2, SEP6

**Robert Wallon** (*@rwallon; rwallon2@gmail.com*), The University of Illinois at Urbana-Champaign

See how paying attention to gestures can provide opportunities to assess student thinking and how prompting students to gesture can help develop explanations of phenomena.

**Making Sense of the Sun**

(Grades 9–12) *West Hall B-5, Convention Center*  
Science Focus: ESS1.A, CCC1, SEP2, SEP4

**Rich Hedman**, California State University, Sacramento  
How does the Sun produce heat and light? Examine solar phenomena, identify patterns in the data, and develop and revise a conceptual model.

**RESCHEDULED TO  
FRIDAY, 12:30 PM  
(see program changes)**

**8:00–9:30 AM Exhibitor Workshops****Engineering Design in the NGSS***(Grades 5–8)**153A, Convention Center*

Science Focus: ETS1

Sponsor: TCI

**Nathan Wellborne**, TCI, Mountain View, Calif.

Participants will be immersed in a Bring Science Alive! investigation designed to reach all learners and make engineering design fun and engaging. Experience this lesson from the student perspective as you take on the role of an engineer defining problems, developing solutions, and testing to best solve the problem.

**Bird Flu, Swine Flu, Pandemic Flu, Oh My!***(Grades 9–12)**153B, Convention Center*

Science Focus: LS1.A, LS1.B, LS4, CCC2, CCC6, SEP1, SEP2

Sponsor: MSOE Center for BioMolecular Modeling

**Margaret Franzen** ([franzen@msoe.edu](mailto:franzen@msoe.edu)), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

How do viruses enter cells and evade the body's defenses? How do we prepare—and are we ready—for the next influenza pandemic? Explore the influenza virus—including the infection mechanism, genetic shift and drift, mixing vessels, and pandemic strains—with innovative physical models and visualization tools.

**Outdoor Education in Southern California***(Grades 4–12)**301 AB, Convention Center*

Science Focus: GEN

Sponsor: Pali Institute

**Annie Jackson** and **Mark Stein**, Pali Institute, Running Springs, Calif.

We will explore the philosophy, programming, and benefits of outdoor education in Southern California through observations made at Pali Institute. Experiential education has a lasting impact on students of all ages, different learning styles, and diverse backgrounds. Come let us show you how we bring textbooks to life!

**The Secret Lives of Fish: Migration, Movement, and More***(Grades 5, 6–8)**303 AB, Convention Center*

Science Focus: LS

Sponsor: U.S. Fish and Wildlife Service

**Catherine Gatenby** and **Denise Wagner**, U.S. Fish and Wildlife Service, Elkins, W.Va.

Fish have a lot going on in their underwater world, but out of sight often means out of mind. Using new FWS lessons, join us to engage in a hands-on activity, oriented toward

the NGSS, to learn the secrets of fish migration, challenges and barriers to migration, and how we can help conserve our fisheries.

**Bring Robotics to Your Science Classroom with LEGO® MINDSTORMS® Education EV3***(Grades 5–12)**304C, Convention Center*

Science Focus: ETS

Sponsor: LEGO Education

**Kelly Reddin**, LEGO Education, Billund, Jylland, Denmark

Want to prepare your students for STEM-related fields? Want to bring more engineering and Problem-Based Learning into the classroom? Come to this workshop to not only program a LEGO MINDSTORMS Education EV3 robot, but also leave with the confidence to bring robotics to your classroom for more student-centered learning.

**Biology with Vernier***(Grades 7–College)**402A, Convention Center*

Science Focus: ETS2, LS1, LS2

Sponsor: Vernier Software &amp; Technology

**Colleen McDaniel** ([info@vernier.com](mailto:info@vernier.com)), Vernier Software & Technology, Beaverton, Ore.

Use Vernier sensors to conduct biology experiments from our lab books in this engaging hands-on workshop. Collect and analyze data on LabQuest 2 and computers. Data sharing with mobile devices will be demonstrated. Explore our wide range of digital tools that promote student understanding of biology concepts.

**Wind and Solar Energy Basics with Vernier***(Grades 3–8)**402B, Convention Center*

Science Focus: ESS3, ETS2, PS3

Sponsor: Vernier Software &amp; Technology

**Frances Poodry** ([info@vernier.com](mailto:info@vernier.com)), Vernier Software & Technology, Beaverton, Ore.

Explore renewable energy using KidWind solar and wind experiment kits with Vernier data-collection technology as you design, test, and refine a device that converts energy from one form to another. This hands-on workshop is based on activities from our *Investigating Wind Energy* and *Investigating Solar Energy* lab books.

**Science Bits: The 17-Time Digital Curriculum Award-Winner That Enhances Learning with Understanding**

(Grades 6–8) 403B, Convention Center

Science Focus: GEN, NGSS

Sponsor: Learning Bits

**Hector Martin** ([hruiz@science-bits.com](mailto:hruiz@science-bits.com)), Learning Bits, Miami, Fla.

Science Bits is a multimedia curriculum that promotes the change from a transmission educational model—based on the transmission of facts from teacher to learner—to a constructivist one—based on inquiry, critical thinking, discovery, and learning-by-doing. To do so, Science Bits empowers teachers with lessons that adhere to the 5E instructional model (Engage, Explore, Explain, Elaborate, and Evaluate).

**Contagion! Track the Spread of Dangerous Disease**

(Grades 9–College) 404 AB, Convention Center

Science Focus: LS

Sponsor: Bio-Rad Laboratories

**Damon Tighe** ([damon\\_tighe@bio-rad.com](mailto:damon_tighe@bio-rad.com)), Bio-Rad Laboratories, Hercules, Calif.

Disease can spread like wildfire through populations. In this hands-on lab workshop, you will assume the role of an epidemiologist and use an ELISA assay to track viruses like HIV, Ebola, Zika, and SARS. See if you can find patient zero.

**Using the Classic Demonstration to Engage Students in Science Talk**

(Grades 6–College) 406 AB, Convention Center

Science Focus: PS

Sponsor: South Dakota State University Dept. of Chemistry

**Matthew Miller**, South Dakota State University, Brookings  
The Department of Chemistry and Biochemistry at South Dakota State University offers an online MS in chemistry for teachers. We will show and discuss a variety of safe demonstrations to engage students in the classroom. These discussions will demonstrate similar activities that occur in the MS program.

**How Do Diseases Circumvent the Immune System? Engaging High School Students**

(Grades 9–College) 408A, Convention Center

Science Focus: LS, CCC, SEP

Sponsor: Vaccine Education Center

**Donald Mitchell** ([donald@medicalhistorypictures.com](mailto:donald@medicalhistorypictures.com)), Eye-line Pictures, LLC, Flourtown, Pa.

**Charlotte Moser** ([moser@email.chop.edu](mailto:moser@email.chop.edu)), Vaccine Education Center at Children’s Hospital of Philadelphia, Pa.

Understanding the immune system and how diseases develop

will help students long after they have left your classroom. We will introduce new free modules that can help students understand these concepts and more, including the science behind vaccines. Modules include engaging animations, readings, and assignments. Come find out more!

**Engineering for the NGSS Upper Elementary Science Classroom**

(Grades 3–5) 408B, Convention Center

Science Focus: ESS3.A, ETS1, PS3, SEP1, SEP2

Sponsor: Houghton Mifflin Harcourt

**Michael DiSpezio** ([icaris@aol.com](mailto:icaris@aol.com)), HMH Author, Broadcast Host, and Global Educator, North Falmouth, Mass.

Construct your own working model of a wind turbine as you learn best practices for addressing the engineering standards in the grades 3–5 NGSS classroom. Explore how the disciplinary core ideas for physical science, Earth science, and engineering design are seamlessly integrated into an engaging, inexpensive, and student-driven classroom project.

**Become a Nat Geo–Certified Educator**

(Grades P–12) 409 AB, Convention Center

Science Focus: GEN

Sponsor: National Geographic

**Alison Szopinski** and **Meghan Modafferi**, National Geographic Education, Washington, D.C.

National Geographic invites you to participate in its new certification program. Share ideas on how to teach science with a global perspective and learn about National Geographic’s Learning Framework, teaching students about the world and how it works, empowering them to succeed and make it a better place. This session counts as phase 1 of certification. There is no cost to get certified, and the program can be completed at your own pace.

**BUGDORK! Using Insects to Engage Students and Inspire Learning**

(Grades K–5) 410, Convention Center

Science Focus: LS1.A, LS1.B, CCC1, CCC6, SEP1, SEP3, SEP8

Sponsor: Celestron

**Kristie Reddick**, The Bug Chicks, College Station, Tex.

Learn ways you can use arthropods in the classroom! Entomologist and educator Kristie Reddick of The Bug Chicks will help you conquer your fears and gain knowledge about animals that inspire inquiry in your students. Workshop includes digital microscope training, lessons to use immediately, integration of scientific concepts, and a chance to win digital microscopes!

### Teach Biodiversity By Building Interactive Virtual Bio Domes!

(Grades 4–7)

503, Convention Center

Science Focus: LS2.A, LS2.C

Sponsor: Springbay Studio Ltd.

**Jane Ji**, Springbay Studio Ltd., Toronto, Ont., Canada

Come explore the wetland and oceanic habitats, along with all the amazing species that live within. Build marshes, coral reefs, and many more habitats from scratch. Help plants and animals flourish by learning and applying the laws of nature. Engage your students in biology through engaging play and problem solving. Try “iBiome-Wetland” (awarded Best Learning STEM App) and “iBiome-Ocean” (a newly released sequel), and experience an innovative way to learn about biodiversity in the water world.

### Zombie Apocalypse!

(Grades 6–12)

511 AB, Convention Center

Science Focus: GEN

Sponsor: Texas Instruments

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

Be part of a zombie apocalypse! Learn about disease spread modeling using simulations and fun story lines about a zombie outbreak. Applicable for middle school and high school, this workshop is sure to scare you and your little zombies with its exciting Hollywood themes used to engage students in learning science!

### 8:00–10:00 AM Meeting

#### Teaming Up for STEM: Team Discussion and Planning Meeting

(By Invitation Only) Diamond Ballroom Salon 4, JW Marriott

### 8:00–10:00 AM Hands-On Workshop

#### CESI-Sponsored Session: Using Toys to Teach Physics Share-a-Thon

(Grades P–8)

152, Convention Center

Science Focus: PS3

**Karen Ostlund** (@karen\_ostlund; klostlund@utexas.edu), 2012–2013 NSTA President, and The University of Texas at Austin

**Betty Crocker** (betty.crocker@unt.edu), Retired Educator, Denton, Tex.

**Jim McDonald** (@jimscienceguy; jim.mcdonald@cmich.edu), Central Michigan University, Mount Pleasant

Join us to gather ideas for how toys can be used to teach physics concepts in order to promote student motivation, excitement, interest, and learning.

### 8:00–11:00 AM Short Courses

#### NGSS Meets the Outdoors: Teaching Elementary Science Outside (SC-14)

(Grades 1–5) Tickets Required; \$13 Grand Hope Park, Off-site  
Science Focus: GEN, NGSS

**Kara Haas** (@KaraHaaSciEd; karahaas@msu.edu), Michigan State University, Hickory Corners

**Tali Tal** (rtal@technion.ac.il), Technion-Israel Institute of Technology, Haifa

**Renee Bayer** (rbayer@msu.edu), CREATE for STEM Institute, Michigan State University, East Lansing  
For description, see Volume 1, page 60.

Note: Meet your short course trip leader for the walk at the Pico Drive entrance of the Convention Center. Please arrive by 7:45 AM.



#### Fostering a Science-Driven Language and Literacy Learning Environment (SC-11)

(Grades 3–8) Tickets Required; \$31 San Gabriel A, Westin  
Science Focus: PS1.A, PS3.A, CCC2, CCC5, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

**Diana Velez** (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 59.

#### Hands-On/Minds-On STEM: An Integrated Engineering Design Challenge (SC-12)

(Grades P–8) Tickets Required; \$55 Santa Anita A, Westin  
Science Focus: ETS, SEP

**Kristin Thomsen** (kthomsen@ocde.us), **Christie Pearce** (cpearce@ocde.us), and **Leslie Corbett** (lcorbett@ocde.us), Orange County Dept. of Education, Costa Mesa, Calif.

For description, see Volume 1, page 60.

#### Elementary Curriculum Development for the NGSS: How to Integrate the Three Dimensions of Learning into an Elementary Classroom (SC-13)

(Grades K–5) Tickets Required; \$5 Santa Anita B, Westin  
Science Focus: GEN, NGSS

**David Jacob** (djacob@pnwboces.org), Putnam/Northern Westchester BOCES, Yorktown Hgts, N.Y.

For description, see Volume 1, page 60.

### 8:15–9:15 AM Meeting

#### Past Presidents Advisory Board Meeting

Gold Ballroom Salon 4, JW Marriott

### 8:30–9:00 AM Presentations

#### Integrating Engineering into Life Science Lessons

(Grades K–8) 505, Convention Center

Science Focus: LS, CCC, SEP

**Michelle Forsythe**, Texas State University, San Marcos  
Engineering is more than rockets and robots. Come explore how to meaningfully infuse engineering into your K–8 life science lessons.

#### Schoolwide STEM Implementation

(Grades 3–8) 506, Convention Center

Science Focus: GEN, CCC

**Robert Clifton**, Rose Park Magnet Math and Science Middle School, Nashville, Tenn.

Get excited about all subject areas in STEM. Alleviate your fear of not knowing about STEM, knowing how to start a PBL, or knowing how to bridge the gap between ELA and science. Engage in several hands-on activities and discuss how STEM can be incorporated in ELA, math, and science classes.

#### Shifting Practice in a Title I Urban Elementary School to Empower Teachers to Increase Science Learning Opportunities

(Grades K–6) Kentia Hall G, Convention Center

Science Focus: ESS2.A, ESS2.B, CCC1, CCC2, SEP2, SEP6

**Wendi Laurence** (@Createosity; wendi@create-osity.com) and **Candace Penrod** (candace.penrod@sicschools.org), Salt Lake City (Utah) School District

Teachers, specialists, and coaches tell the story of implementing a place-based three-dimensional science program in a Title I urban elementary school with over 20 languages represented.

#### Robotics: A Pathway to Get Ready for the Real World

(Grades 6–12) Kentia Hall N, Convention Center

Science Focus: ETS1, INF, SEP

**Bert Te Velde** (bvelde@susd.org), Mohave Middle School, Scottsdale, Ariz.

Robotics is more than building and programming. Students problem solve, collaborate, and communicate. With guidance, competitive teams act like startups in the real world.

#### The Use of a Role-Playing Game in the Teaching of Chemistry

(Grades 10–11) Kentia Hall O, Convention Center

Science Focus: PS, CCC, SEP

**Paul Orbe** (porbe@union-city.k12.nj.us), Academy for Enrichment and Advancement, Union City, N.J.

Come learn how to measure student engagement and academic performance through a role-playing activity. Join me for an overview of the activity and some interesting results.

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### 8:30–10:30 AM Meeting

#### Shell Panel Meeting

(By Invitation Only) Georgia 1, JW Marriott

### 9:00–10:00 AM Meeting

#### Elementary Science Teaching Methods Meeting—ASTE

Olympic 2, JW Marriott

For details, please visit [farwestaste.wordpress.com](http://farwestaste.wordpress.com).

### 9:00 AM–3:00 PM Exhibits

Hall H, Convention 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

Atrium 1, JW Marriott

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**

**A Crash Course in Crash Research: An Insider’s Look at the IIHS’s Vehicle Research Center**

(Grades 3–12) *Platinum Ballroom Salon H, JW Marriott*  
 Science Focus: ETS2.B

**Griff Jones** (*gjones@coe.ufl.edu*), University of Florida, Gainesville

**Pini Kalnite**, Insurance Institute for Highway Safety, Arlington, Va.

Go behind the scenes of the award-winning IIHS educational videos *Understanding Car Crashes* and the Vehicle Research Center to promote crash-science concepts and STEM career awareness.

**Equity Through Instruction: Differentiation Labs**

(Grades 4–8) *506, Convention Center*

Science Focus: GEN, SEP1, SEP3, SEP4

**Latonya Waller** (*lwaller2@rvaschools.net*), Boushall Middle School, Richmond, Va.

**Helena Easter** (*@helena260; heaster@richmond.k12.va.us*), Richmond (Va.) Public Schools

Standards are the same, but engaging labs and experiments don’t have to be to meet the learning goals of all students.

**Fostering Science Literacy Through Discussion**

(Grades 6–8) *514, Convention Center*

Science Focus: GEN, NGSS

**Kailin Cornwall** (*kcornwall@uchicagocharter.org*), UChicago Charter School, Woodlawn Campus, Chicago, Ill.

Push students into critical dialogue and argumentation. Learn about promoting literacy in the science classroom through student-led discussion about current science issues.

**“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 1**

**9:30–10:30 AM**

Los Angeles Convention Center, 507

For more information on the Retired Members Advisory Board, contact Lloyd Barrow, Chair, at *barrowl@missouri.edu*.





### 9:30–10:30 AM Featured Presentation

#### Climate Change: Why K–12 Education Is a Seminal Part of the Solution

(Grades K–12)

Theatre (411), Convention Center

Science Focus: ESS3.D



**Veerabhadran Ramanathan** ([vramanathan@ucsd.edu](mailto:vramanathan@ucsd.edu)), Distinguished Professor of Climate Sciences, Scripps Institution of Oceanography, University of California San Diego, La Jolla

President: Cheryl Peach, Scripps Institution of Oceanography, University of California San Diego, La Jolla

Climate change is already happening and likely to get a lot worse sooner than the time scale assumed by the public and policy makers. With unchecked pollution emissions, negative impacts on the health of people and that of the planet could be immense for generations to come. Fortunately, there is still time to act and protect ourselves from the threats of climate change. K–12 education followed by college level education on climate change solutions could unleash a million climate warriors needed to tackle this defining problem.

*Veerabhadran Ramanathan is a distinguished professor of Climate Sciences at Scripps Institution of Oceanography. In addition, he serves on the council of the Pontifical Academy of Sciences that reports to Pope Francis. He also chairs a major initiative of the 10-campus University of California system effort called Bend the Curve towards Carbon Neutrality and Climate Stability and serves as an advisor to Governor Jerry Brown of California on climate change. Focused on issues related climate justice, Professor Ramanathan founded, designed, and leads Project Surya—an extended effort to characterize and mitigate environmental impacts of cooking with solid biomass as a way to protect the bottom three billion from climate change. By teaming up with the Pontifical Academy of Sciences, he is forming an alliance between science, policy, and religion to seek solutions to the climate change problem in an apolitical forum.*

*Professor Ramanathan has been conducting original research in climate and atmospheric science since the 1970s. Based on his research, he developed a new approach for allaying climate change that involves mitigating emissions of four short-lived climate pollutants (SLCPs) to drastically reduce near-term warming and slow down the retreat of the Himalayan glaciers. He is now implementing this new approach in the field. He has been elected to the U.S. National Academy and the Royal Swedish Academy. In 2013, the United Nations named him a Champion of the Earth.*



**9:30–10:30 AM Presentations****NSELA-Sponsored Session: Got Science? Get Literacy!***(Grades P–12)* Atrium 3, JW Marriott

Science Focus: PS1.A, SEP

**Barbara Reinert** (*breinert@susd.org*), Scottsdale (Ariz.) Unified School District

See how amping up your science instructional design can increase literacy with your students by using science discourse, shared writing experiences, and interactive notebooks.

**How Can a STEM Teacher Become a Relevant and Sought-After Voice in Policy?***(General)* Diamond Ballroom Salon 6, JW Marriott

Science Focus: ETS, INF

**Kenneth Huff** (*kenneth.huff@roadrunner.com*), NSTA Director, Middle Level Science Teaching, and Mill Middle School, Buffalo, N.Y.**Mary (Margo) Murphy**, Camden Hills Regional High School, Rockport, Maine**K. Renae Pullen**, Caddo Parish Public Schools, Shreveport, La.**Jay Labov**, The National Academies of Sciences, Engineering, and Medicine, Washington, D.C.**Herb Brunkhorst**, California State University, San Bernardino

A continuation of the featured panel “Enhancing Teachers’ Voices and Roles in Education Policy Making,” Friday, 2:00–3:00 PM, this session will give teachers tools and mechanisms to be adept in understanding how policy is made and how they can bring their knowledge and expertise to decision makers. Drawing on advice from the National Academies of Sciences, Engineering, and Medicine, and from the California Council on Science and Technology, this is a hands-on session with description and discussion on specifically how STEM teachers can be effective in policy making at the regional, state, and federal level.

Moderated by Susan Hackwood, Executive Director of the California Council on Science and Technology, and Andy Kotko, Chair of the California Teachers Advisory Council, and Folsom Cordova Academy for Advanced Learning in Sacramento, and presented by members of the California Teachers Advisory Council and the National Academies Teacher Advisory Council.

**Real Scientific Research in the High School Classroom***(Grades 10–College)*

Olympic 1, JW Marriott

Science Focus: GEN, NGSS

**Thomas Rutherford** (@Sternwachter; *sternwachter@netscape.net*), Sullivan South High School, Kingsport, Tenn. Scientific research has been occurring at Sullivan South High School since 2005. What was once an after-school program has grown into an actual class with students now publishing in peer-reviewed journals.**AMSE-Sponsored Session: George W. Carver Conversation Series on Diversity and Equity***(General)* Platinum Ballroom Salon A, JW Marriott

Science Focus: ETS, LS, SEP

**Cherry Brewton** (*cbrewton@georgiasouthern.edu*), Evans County Community Center, Claxton, Ga.**Robert Ferguson** (*r.l.ferguson1@csuohio.edu*), Cleveland State University, Cleveland, Ohio

George Washington Carver symbolizes the knowledge that diverse students can bring to science. Help plan equitable actions to create opportunities for all students to learn.

**Online Natural History Collections: Bringing Real-World Science into Every High School Classroom***(Grades 9–12)* Platinum Ballroom Salon E, JW Marriott

Science Focus: LS1, LS2, LS3

**Molly Phillips** (@iDigBio; *mphillips@flmnh.ufl.edu*), Florida Museum of Natural History, Gainesville**Amy Bolton** (*boltonam@si.edu*), Smithsonian Institution, Washington, D.C.**Elizabeth Ellwood** (@libbyellwood; *eellwood@bio.fsu.edu*), Florida State University, Tallahassee

We will present real-world science experiences for high school teachers to integrate into the classroom using digital natural history collections and data from several national projects and institutions.

**Equity Within NGSS: Strategies for Culturally Responsive Teaching in the Science Classroom***(Grades K–12)* Platinum Ballroom Salon I, JW Marriott

Science Focus: GEN, SEP6, SEP7, SEP8

**Michael Nocella** (*micnoc@d219.org*), Niles West High School, Skokie, Ill.**Deb Morrison** (@educatordeb; *educator.deb@gmail.com*), University of Washington, Seattle

Uncover implications of white privilege, stereotype threat, and microaggressions from a science teacher and equity researcher to become a student advocate through culturally responsive teaching.

### The Magic of Inquiry

(Grades 7–College) Platinum Ballroom Salon J, JW Marriott

Science Focus: ETS1, PS1, PS3, SEP

**Steven Sogo** (*ssogo@lbusd.org*), Laguna Beach High School, Laguna Beach, Calif.

Scientific inquiry is the cornerstone of engaging science courses. Join in for suggestions on injecting scientific inquiry and engineering design into daily lessons. Receive illustrative lessons from a variety of topics in chemistry, including acid-base chemistry, equilibrium, and reaction stoichiometry.

### Using Districtwide Teacher Teams to Build Foundations for High School NGSS Courses

(Grades 9–12)

Plaza 1, JW Marriott

Science Focus: PS, CCC, SEP

**Miranda Messer** (*@Messer3Miranda*; *miranda.messer@louisville.edu*), Jefferson County Public Schools, Louisville, Ky.

**Randi Stearman** (*@MsStearman*; *randi.stearman@jefferson.kyschools.us*), Moore High School, Louisville, Ky.

Presider: LeeAnn Nickerson, Jefferson County Public Schools, Louisville, Ky.

We will share the process and products of an ongoing project involving cohorts of physics and chemistry teachers in an urban district to develop NGSS courses.

### Wonderful Watersheds!

(Grades 2–12)

Plaza 3, JW Marriott

Science Focus: ESS2.C, ESS2.D, ESS3, ETS, LS2, CCC1, CCC2, CCC4, CCC7, SEP

**Dorian Janney** (*@JanneyDorian*; *dorian.w.janney@nasa.gov*), NASA Goddard Space Flight Center, Greenbelt, Md.

Get background on the science behind watershed regions and learn how NASA satellites collect data to better understand and protect these essential environments.

### How to Mentor Students in Science Fair #novolcanoes

(Grades 6–12)

501C, Convention Center

Science Focus: GEN, SEP

**Cara Stephens** (*@ScienceStephens*; *cara.stephens@edmond-schools.net*), Cimarron Middle School, Edmond, Okla.

**Kaytlyn Goodwin** (*good7860@vandals.uidaho.edu*), McCall Outdoor Science School, McCall, Idaho

Interested in science fairs, but have reservations? Learn how to successfully start a science fair at your school and engage students in authentic science research.



### Urban-Based Partnerships to Support the K–6 Foundations of CCSS ELA and NGSS

(Grades P–6)

502A, Convention Center

Science Focus: GEN, NGSS

**Molly Porter** (*mollyprtr@gmail.com*), Natural History Museum of Los Angeles County, Los Angeles, Calif.

**Lillian Valadez-Rodela** (*lillian.valadez-rodela@lausd.net*), Los Angeles (Calif.) Unified School District

**Lynn Kim John** (*@UCLAScienceProj*; *ljohn@gseis.ucla.edu*), UCLA Center X, Los Angeles, Calif.

Hear how LAUSD, the UCLA Science Project, and informal science organizations, such as the Natural History Museum of Los Angeles County, came together to provide opportunities for teachers to engage in learning. With a focus on elementary teachers' understanding of the CCSS ELA and the teaching of science, Engaging Young Minds (EYM) is now in its 5th year of implementation and continues to impact students' science experience all over the Los Angeles region. Come learn about ways to develop partnerships in your region!

### Pinball Machines and PBL

(Grades 6–8)

504, Convention Center

Science Focus: PS2.A, CCC2, SEP6

**October Smith** (*@octobersmith*; *osmith@lcisd.org*), Lamar Consolidated ISD, Rosenberg, Tex.

See how middle school students use their knowledge of force, motion, and simple machines to construct working tabletop pinball machines in this Project-Based Learning environment.

### Story and Poetry of Science

(Grades 4–7)

505, Convention Center

Science Focus: ESS2, ESS3

**Nicolette Torres** (*ntorres@scholarsacademy.org*) and **Christy Hinkelman** (*chinkelman@scholarsacademy.org*), MetroLina Regional Scholars Academy, Charlotte, N.C.

Project-Based Learning will be reviewed through the language arts lens. Leave with ideas and strategies—from silent film to ballad poetry to theater.

### Before and After Retirement: Practicalities and Possibilities

(Grades P–12)

507, Convention Center

Science Focus: GEN

**Teshia Birts**, Senior Director of Membership Development and Chapter Relations, NSTA, Arlington, Va.

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.

### Argumentation Toolkit: Resources for Developing a Classroom Culture for Scientific Argumentation

(Grades 5–8) 513, Convention Center

Science Focus: GEN, SEP7

**María González** ([gonzaldx@bc.edu](mailto:gonzaldx@bc.edu)) and **Katherine McNeill** ([kmcneill@bc.edu](mailto:kmcneill@bc.edu)), Boston College, Chestnut Hill, Mass.

**Suzanna Loper** ([@sjloper](mailto:@sjloper); [sjloper@berkeley.edu](mailto:sjloper@berkeley.edu)), The Lawrence Hall of Science, University of California, Berkeley

For those interested in supporting preservice and current teachers' learning of scientific argumentation, we will share a website with multimedia resources, such as classroom videos.



### STEAMING Along with DaVinci: Integrating Science and Engineering with the Arts in an Elementary Classroom

(Grades K–5) 515B, Convention Center

Science Focus: ETS, CCC, SEP1, SEP2, SEP3, SEP6

**Fred Estes** ([@Fredsci](mailto:@Fredsci); [festes@nuevaschool.org](mailto:festes@nuevaschool.org)), The Nueva School, Hillsborough, Calif.

Come experience an elementary science and engineering unit integrated with the visual arts and creativity, inspired by the life and work of Leonardo da Vinci.

### Robotics and Physical Science

(Grades 4–6) Kentia Hall M, Convention Center

Science Focus: ETS1.B, ETS2.A, PS2.A, PS3.C, CCC2, CCC4, SEP1, SEP2, SEP8

**Tom Lough** ([tom.lough@gmail.com](mailto:tom.lough@gmail.com)), Retired Educator, Round Rock, Tex.

**Ashley Wilwayco** ([ashley\\_wilwayco@roundrockisd.org](mailto:ashley_wilwayco@roundrockisd.org)), Caldwell Heights Elementary School, Round Rock, Tex.

How could fifth-graders use robotics to explore and demonstrate their understanding of physical science concepts? Come to this session to find out!

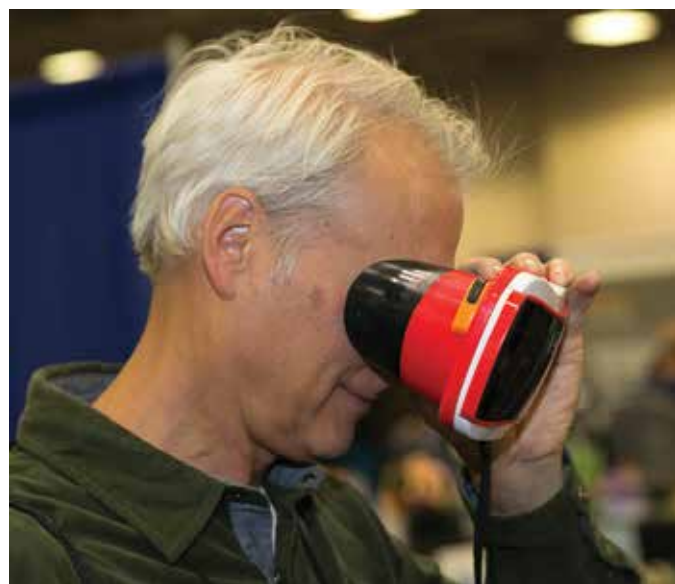
### Polymers: Basics for the Science Classroom

(Grades 7–12) Kentia Hall O, Convention Center

Science Focus: PS1.A

**Debbie Goodwin** ([nywin@hotmail.com](mailto:nywin@hotmail.com)), Retired High School Science Teacher, Chillicothe, Mo.

Simple demonstrations, labs, and activities bring STEM-relevant polymers into your curriculum. Concepts include formation, classification, structure, and properties. I'll share NGSS correlations and hand out a CD of activities/information.



—Photo courtesy of Mike Weiss

### Science from the Ends of Earth: Nat Geo Fellows Bring Field Experiences into the Classroom

(Grades 6–12) Kentia Hall P, Convention Center

Science Focus: ESS, LS, PS, INF, CCC, SEP

**Louise McMinn** ([@CTSciTeach](mailto:@CTSciTeach); [lmcminn@stamfordct.gov](mailto:lmcminn@stamfordct.gov)), Scofield Magnet Middle School, Stamford, Conn.

**Tim Martin** ([tmartin@greensboroday.org](mailto:tmartin@greensboroday.org)), Greensboro Day School, Greensboro, N.C.

**David Walker** ([@mrwalkerlasa](mailto:@mrwalkerlasa); [david.walker@austinisd.org](mailto:david.walker@austinisd.org)), Liberal Arts and Science Academy, Austin, Tex.

**Sara Plowman** ([splowman@piedmont.k12.ca.us](mailto:splowman@piedmont.k12.ca.us)), Millennium High School, Oakland, Calif.

Learn how National Geographic Grosvenor Fellows transformed expeditions of the Arctic, Antarctic, and the Galápagos into engaging 3-D lessons for life, Earth, and physical science.

### INF Real-World Three-Dimensional Environmental Science

(Grades 10–College) West Hall B-5, Convention Center

Science Focus: ESS2, ETS, LS2, LS4, INF

**Ben Smith** ([ben.smith@alumni.duke.edu](mailto:ben.smith@alumni.duke.edu)), Palos Verdes Peninsula High School, Rolling Hills, Calif.

Engage in a multidisciplinary application of NGSS to environmental science. Successful, real-world science implementation methods that support three-dimensional learning will be highlighted.

## 9:30–10:30 AM Hands-On Workshops

### A Window into Student Sense-Making

(Grades 6–College) Diamond Ballroom Salon 2, JW Marriott  
Science Focus: GEN, NGSS

**Sara Dozier** (@saradozier), Stanford University, Stanford, Calif.

Learn a clear system for understanding how your students make sense of science. Conduct a lab investigation and then explore student work samples.



### NSTA Press® Session: Solar Science = NGSS-Focused Solar Astronomy Experiences + Preparation for the All American Total Solar Eclipse

(Grades 5–9) Diamond Ballroom Salon 3, JW Marriott  
Science Focus: ESS, CCC, SEP

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

NSTA recently published *Solar Science*, a solar astronomy curriculum resource that is NGSS focused and prepares you for the 2017 solar eclipse. Come explore some of these effective learning experiences.

### Improving Instruction Through Better Assessments: A Framework for Teacher-Leaders

(Grades 6–12) Diamond Ballroom Salon 7, JW Marriott  
Science Focus: GEN

**Eric Hall** (@HallScience; eric.hall@dmschools.org), Hoover High School, Des Moines, Iowa

Are you using data to inform instruction in all classrooms? As teacher leaders, we strive to support staff in their efforts to create meaningful experiences for diverse learners. We will discuss concrete strategies to do this using experimental design as the context.

### Promoting a Growth Mind-Set: Revision Strategies for Improving Students' Explanatory Writing

(Grades 6–12) Diamond Ballroom Salon 9, JW Marriott  
Science Focus: GEN, SEP6, SEP7

**Deanna Digitale-Grider** (dddigitale@gmail.com), Solorio Academy High School, Chicago, Ill.

**Alissa Berg** (alissaberg@gmail.com), Academy for Urban School Leadership (AUSL), Chicago, Ill.

Equip yourself with tools for student-driven revision of written work. Walk away with strategies to help students self- and peer-assess their work and improve it.

### ASTC-Sponsored Session: Neuroscience and Society: Conversations Connecting Brain Development and Social Constructs

(Grades 9–12) Olympic 3, JW Marriott  
Science Focus: ETS, LS, SEP4, SEP7, SEP8

**Jayatri Das** (@JayatriDas; jdas@fi.edu), The Franklin Institute, Philadelphia, Pa.

**Jaskiran Kaur** (jkaur@boyslatin.net), Boys' Latin of Philadelphia, Pa.

**Jonathan Fabrey** (@psyfabrey; jfabrey@gmail.com), Central High School in Philadelphia, Pa.

Learn about a new curriculum for high school neuroscience, using hands-on activities to take emerging science into real-world applications like law, health, and education.

### Electric Art

(Grades 4–College) Platinum Ballroom Salon B, JW Marriott  
Science Focus: ETS, PS

**Victoria Eng** (victoria.eng@pinecrest.edu), Pine Crest School, Fort Lauderdale, Fla.

Using recycled materials, engineering principles, and creative design, the Electric Art project presents participants with a cross-curricular application of physics infused with art.

### Developing Interdisciplinary Assessments

(General) Platinum Ballroom Salon G, JW Marriott  
Science Focus: GEN

**Carrie Ball** and **JoAnna Josey**, Severn School, Severna Park, Md.

Receive a framework and strategies for designing and implementing interdisciplinary assessments that are both project based and student centered.



### Science Coding: Combining Science and Computational Thinking

(Grades 3–5) 502B, Convention Center  
Science Focus: ETS, CCC1, SEP4, SEP5, SEP8

**Johannes Strobel** (strobelj@missouri.edu), University of Missouri, Columbia

Join us to experience how to combine your science lessons with a coding extension. Students engage in early algorithmic thinking while figuring out the best recipe for a toothpaste or how to program a robot to collect data for further investigation.



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**NGSS Yes, Humans Really Do Cause Earthquakes: Hydraulic Fracturing, Wastewater Injection, and Earthquakes**

(Grades 7–College) *515A, Convention Center*  
Science Focus: ESS2.B, ESS3.B, ESS3.C, CCC1, CCC4, SEP1, SEP3, SEP4, SEP6, SEP7, SEP8

**John Taber** (*taber@iris.edu*) and **Michael Hubenthal** (*@IRIS\_EPO; michael.hhubenthal@iris.edu*), IRIS, Washington, D.C.

Explore the “hot topic” of induced earthquakes with your student through an activity built on the Argument-Driven Inquiry framework that supports three-dimensional learning.

**Teaching and Learning—Outdoors and Active!**

(Grades 4–5) *Kentia Hall C, Convention Center*  
Science Focus: GEN, INF, NGSS

**Sandra Derby** (*stderby@ucanr.edu*), California Project Learning Tree, Davis

A winning combination! We will combine taking STEM outside with taking stewardship action to demonstrate how environmental issues, STEM strategies, and place-based connections enhance student learning.

**STEMifying Storybooks: A Planning Guide Using Storybooks to Integrate Science and Engineering in Elementary Classrooms**

(Grades P–5) *Kentia Hall E, Convention Center*  
Science Focus: GEN, SEP

**Kevin Hill** (*khill@wcboc.org*) and **Brian Raygor** (*@Science-WCBOE; braygor@wcboc.org*), Wicomico Country Public Schools, Salisbury, Md.

Discover how to plan lessons and units that integrate science, engineering, and other content areas into your reading time by starting with any storybook. Take home a CD with classroom resources.

**Water Wheel Challenge: An Engineering Design Lesson for Grades 3–8 Students**

(Grades 3–8) *Kentia Hall F, Convention Center*  
Science Focus: ETS1, PS

**David Crowther** (*@Dtcrowther; crowther@unr.edu*), NSTA President-Elect, and University of Nevada, Reno

**Lou Loftin** (*lloftin@washoeschools.net*), Nevada’s Northwest Regional Professional Development Program, Reno

**Catherine Pozarski-Connolly**, University of Nevada, Reno

Churn new learning in your classroom by designing and building a water wheel. Engage in the engineering design process and explore potential and kinetic energy.

**Destination: NASA...21st-Century Skills and STEAM**

(Grades K–5) *Kentia Hall G, Convention Center*

Science Focus: ESS1

**Margaret Duke** (*@DeniseDuke7; @FLEEagles; dduke@richland2.org*) and **Marian Scullion** (*@FLEEagles; mscullio@richland2.org*), Forest Lake Elementary School, Columbia, S.C.

Join us and use NASA resources to collaboratively plan and implement integrated multidisciplinary units for K–5, like the one we’ll share—“Destination: International Space Station!”

**Helping Teachers and Students Learn Science through Picture Books!**

(Grades K–8) *Diamond Ballroom, Seaton 20, JW Marriott*  
Science Focus: GEN

**Douglas Hummings** (*dhumings@elkhart.k12.in.us*), River-view Elementary School, Elkhart, Ind.

**Holly O’Connell** (*hoconnell@elkhart.k12.in.us*), Pinewood Elementary School, Elkhart, Ind.

Explore ways to integrate science and ELA with picture books to help students master science concepts, while at the same time enforcing literacy standards!

**INF Building Bridges Between Elementary and Middle School Science Through STEM**

(Grades 2, 6–8) *Kentia Hall J, Convention Center*  
Science Focus: INF, SEP

**Justine Wood** (*justine.wood@redclay.k12.de.us*) and **Jill Szymanski** (*jill.szymanski@redclay.k12.de.us*), Brandywine Springs School, Wilmington, Del.

Middle school students bring NGSS to life through a partnership with a local elementary school. Receive the tools to start your own after-school program.

**Your Ecological Footprint in a 3D NGSS Classroom**

(Grades 5–College) *Kentia Hall K, Convention Center*  
Science Focus: ESS

**Laurel Kohl**, The Institute for Sustainable Energy, Willimantic, Conn.

The world’s resources aren’t finite, so what alternatives are there? This NGSS three-dimensional lesson from *ctenergyeducation.com* allows grades 4–12 students to explore their impact on the world.

### Mixing Colored Lights and Pigments: RGB vs. CMYK: A STEAM Approach

(Grades 7–12) *Kentia Hall N, Convention Center*  
 Science Focus: ETS1.B, ETS1.C, ETS2, PS1.A, PS4.B, PS4.C, CCC2, CCC5, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

**Franco Ramunno** (*franco.ramunno@colband.com.br*) and **Renato Villar** (*renato.villar@colband.com.br*), Colégio Bandeirantes, São Paulo, Brazil

Add vibrancy to your classroom by studying color based on hands-on activities that mix colored lights and pigments in order to compare the RGB and CMYK color models.

### Going MAD at the Zoo: Bridging Mean Absolute Deviation and Math Standards to Animal Behavior Field Studies

(Grades 5–9) *Kentia Hall R, Convention Center*  
 Science Focus: GEN, INF, SEP4, SEP5

**Colleen Owen** (*cowen@wcs.org*) and **Christine DeMauro** (*cdemauro@wcs.org*), Wildlife Conservation Society, Bronx, N.Y.

**Matthew Mirabello** (*@MattJMirabello; mmirabello@amnh.org*), American Museum of Natural History, New York, N.Y.

**Gina Tesoriero** (*@STEMsuccessEdu; ginatoriero@gmail.com*), M.S. 319 Maria Teresa Mirabal School, New York, N.Y. Master the measures of variability to help students graph and analyze authentic zoo animal behavior data collected to support their mathematical and scientific reasoning.

### Anatomy Rocks!

(Grades 9–12) *Kentia Hall S, Convention Center*  
 Science Focus: LS

**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.

Join us in sharing strategies that allow all students to be successful in learning anatomical topics with activities like Vampire Metabolism, Anatomical Twister, and more.

### The Augmented Reality Sandbox: Experiences of Use in the Classroom

(Grades 5–8) *Petree Hall D, Convention Center*  
 Science Focus: ESS2.C, ESS3.B, ESS3.C, ETS1, CCC2, CCC6, CCC7, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7

**David Thesenga** (*@DCThesenga; dthesenga@gmail.com*), Timberline PK–8, Longmont, Colo.

An Augmented Reality Sandbox provides a unique opportunity for students to engage in an exploration of landforms, topography, and water flows. A sandbox will be on hand to experiment with and a discussion of successes and pitfalls of sandbox building and implementation in the classroom.

### Story Starts to STEM: Using Children’s Literature to Enhance Your STEM Curriculum

(Grades P–5) *West Hall B-2, Convention Center*  
 Science Focus: ETS1

**Jennifer Williams** (*@ScienceJennifer; jenniferwilliams@newmanschool.org*), Isidore Newman School, New Orleans, La. Promote your students’ enthusiasm and understanding of STEM concepts by integrating children’s literature into project-based experiments and activities. Join in for a seamless blend of “story time” and STEM. Leave with a bibliography of suggested titles and cooperating literacy activities.

### Your Kids Can, Too! Scientific Argumentation for All Students

(Grades 5–9) *West Hall B-3, Convention Center*  
 Science Focus: LS1.B, CCC1, 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 and all learners.

### 9:30–11:00 AM Presentation

#### NGSS@NSTA Share-a-Thon

(Grades K–12)

151, Convention Center

Science Focus: GEN, NGSS

Presider: Jennifer Horak, Assistant Executive Director, Program Integration, NSTA, Arlington, Va.

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!

### 9:30 AM–1:30 PM Special Session

#### Hydrogen Horizon Automotive Challenge

(General)

Booth #435, Exhibit Hall, Convention Center

Science Focus: GEN

Join us for the Hydrogen Horizon Automotive Challenge. This Toyota-funded after-school STEM program has high school students design, build, and race their own 1:10 scale hydrogen-powered RC cars. Twenty teams from Southern California will battle head-to-head in a four-hour endurance race. Stop by the Hydrogen Education booth (#435) on Thursday and Friday to test-drive a car and learn more about their program and hydrogen fuel cell vehicles in California. Attendees with the best lap times will have an opportunity to win science equipment from Horizon Educational. Visit [bit.ly/2njlYid](http://bit.ly/2njlYid) for more details.



### 10:00–10:30 AM Presentations

#### Implementing 3D Printing Across the K–12 Curriculum

(Grades K–12)

Platinum Ballroom Salon D, JW Marriott

Science Focus: ETS, SEP2, SEP5, SEP6

**Ryan Erickson**, Cedar Park Elementary STEM School, Apple Valley, Minn.

3D printing is all the rage. Without a good, solid, comprehensive plan, however, its value quickly diminishes. Come see how one district's K–12 approach to 3D printing is leading to greater student engagement and success. By implementing a scaffolded plan using 3D printer hardware and software, your students can also experience the excitement that comes with this technology.

#### A Simple New Design for a Microgravity Drop Box for Classroom Use

(Grades 4–12)

Platinum Ballroom Salon H, JW Marriott

Science Focus: ETS2.A, PS2

**Mark Malone** ([mmalone@uccs.edu](mailto:mmalone@uccs.edu)), University of Colorado at Colorado Springs

Learn to create a "Microgravity Drop Box" to enable students observe common objects in a weightless environment. Use a webcam and your classroom computer to record videos in slow motion or real time.

#### Using Formative Assessment and UDL: Strategies to Support All Students' Learning of Properties of Matter

(Grades K–8)

506, Convention Center

Science Focus: GEN

**Dante Cisterna** ([dicister@gmail.com](mailto:dicister@gmail.com)) and **Deborah Hanuscin** ([hanuscind@missouri.edu](mailto:hanuscind@missouri.edu)), University of Missouri, Columbia

Hear how to connect and use principles of formative assessment and Universal Design for Learning to support all students' scientific learning



### Scientific Literacy—From Idea to Implementation with Middle School Students

(Grades 6–8) 514, Convention Center  
Science Focus: GEN, SEP4, SEP8

**Samantha Koehler** ([samantha.koehler@adelsoncampus.org](mailto:samantha.koehler@adelsoncampus.org)), The Dr. Miriam and Sheldon G. Adelson Educational Campus, Las Vegas, Nev.

**Paula Garrett** ([paula.jacoby.garrett@gmail.com](mailto:paula.jacoby.garrett@gmail.com)), Research Scientist and Educator, Henderson, Nev.

Learn about our journey to implement a science literacy program in our middle school. We implemented a tiered approach to science literacy and will discuss the successes and downfalls of the program, our current version, and future plans for expansion.

### Inquiry Learning in Elementary Science Classrooms: A High School–Elementary Collaboration

(Grades K–6) Kentia Hall A, Convention Center  
Science Focus: GEN, NGSS

**Leana Peltier** ([lpeltier42@gmail.com](mailto:lpeltier42@gmail.com)), Sleepy Hollow High School, Tarrytown, N.Y.

Come listen to the progress of elementary school teachers in designing science lessons focused on the inquiry method.

### Engineering with Ease!

(Grades K–5) Kentia Hall B, Convention Center  
Science Focus: ETS

**Gretchen Bazela** ([gbazela@cscmail.org](mailto:gbazela@cscmail.org)), **Katharine Mendivil** ([kmendivil@cscmail.org](mailto:kmendivil@cscmail.org)), and **Elena Lopez** ([@cascience-center](mailto:@cascience-center); [elopez2@cscmail.org](mailto:elopez2@cscmail.org)), California Science Center, Los Angeles

**Jennifer Chen** ([jchen@rowland.k12.ca.us](mailto:jchen@rowland.k12.ca.us)) and **Marie Lam de Krieger** ([mldkrieger@rowlandschools.org](mailto:mldkrieger@rowlandschools.org)), Telesis Academy of Science & Math, West Covina, Calif.

California Science Center’s Engineering with Ease showcases K–5 engineering lessons and resources, developed by a team of teachers and museum educators to emphasize content connections, accessibility, and relevancy.

### 10:00–11:30 AM Exhibitor Workshops Performance Assessments—Engaging and Fun!

(Grades 5–8) 153A, Convention Center  
Science Focus: GEN, NGSS

Sponsor: TCI

**Thoa Tran**, TCI, Mountain View, Calif.

Join TCI as we examine performance assessments as resources for students to demonstrate their mastery of NGSS performance expectations. Learn how to create your own performance assessments, including a story line, student guidelines, and rubrics that truly show the three-dimensional aspect of NGSS. Take home complete performance assessments for immediate use in the classroom.

### A Visual Journey Through the Human Cell with Watercolor Landscapes

(Grades 6–College) 153B, Convention Center  
Science Focus: LS1.A, PS, CCC1, CCC6, SEP1, SEP2, SEP5

Sponsor: MSOE Center for BioMolecular Modeling

**Tim Herman** ([herman@msoe.edu](mailto:herman@msoe.edu)), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Explore the molecular world using vibrant watercolor landscapes that provide cellular context within which proteins function. David Goodsell’s Tour of the Human Cell traces production and secretion of antibodies by a plasma cell. His new Antibodies in Action illustrates how antibodies react with the influenza virus to block the infection cycle.

### The Power of Game-Based Learning in the Science Classroom

(Grades 7–12) 153C, Convention Center  
Science Focus: PS1.A, PS1.B

Sponsor: PlayMada Games

**Lindsay Plavchak** ([lindsayp@playmadagames.com](mailto:lindsayp@playmadagames.com)) and **Edward Wang** ([edwardw@playmadagames.com](mailto:edwardw@playmadagames.com)), PlayMada Games, New York, N.Y.

Discover Collisions™, an exploratory and systems-based digital chemistry game! Hear from middle school and high school teachers who have integrated this rigorous curricular game into their instruction. Walk away with game-based learning implementation strategies to deepen your students’ learning experiences. Don’t forget to bring a laptop or tablet to play!

**Oh, Ick! Science Experiments Guaranteed to Gross You Out**

(Grades 4–6) 301 AB, Convention Center

Science Focus: LS4.C, PS1.A, PS2.A

Sponsor: Publisher Spotlight

**Joy Masoff** ([joy@fivepondspress.com](mailto:joy@fivepondspress.com)), Workman Publishing Co., New York, N.Y.

Kids love gross things—especially when those gross things can be made in a beaker or a bag as part of a science experiment...and when they occasionally get to eat the results! Joy Masoff, author of *Oh, Ick!*..., will discuss why kids love to be grossed out by science and share some experiments from the book—ranging from biology to chemistry to physics—that are sure to encourage class participation, enthusiasm, and lots of laughter. Q&A at the end.

**The Junior Duck Stamp Program: Integrating Science with Art**

(Grades K–12) 303 AB, Convention Center

Science Focus: LS2, LS4

Sponsor: U.S. Fish and Wildlife Service

**Suzanne Fellows** ([suzanne\\_fellows@fws.gov](mailto:suzanne_fellows@fws.gov)), U.S. Fish and Wildlife Service, Falls Church, Va.

**Tamara Zeller** ([tamara\\_zeller@fws.gov](mailto:tamara_zeller@fws.gov)), U.S. Fish and Wildlife Service, Div. of Migratory Bird Management, Anchorage, Alaska

The Junior Duck Stamp Program for grades K–12 integrates science and visual arts. Students research the science of wetland environments and waterfowl and then express their findings through art. Join this hands-on workshop and learn about four new guides, tailored to different audience groups to encourage students to explore, investigate, express, and share waterfowl and wetland conservation.

**Make Science Come to Life Through Modeling with LEGO® Education**

(Grades 1–4) 304C, Convention Center

Science Focus: ETS

Sponsor: LEGO Education

**Jenny Nash**, LEGO Education, Billund, Jylland, Denmark  
Looking for engaging ways to model sciences and teach computational thinking? See how programming can bring modeling to life in your science classroom, while teaching NGSS requirements including engineering. During this session, you will build a science model using LEGO bricks, motors, and sensors, and program that model to complete tasks.

**Engaging Your Students in 3D Problem-Based Learning: Making It Happen**

(Grades K–5) 305, Convention Center

Science Focus: GEN, NGSS

Sponsor: Project Lead The Way

**Kristen Champion-Terrell** and **Ginger Teague**, Project Lead The Way, Inc., Indianapolis, Ind.

How can you facilitate learning experiences that engage students in real-world problem solving integrated with NGSS three-dimensional learning? Join us for a hands-on experience with PLTW's Activity-, Project-, Problem-based (APB) instructional approach and walk away with tools to bring a problem-based unit tied to NGSS 3D learning to your classroom.

**Integrating Chromebook with Vernier Technology**

(Grades 3–College) 402A, Convention Center

Science Focus: ETS, PS1, PS2

Sponsor: Vernier Software & Technology

**Rick Rutland** ([info@vernier.com](mailto:info@vernier.com)), Five Star Education Solutions, Stockdale, Tex.

Use Vernier sensors with Chromebooks to conduct hands-on experiments such as “Graphing Your Motion” and “Grip Strength Comparison.” See a demonstration of our new Go Direct wireless and USB sensors that connect directly to Chromebooks—no interface needed. Explore our wide range of digital tools that promote understanding of science concepts.

**Elementary Science with Vernier**

(Grades 3–6) 402B, Convention Center

Science Focus: ETS2, PS2, PS3

Sponsor: Vernier Software & Technology

**David Carter** ([info@vernier.com](mailto:info@vernier.com)), Vernier Software & Technology, Beaverton, Ore.

Learn how to incorporate Vernier sensors and data-loggers into your elementary classroom in this hands-on STEM workshop. Conduct an activity from our award-winning *Elementary Science with Vernier* lab book, which promotes student understanding of science, mathematics, and technology using an integrated teaching approach.

**Flinn Scientific's STEM Design Challenge™ Activities**

(Grades 5–12) 403A, Convention Center

Science Focus: ETS1, SEP

Sponsor: Flinn Scientific, Inc.

**Mike Marvel** ([mmarvel@flinnsci.com](mailto:mmarvel@flinnsci.com)) and **Janet Hoekenga** ([jhoekenga@flinnsci.com](mailto:jhoekenga@flinnsci.com)), Flinn Scientific, Inc., Batavia, Ill.

This hands-on interactive workshop will help you integrate STEM scientific inquiry and engineering design principles

into your curriculum. Join Flinn Scientific in a “build-it-yourself” lab project that will actively engage your students and increase their understanding of concepts that cut across scientific disciplines. Interactive demonstrations highlight science and engineering practices such as reasoning based on the evidence. Handouts for all activities!

### How the Teen Brain Learns

(Grades 6–12) 403B, Convention Center

Science Focus: GEN

Sponsor: Society for Neuroscience

**Frances Jensen**, Perelman School of Medicine, Philadelphia, Pa.

Teen brains are primed for learning—fast—it’s a double-edged sword. They can breezily master biology or mathematics. Getting hooked on alcohol, drugs, or nicotine can be just as easy, because addictions are a type of learning, too. Explore that paradox and more with Dr. Frances Jensen.

### Investigate Photosynthesis and Cellular Respiration with Algae Beads

(Grades 9–College) 404 AB, Convention Center

Science Focus: LS

Sponsor: Bio-Rad Laboratories

**Leigh Brown** ([leigh\\_brown@bio-rad.com](mailto:leigh_brown@bio-rad.com)), Bio-Rad Laboratories, Hercules, Calif.

Use algae beads in a colorimetric assay to study both photosynthesis and cellular respiration in authentic inquiry investigations (AP Biology Big Idea 2b Labs 5 and 6). Learn how to extend this lab to study the effects of light intensity, light color, temperature, and other organisms on these processes.

### Three Steps to AP Exam Success

(Grades 9–12) 406 AB, Convention Center

Science Focus: GEN

Sponsor: McGraw-Hill Education

**Gordon Massengill**, Lyceum Academy of New Hanover High School, Wilmington, N.C.

The Lyceum Academy implemented a three-part approach to teaching AP Biology, and increased their average exam score by 30% in just one year. Learn how to set students up for success with effective course preparation, support during the course, and powerful exam prep.

### 3-2-1 Blast Off!

(Grades 2–8) 408A, Convention Center

Science Focus: LS, PS2, PS3.A, PS3.B, PS3.C, CCC2, CCC5, CCC7, SEP1, SEP3, SEP4

Sponsor: Educational Innovations, Inc.

**Tami O’Connor**, Educational Innovations, Inc., Bethel, Conn.

What student doesn’t like a burst of energy?! Elementary and middle school teachers—join us for this fast-paced hands-on workshop that covers potential and kinetic energy, forces, motion, variables, Newton’s laws, and more! Lesson ideas, giveaways, and door prizes!

### Modeling Structure and Function with Help from Our Feathered Friends

(Grades 9–12) 408B, Convention Center

Science Focus: LS1.A

Sponsor: Houghton Mifflin Harcourt

**Stephen Nowicki** ([snowicki@duke.edu](mailto:snowicki@duke.edu)), Duke University, Durham, N.C.

Who doesn’t like birds? Join Dr. Stephen Nowicki, internationally known avian scientist and Duke University professor, as he uses his research findings, fun bird facts, demonstrations, and hands-on activities to more effectively teach your students the principles of modeling structure and function!

### Assess the NGSS: Formative Assessment Strategies for Grades K–8

(Grades K–8) 409 AB, Convention Center

Science Focus: GEN, NGSS

Sponsor: Measured Progress

**Justine Hargreaves** ([info@measuredprogress.org](mailto:info@measuredprogress.org)), Measured Progress, Dover, N.H.

Learn how STEM Gauge® formative assessment resources engage students and support three-dimensional teaching and learning during the transition to the NGSS. This interactive workshop provides classroom strategies that you can implement immediately, plus assessment questions, rubrics, and formative support tools. Get a free STEM Gauge item set!

### Turn-Key STEM/Engineering Program by WhiteBox Learning

(Grades 5–College) 410, Convention Center

Science Focus: ETS1

Sponsor: WhiteBox Learning

**Graham Baughman** ([graham@whiteboxlearning.com](mailto:graham@whiteboxlearning.com)), WhiteBox Learning, Louisville, Ky.

WhiteBox Learning provides a project-, standards-, and web-based STEM Learning System. Gliders2.0, Rover2.0, Structures2.0, Prosthetics2.0, MousetrapCar2.0, Green-Car2.0, Rockets2.0, Dragster2.0, SurvivalShelter2.0, and KidWind2.0 allow students to design, analyze, and simulate their designs—and compete “virtually,” from any browser, before building their projects hands on. Engage your students in the complete engineering design process.

### Let Them Question! An Alternative Way of Understanding the Universe

(Grades 8–12) 501 AB, Convention Center

Science Focus: ESS1, CCC, SEP

Sponsor: Perimeter Institute for Theoretical Physics

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

Letting students ask and learn from their curiosity-driven questions about the universe is a highly motivating way to engage students in cutting-edge science. This workshop will show you how to create and sustain a collaborative learning environment surrounding student questions and the learning that occurs as a result.

### BIOZONE’s NGSS Series for High School

(Grades 9–12) 503, Convention Center

Science Focus: ESS, LS

Sponsor: BIOZONE International Ltd.

**Richard Allan** ([richard@thebiozone.com](mailto:richard@thebiozone.com)), BIOZONE International Ltd., Hamilton, New Zealand

Successfully implement the high school life science and Earth and space sciences components of the NGSS approach with BIOZONE’s newest award-winning series. It is strongly focused on student inquiry and written from first principles to address all aspects of the NGSS. Attendees receive free review copies.

### Amazing Astronomical Phenomena

(Grades 6–12) 511 AB, Convention Center

Science Focus: ESS1.A

Sponsor: Simulation Curriculum Corp.

**Herb Koller** ([hkoller@simcur.com](mailto:hkoller@simcur.com)), Simulation Curriculum Corp., Minnetonka, Minn.

Stand on the surface of Mars. Explore the mysteries of a

black hole. Examine planets circling other stars for possible life. See distant objects and solar systems! Accomplish all of this and more using Simulation Curriculum’s award-winning Starry Night, which is available for all computing platforms including Chromebooks.

### Teach STEM and Make Extra Cash with RoboRobo Robotics for K–12 Grades

(Grades K–12) 512, Convention Center

Science Focus: ETS

Sponsor: Kids2GLOW

**Andrea Overton** ([info@kids2glow.com](mailto:info@kids2glow.com)), STEM Launch, Thornton, Colo.

**Tracey Calderón** ([info@kids2glow.com](mailto:info@kids2glow.com)), STEM Magnet Lab School, Northglenn, Colo.

Learn how to create a great after-school program with an easy-to-learn robotics line that teaches basic programming, mechanical skills, critical thinking, and problem solving in a fun way. Teachers can earn extra money and add STEM education into their schools. Join in for hands-on experience with the robots and programming. Leave with challenge ideas and tools to start your own after-school program, and be entered in a raffle for a free robotics kit.

### Modeling the Introduction of a New Species: NGSS Ecology

(Grades 6–9) 518, Convention Center

Science Focus: LS2.B, LS2.C, CCC4, CCC5, SEP2

Sponsor: Lab-Aids, Inc.

**Donna Markey**, Vista Visions Academy, Vista, Calif.

How does a new species affect the flow of matter and energy in an ecosystem? This card sort–style activity models the introduction of a new species with special attention to the effect on existing predators and producers...from the new SEPUP middle level Ecology unit, revised and updated for the NGSS and published by Lab-Aids. Participants will receive free samples of the activity.

**11:00–11:30 AM Presentations****The NGSS from Theory to Practice***(College)**Olympic 1, JW Marriott*

Science Focus: GEN, NGSS

**Amy Lark** (@AmyMLark; [amlark@mtu.edu](mailto:amlark@mtu.edu)), Michigan Technological University, Houghton

Receive an overview of and insights from a graduate-level professional development course offered at Michigan Technological University that introduces inservice teachers to the NGSS.

**NGSS and Global Collaboration in the Science Classroom***(Grades 4–12)**Plaza 1, JW Marriott*

Science Focus: GEN, SEP

**Carol Cao** (@carolannecao; [carolannecao@gmail.com](mailto:carolannecao@gmail.com)), Summit View Valley School, North Hollywood, Calif.**Shannon Sahabi** (@shannonsahabi; [shannon.sahabi@nisd.net](mailto:shannon.sahabi@nisd.net)), Tom C. Clark High School, San Antonio, Tex.**Joseph Isaac** (@EinsteinQue; [bootneylee2000@gmail.com](mailto:bootneylee2000@gmail.com)), Texas Tech University, Lubbock

Global collaboration links students with others around the world, where they engage in real-life science inquiry and investigations, and focuses on CCSS, NGSS, and 21st-century skills.

**Form, Storm, Norm, and Conform: Tips for STEM Partner Management***(General)**Plaza 3, JW Marriott*

Science Focus: GEN, SEP

**Meghan Groome**, The New York Academy of Sciences, New York, N.Y.

Hear how to manage partnerships with STEM professionals using Tuckman's Form, Storm, Norm, and Conform framework. Learn what's normal and how to avoid trouble!

**Simple Machines Design Challenge for Middle School Science and Math Students***(Grades 7–11)**506, Convention Center*

Science Focus: ETS, PS2.A, PS2.B, PS3.C, CCC1, CCC3, CCC4, SEP

**Anna Delia** ([adeli@hawken.edu](mailto:adeli@hawken.edu)), Hawken Lower and Middle Schools, Gates Mills, Ohio

Hear about an interdisciplinary group project where students investigate the history and physics of simple machines, design a new machine, and construct, test, and evaluate peers' designs.

**STEM on a Shoestring: How to Hit the Standards When You Have No Funding!***(Grades 5–8)**513, Convention Center*

Science Focus: GEN, NGSS

**Brandy Whitney** ([whitneybrandy@yahoo.com](mailto:whitneybrandy@yahoo.com)), Ottoson Middle School, Arlington, Mass.

Are you full of excitement about teaching STEM but low on funding? Don't worry, it can be done!

**Teaching Chemistry Content with Projects***(Grades 6–12)**Kentia Hall N, Convention Center*

Science Focus: PS, SEP

**Jordan Tidrick** (@JordieMCT; [jordantidrick@hotmail.com](mailto:jordantidrick@hotmail.com)), North Cobb High School, Kennesaw, Ga.

Find out how to incorporate projects in a chemistry classroom to teach content, collaboration, engineering practices, and unexpectedly, resilience.

**11:00 AM–12 Noon Paul F-Brandwein Lecture  
Nearby Wilderness, Novel Ecosystems, and Connecting  
to Nature**

(General)

*Petree Hall C, Convention Center*

Science Focus: LS

*Sponsored by Brandwein Institute*



**Emma Marris** (@Emma\_Marris; [e.marris@gmail.com](mailto:e.marris@gmail.com)), Environmental Writer, Klamath Falls, Ore.

Presiders: Daniel J. Bisaccio, Brown University, Providence, R.I.; and David Foord, Cooperative Extension of Sussex County, Newton, N.J.

Emma will talk about how nearby nature and overlooked wild corners in urban and suburban spaces can be used to connect students to nature. Weedy patches can be hotspots of diversity and overgrown fields are rich with data about how nature will adapt to a changing climate and the pervasive influence of humankind. Marris will make the case that thinking of nature as only large parks or protected areas far away contributes to alienation from nature and leaves out students who cannot afford to visit national parks or buy expensive gear. A recent study that showed more UK students could recognize Pokémon species than a sparrow provoked widespread horror, but don't forget that sparrows are the ultimate urban bird.

*Emma Marris has written for many magazines and newspapers, including National Geographic, Discover, the New York Times, and Slate. She holds a master's degree in Science Writing from Johns Hopkins University and worked for many years as a reporter for the journal Nature. In 2011, she published her first book, Rambunctious Garden: Saving Nature in a Post-Wild World. In 2016, she gave a TED Talk about seeing the hidden nature that surrounds us.*

**11:00 AM–12 Noon Presentations**

**NSELA-Sponsored Session: Leadership Strategies for  
Ensuring Each Student Has a STEM Future**

(Grades K–12)

*Atrium 3, JW Marriott*

Science Focus: GEN

**Bob Sotak** ([bobsotak@gmail.com](mailto:bobsotak@gmail.com)), Science/STEM Education Consultant, Edmonds, Wash.

**Brian Day** ([bday@everettsd.org](mailto:bday@everettsd.org)), Everett (Wash.) Public Schools

Strategies and tools to implement a districtwide K–12 STEM program impacting each student—identifying resources, developing a vision, and measuring progress toward that vision.



**NSTA Press® Session: Outdoor Science: A Practical  
Guide**

(Grades K–8)

*Diamond Ballroom Salon 3, JW Marriott*

Science Focus: GEN, CCC

**Steve Rich**, University of West Georgia, Carrollton

Outdoors or in, discover engaging lesson ideas with natural materials, children's books, and citizen science. We will unearth outdoor classroom basics, funding ideas, crosscutting concepts, and free seeds.

**Using Google Docs to Collaboratively Scaffold Effective  
Formal Lab Write-Ups**

(Grades 8–College)

*Platinum Ballroom Salon C, JW Marriott*

Science Focus: LS, PS, SEP8

**John Elliott**, Sweet Home Senior High School, Buffalo, N.Y.

Does teaching your biology or chemistry students how to write formal lab reports seem overwhelming? Learn how collaborative document writing can be used to scaffold the needed skills, while building a team-oriented atmosphere in the lab group.

**Advancing Scientific Literacy with Lesson Plans  
That Meet the CCSS and NGSS**

(Grades 9–12)

*Platinum Ballroom Salon E, JW Marriott*

Science Focus: GEN, NGSS

**Patrice Pages** (@ACSCHEMatters; [p\\_pages@acs.org](mailto:p_pages@acs.org)), American Chemical Society, Washington, D.C.

Are you asked to incorporate reading and writing into your lessons to support literacy in language arts? We have the right lesson plans for you!

**Evaluating Resources for Lessons That Fit the NGSS***(Grades K–12) Platinum Ballroom Salon I, JW Marriott*

Science Focus: GEN, NGSS

**Karen Mesmer** (*klmesmer@gmail.com*), Mesmer Science Education Consulting, Baraboo, Wis.**Carolyn Higgins** (*@mrshigginsri; carolyn.higgins@warwickschools.org*), Warwick (R.I.) Schools**Mary Koga** (*mkoga@bousd.us*), Brea Junior High School, Brea, Calif.

Join curators of NGSS resources for NSTA as they share how to use the EQUIP (Educators Evaluating the Quality of Instructional Products) rubric to determine what shifts are needed in existing lessons to align with the NGSS.

**The Helping Trio: Where Students Help Students Through Reading, Writing, Discussion, and Real-World Application***(Grades 6–College) Platinum Ballroom Salon J, JW Marriott*

Science Focus: ESS, LS, PS, SEP1, SEP4, SEP6, SEP7, SEP8

**Sheena Carter** (*@sheenieweenie14; sheena.m.carter@gmail.com*), Alliance College-Ready Public Schools, Los Angeles, Calif.

The Helping Trio is a strategy where students take ownership of learning in the classroom, and the teacher simply becomes the facilitator. Through a targeted close reading and guided small group discussion, students are set up to successfully apply their knowledge to real-world phenomena.

**Implementing Guided Inquiry in the Sheltered English Immersion Science Classroom***(Grades 9–12) Plaza 2, JW Marriott*

Science Focus: LS, SEP

**Don Pinkerton**, Revere High School, Revere, Mass.

Leave with strategies and techniques for implementing student-centered guided inquiry in Sheltered English Immersion (SEI) science classrooms.

**Getting Evidence of Student Understanding***(Grades 6–12) 501C, Convention Center*

Science Focus: PS, CCC

**Jill Lisius** (*jlisius@d125.org*), **Jin Kyung Hwang** (*jhwang@d125.org*), and **Dean Barr** (*dbarr@d125.org*), Adlai E. Stevenson High School, Lincolnshire, Ill.

Come see some of our favorite formative assessment methods and how we use them in an NGSS chemistry classroom.

**How Engineering Practices Differentiate for Students with Learning Disabilities***(Grades 1–12)**502B, Convention Center*

Science Focus: GEN, SEP

**Kathleen Reiss** (*kmr530@interact.ccsd.net*), West Preparatory Academy, Las Vegas, Nev

Engage in activities that offer a glimpse into the world of students with learning disabilities. After each type of learning disability experience, engineering practices will be reviewed that assist these students in understanding science content by offering multimodal instruction.

**INF Packing Your Scale Backpack: Research-Based Science Resources and Experiences for Learning About Size and Scale***(Grades 5–9)**504, Convention Center*

Science Focus: INF, CCC3

**Katherine Chesnutt** (*kmchesnutt@gmail.com*), **M. Gail Jones**, **Emily Cayton** (*@caytonscience; emcayton@ncsu.edu*), and **Megan Ennes** (*@AFishNamedMeg; meennes@ncsu.edu*), North Carolina State University, Raleigh**Rebecca Hite** (*@sciencebecca; rebecca.hite@ttu.edu*), Texas Tech University, Lubbock

Learn to pack a Scale Backpack that includes science resources meant to enhance out-of-school learning in the NGSS crosscutting concept of scale, proportion, and quantity.

**Environmental Projects Through Community Connections***(Grades 1–12)**505, Convention Center*

Science Focus: GEN, NGSS

**Martha Bjorklund** (*@mrsmcback; mbjorklund@allendale-columbia.org*), Allendale Columbia School, Rochester, N.Y.

Come discover how to connect with your community through authentic Project-Based Learning, while encouraging student creativity and depth of content in the K–12 classroom.

**Do You Need a New Science Lab?***(Grades 6–12)**507, Convention Center*

Science Focus: ETS2

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

Win a Shell Science Lab Makeover (\$20,000 value) for your school! Are you a middle school or high school science teacher in need of a science lab makeover? Attend this Shell Science Lab presentation and learn how you can apply to win the Shell Science Lab Challenge! You will have an opportunity to actually begin to complete the application and have your questions answered.

### The House Project: A Science–Math Collaborative, Cross-Curricular Design Project

(Grades 5–8) *514, Convention Center*  
Science Focus: ESS2.D, ETS1, ETS2.A, PS3.A, PS3.B, CCC3, CCC4, CCC5, SEP

**Heather Offen**, The Park School, Brookline, Mass.

Students apply their understanding of heat transfer, climate regions, and geometry in an iterative, tech-infused process to design and build a scale model of a house.

### Using Robots to Teach Science, Math, Art, and Language Arts

(Grades 3–8) *515B, Convention Center*  
Science Focus: GEN, SEP5

**Margie Hawkins** (@margiebg; [margiebg@gmail.com](mailto:margiebg@gmail.com)), Winfree Bryant Middle School, Lebanon, Tenn.

Come learn how you can BORROW robots for 4–6 weeks and teach science, math, art, and ELA lessons with robots. Robots are Chromebook compatible, too!

### Exploring Matter and Energy in Grade 5

(Grades 4–6) *Kentia Hall A, Convention Center*  
Science Focus: PS1, PS3

**Wendy Smith** (@wssmith; [wendysmith1005@gmail.com](mailto:wendysmith1005@gmail.com)), Hong Kong International School, Tai Tam

Learn how grade 5 students are exploring matter and energy throughout the year through a chemical reaction vehicle design challenge, the construction of terrariums, and more. We'll share lessons, student inquiry investigations, performance assessment tasks, the use of science notebooks and science talks, connections to literacy, and our reflections on teaching and learning with NGSS,

### Scientific Discoveries Shed Light on Karana's World: Integrating Science and Language Arts with *Island of the Blue Dolphins*

(Grades 4–6) *Kentia Hall B, Convention Center*  
Science Focus: ESS3, LS4, SEP

**Carol Peterson** ([cpeterson93023@gmail.com](mailto:cpeterson93023@gmail.com)), Channel Islands National Park, Ventura, Calif.

**Susan Chapin** ([chapins240@sbcglobal.net](mailto:chapins240@sbcglobal.net)), Ventura County Office of Education, Camarillo, Calif.

Connect science and literature through a new, interactive web resource that investigates current scientific research revealing facts related to this beloved children's novel.

### STEM + Music = A Match Made in an Integrated Classroom

(Grades K–8) *Kentia Hall L, Convention Center*  
Science Focus: GEN, SEP

**Becky Saraceno** (@b\_saraceno; [becky\\_saraceno@whps.org](mailto:becky_saraceno@whps.org)), Florence E. Smith STEM Elementary School, West Hartford, Conn.

Integrating STEM in the general music classroom? Absolutely! I will share my experiences, and together we will explore ways to further harmonize our curricula.

### Engaging Middle School Girls from Underrepresented Groups in Astronomy and Astrobiology Learning Using the Creative Arts

(Grades 5–9) *Kentia Hall Q, Convention Center*  
Science Focus: ESS1, ESS2.A, ESS2.C, ESS2.D, ESS3.C, ESS3.D, ETS2.B, LS4.A, LS4.C, LS4.D, PS3.D, CCC1, CCC2, CCC3, CCC4, CCC6, CCC7, SEP

**Aomawa Shields**, University of California, Los Angeles  
Learn about innovative activities that engage girls of all colors and backgrounds in astronomy and astrobiology learning using theater, writing, and the visual arts.

### The Great Diseases: Teaching Authentic Biomedical Science Using Case Studies Based on Primary Scientific Papers

(Grades 8–College) *Kentia Hall S, Convention Center*  
Science Focus: LS, SEP

**Marianne Prabhu** ([marianne.prabhu@gmail.com](mailto:marianne.prabhu@gmail.com)), Stuyvesant High School, New York, N.Y.

**Stephanie Tammen** (@GreatDiseases; [steph.tammen@gmail.com](mailto:steph.tammen@gmail.com)), Tufts University, Boston, Mass.

Come learn about our approach to bringing scientific literature to the classroom to build critical thinking, problem solving, authentic scientific practices, and health literacy.



### Promoting Elementary Science Literacy in Three Dimensions with the 2017 U.S. Total Solar Eclipse

(Grades K–6) *Petree Hall D, Convention Center*  
Science Focus: ESS, CCC, SEP

**Charles Fulco** (@Totality2017; [saros61@gmail.com](mailto:saros61@gmail.com)), Science Education Consultant, Otis, Mass.

Reach your goal of observing and learning real-world, three-dimensional science by preparing for and viewing the 2017 U.S. total solar eclipse! Increase science interest and literacy in your elementary students with hands-on lessons, investigations, and safe ways to observe this rare and spectacular event. Free 2017 Eclipse Educator Kits will be distributed to all attendees.



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**NSTA** National Science Teachers Association

**Science Pedagogy Toolkit: Support for NGSS Classrooms**

(Grades K–12) West Hall B-2, Convention Center

Science Focus: GEN, NGSS

**Eric Lewis** (@ELewisSF; [ericscottlewis18@gmail.com](mailto:ericscottlewis18@gmail.com)), San Francisco (Calif.) Unified School District

Investigate a toolkit for science pedagogy. This toolkit includes supports for dialogue, reading, writing, and technology for NGSS curricula and classrooms.

*In Memory of Al Guenther*

1936–2016

Please contact Nancy Guenther at [nguenther13@gmail.com](mailto:nguenther13@gmail.com) for information on classroom materials that Al wished to donate to teachers and schools.

**11:00 AM–12 Noon Hands-On Workshops**

**Explore Building Mousetrap Vehicles to Integrate Science, Technology, Engineering, and Mathematics (STEM)**

(Grades 6–College) Diamond Ballroom Salon 1, JW Marriott

Science Focus: ETS

**Alden Balmer**, McNeil High School, Austin, Tex.

Build a mousetrap vehicle and discover how to integrate science, technology, engineering, and mathematics (STEM) by modifying variables to increase speed or distance traveled.

**STEM Learning for All Students: An Integrated Teaching Model**

(Grades 6–College) Diamond Ballroom Salon 2, JW Marriott

Science Focus: GEN, SEP

**Patricia Simmons**, 2011–2012 NSTA President, and AAAS, Arlington, Va.

Come join me for energetic and innovative activities featuring the science and engineering practices from NGSS for grades 6–12 students. We will engage in selected activities that illustrate how collaboration, critical thinking, communication, and creativity are connected to the NGSS.

**Memory, Attention, and Distraction**

(Grades 8–12) Diamond Ballroom Salon 6, JW Marriott

Science Focus: LS

**Molly Malone** ([molly.malone@utah.edu](mailto:molly.malone@utah.edu)), The University of Utah, Salt Lake City

Explore the neurobiology of how the brain creates meaning from incoming information, allocates attention, and creates memories through a free curriculum module. Includes a driving simulator, multimedia presentations, games, and a kinesthetic activity. Visit [www.teach.genetics.utah.edu](http://www.teach.genetics.utah.edu) for more information.

**Are Three Trials Enough? Analyzing Investigation Data with Large Variation**

(Grades 6–10) Diamond Ballroom Salon 7, JW Marriott

Science Focus: GEN, SEP4, SEP5

**Matthew Mirabello** (@MattJMirabello; [mmirabello@amnh.org](mailto:mmirabello@amnh.org)) and **Jay Holmes** (@JholmesJay; [jholmes@amnh.org](mailto:jholmes@amnh.org)), American Museum of Natural History, New York, N.Y.

Can sample size actually change conclusions? Account for sample size and variation in the data analysis and conclusion of your science investigation. Reduce “false positives” and support richer data interpretation conversations.

**Exploring Horse Evolution in Response to a Changing Climate Through an NGSS-Focused Curriculum**

(Grades 6–12) Diamond Ballroom Salon 9, JW Marriott

Science Focus: LS4, CCC1, CCC2, CCC6, SEP

**Julie Bokor** ([jbokor@ufl.edu](mailto:jbokor@ufl.edu)), University of Florida, Gainesville

Graze the theory of natural selection with a series of lessons that address macro- and microevolutionary concepts using 3D-printed fossil horse teeth to engage in an investigation of the fossil horse record.

**ASTC-Sponsored Session: Telling the Stories of Science/ Narración de Las Historias de la Ciencia**

(Grades P–1) Olympic 3, JW Marriott

Science Focus: LS1, CCC1, CCC6

**Jennifer Jovanovic** ([jennifer@growinggreat.org](mailto:jennifer@growinggreat.org)), GrowingGreat, Manhattan Beach, Calif.

Kindergartners don’t separate science from everything else they do, and neither do we. Experiment with STEM activities supporting language arts, taught by informal science educators.

### AMSE-Sponsored Session: Unpacking the Wonders of a Tropical Excursion in Belize: An Educator's Perspective

(Grades 6–8) *Platinum Ballroom Salon A, JW Marriott*  
Science Focus: GEN, NGSS

**Pamela Gilchrist** (@pamelagilchrist; [pogilchr@ncsu.edu](mailto:pogilchr@ncsu.edu)), The Science House at North Carolina State University, Raleigh

Come learn how an experiential exploration of Belize's ecology, culture, and history can be used to educate students and teachers for the 21st century.

### Aquaponics in the Classroom: Preparation for the Multidisciplinary STEM Workforce!

(Grades 9–12) *Platinum Ballroom Salon B, JW Marriott*  
Science Focus: ESS3, ETS, LS1.C, LS2, LS4.D, PS1.B, PS2.C, PS3.B, PS3.D, PS4.C, CCC, SEP

**Jessica Day** (@projectfeed1010; [jday@systemsbiology.org](mailto:jday@systemsbiology.org)) and **Claudia Ludwig** (@projectfeed1010; @SystemsEd; [cludwig@systemsbiology.org](mailto:cludwig@systemsbiology.org)), Institute for Systems Biology, Seattle, Wash.

Examine a global crisis and model a solution. Learn to maintain an aquaponic system and integrate STEM curriculum to increase engagement and promote deep learning.

### Groovy Sounds: NGSS Investigations into Sound

(Grades 4–College) *Platinum Ballroom Salon D, JW Marriott*  
Science Focus: ETS1, PS4

**Eric Muller** ([emuller@exploratorium.edu](mailto:emuller@exploratorium.edu)), Exploratorium, San Francisco, Calif.

Tap into new learning in your classroom as we investigate the science and engineering of sound. We will design, build, and test a record player and other sound-making devices.

### “Shake It Up”: A Lesson in NGSS Engineering Design

(Grades 6–12) *Platinum Ballroom Salon F, JW Marriott*  
Science Focus: ETS1, CCC, SEP

**Clarissa Resella** (@bioteach4u; [eresella@hartdistrict.org](mailto:eresella@hartdistrict.org)), Saugus High School, Saugus, Calif.

**Erica Hardbarger** ([ehardbarger@hartdistrict.org](mailto:ehardbarger@hartdistrict.org)), Hart High School, Newhall, Calif.

Roll up your sleeves and get ready to shake it up! Experience firsthand how non-Newtonian fluids relate to liquefaction. This hands-on inquiry-based workshop will demonstrate the ease by which old favorites come alive and connect to the NGSS engineering design.

### NGSS Analyzing and Adapting Curriculum Materials to Better Support Three-Dimensional Teaching and Learning

(Grades P–12) *515A, Convention Center*  
Science Focus: GEN, NGSS

**Carrie-Anne Sherwood** (@CASherwood; [toulita@gmail.com](mailto:toulita@gmail.com)), Connecticut Science Center, Hartford

Don't reinvent the wheel! Come learn how to adapt your current curriculum materials to better support three-dimensional teaching and learning.

### Come to Organize a Science Fair in Your Primary School!

(Grades 1–5) *Kentia Hall D, Convention Center*  
Science Focus: GEN, SEP1, SEP3

**Charles Frederic** ([frederic.charles@univ-lyon1.fr](mailto:frederic.charles@univ-lyon1.fr)), Université Claude Bernard Lyon 1, Villeurbanne Cedex, France

Come discover how to imagine and organize a science fair in a primary school. You will discover scientific and technological challenges for pupils.

### Making Sense of the Sky: First Graders Construct Explanations and Communicate Their Findings Through Digital Stories

(Grades K–2) *Kentia Hall E, Convention Center*  
Science Focus: ESS1, ESS2, CCC, SEP1, SEP3, SEP4, SEP8

**Patricia Bricker** (@patricialynnb; [bricker@email.wcu.edu](mailto:bricker@email.wcu.edu)) and **Melissa Faetz** (@smemelissa; [mkfaetz@email.wcu.edu](mailto:mkfaetz@email.wcu.edu)), Western Carolina University, Cullowhee, N.C.

An Earth/Moon/Sun unit connecting science, language arts, and technology. Students collect and analyze data and create informational texts using iPads. We will create our own science digital story.

### Engage, Explore, and So Much More: K–5 Science Literacy

(Grades K–5) *Kentia Hall F, Convention Center*  
Science Focus: GEN, NGSS

**Eva Olafson** ([olafson\\_eva@salkeiz.k12.or.us](mailto:olafson_eva@salkeiz.k12.or.us)) and **Susan Luna** ([luna\\_susan@salkeiz.k12.or.us](mailto:luna_susan@salkeiz.k12.or.us)), Salem-Keizer School District, Salem, Ore.

We will emphasize engage and explore (5E planning) and how this approach reinforces student literacy skills while deepening science understanding. Session includes classroom examples.

**Who Is Your Champion? A Close Look at How Plant and Animal Structures Can Function to Help Solve a Problem**

(Grades 1–5) *Kentia Hall G, Convention Center*  
Science Focus: LS, CCC, SEP

**Caryn Walker** (*caryn.walker@jefferson.kyschools.us*), Jefferson County Public Schools, Louisville, Ky.

**Alyssa Stark**, University of Louisville, Ky.

**Roberta Ethington** (*roberta.ethington@jefferson.kyschools.us*), St. Matthews Elementary School, Louisville, Ky.

We will explore NGSS-designed lessons, focusing on how biomimicry can support science and engineering practices and three-dimensional learning in a grade 4 classroom.

**Success for Struggling Students**

(Grades 4–8) *Kentia Hall H, Convention Center*  
Science Focus: GEN, SEP

**Julianne Lichter**, Fort Worth (Tex.) ISD

Experience the differentiated classroom designed to close achievement gaps. Discover strategies for diverse learners that focus on the eight practices of science and engineering.

**Zombies in the Secondary Classroom**

(Grades 6–College) *Kentia Hall K, Convention Center*  
Science Focus: GEN, SEP1, SEP2, SEP4, SEP7, SEP8

**Leann Iacuone** (*@liacuone; mrsiacuone@yahoo.com*), John W. North High School, Riverside, Calif.

Are you a fan of *The Walking Dead* or *Call of Duty*? Join me to investigate how zombies can be used to integrate math, science, and English in a way that interests students as they learn about exponential growth curves, the spread of disease, and history using TI-Nspire calculators.

**Force and Motion: An Integrated K–8 Hands-On Approach Supporting the NGSS and CCSS ELA**

(Grades K–8) *Kentia Hall M, Convention Center*  
Science Focus: PS2, CCC2, SEP8

**Laura Robertson** (*robertle@etsu.edu*) and **Chihche Tai** (*cctai59@gmail.com*), East Tennessee State University, Johnson City

**Diana O’Neal**, Sulphur Springs Elementary School, Jonesborough, Tenn.

We will combine hands-on science investigations with supporting literacy activities to help students tell the “whole story” of force and motion.

**Conservation of Mass...and Literacy!**

(Grades 9–12) *Kentia Hall O, Convention Center*  
Science Focus: PS, CCC, SEP

**Dawnne LePretre** (*dlepretr@hawk.iit.edu*), **Selina Bartels** (*selina.bartels@cuchicago.edu*), and **Judith Lederman** (*ledermanj@iit.edu*), Illinois Institute of Technology, Chicago  
Join in for a tested chemistry lesson linking conservation of mass to nature of science, a key component of scientific literacy via claims, reasoning, argumentation, and reflective writing.

**Inquiry Beyond Four Walls: Earth Science Outdoor Learning**

(Grades 7–11) *Kentia Hall P, Convention Center*  
Science Focus: ESS2, ESS3, LS2.B, PS3.A, PS3.B, CCC, SEP

**Stephanie Burns** (*@grimsa04; grimsa04@gmail.com*) and **Jessica Conrad** (*jconrad@ccsdl.org*), Connetquot High School, Bohemia, N.Y.

**Ashley Bloch** (*@AshleySBloch; abloch@islipufsd.org*), Islip Middle School, Islip, N.Y.

**Olga Crnosija** (*ocrnosija@smithtown.k12.ny.us*), Smithtown High School West, Smithtown, N.Y.

**Catherine Hantz** (*catherine.hantz@stonybrook.edu*), Mount Sinai (N.Y.) School District

Learn to use local outdoor settings to cultivate student-centered learning while using an Earth systems approach to inquiry labs.

**Middle School Life Science Activities That Make Science Engaging and Fun**

(Grades 6–8) *Kentia Hall R, Convention Center*  
Science Focus: LS3, LS4.A, LS4.C, LS4.D, CCC1, CCC2, CCC3, CCC4, SEP1, SEP2, SEP4, SEP5, SEP7, SEP8

**Beth Newton**, Oakland Middle School, Columbia, Mo.

Join us for a hands-on workshop that shares strategies for engaging students in middle school life science (NGSS, genetics, heredity, and evolution). These lessons are packed with opportunities to excite kids about science.

**Building Models the NGSS Way**

(Grades 6–9) *West Hall B-3, Convention Center*  
Science Focus: GEN, SEP2, SEP5

**Helen Hixon** (*@HelenHixon9; helenhixon9@gmail.com*), Horace Mann School, Idyllwild, Calif.

**Kurt Holland** (*@scipolmarineman; kurt.holland@gmail.com*), Broader Impacts West, Pacific Palisades, Calif.

These aren’t your grandfather’s models. Prepare your students for upcoming standardized assessments by incorporating conceptual models into your lessons. It’s easy, we’ll show you how.

**Tools for Scaffolding Argumentation to Engage Students and Build Understanding**

(Grades 6–9) *West Hall B-4, Convention Center*  
 Science Focus: ESS2.D, ESS3.C, ESS3.D, ETS1.B, ETS2.B, CCC2, CCC7, SEP1, SEP7

**Brenda Bergman** (@MTU\_MiSTAR) and **Stephanie Tubman** (@MTU\_MiSTAR; *sctubman@mtu.edu*), Michigan Technological University, Houghton

Discover methods for scaffolding argumentation in a way that enhances student engagement and learning. Engage with tested tools from an NGSS-focused unit that addresses global climate change.

**Long-Term Ecology Data Collection and Analysis Using Ecocolumns**

(Grades 11–12) *West Hall B-5, Convention Center*  
 Science Focus: LS2, CCC2, CCC5, SEP2, SEP3, SEP4

**Kristi Schertz** (@SchertzSHS; *kristischertz@gmail.com*), Saugus High School, Saugus, Calif.

Students love ecocolumns! Learn how students can build them out of plastic bottles, discover a myriad of complex ecological interactions, collect data, and analyze data in environmental science (AP/Reg) or biology.

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**11:00 AM–12:30 PM Presentation**

**High School Hands-On Hodge-Podge Share-a-Thon**

(Grades 7–College) 152, Convention Center

Science Focus: GEN, INF, SEP

**Carrie Jones** (*ncscienceteacher@yahoo.com*), Middle Creek High School, Apex, N.C.

**Rachel Zimmerman Brachman** (*rachel.zimmerman-brachman@jpl.nasa.gov*), NASA Jet Propulsion Laboratory, Pasadena, Calif.

**Alicia Conerly**, Hazlehurst (Miss.) City School District

**David Gundrum** (*gundrum@sgps.org*), St. Genevieve High School, Panorama City, Calif.

**Chung Sinn Khong** (*khongc@esuhsd.org*), Yerba Buena High School, San Jose, Calif.

**Nicole Kurtz** (*nkurtz@ldeo.columbia.edu*), Lamont-Doherty Earth Observatory, Palisades, N.Y.

**Cecilia McGowan**, Hazlehurst High School, Hazlehurst, Miss.

**Godwyn Morris** (*dazzlingdiscoveries@gmail.com*), Dazzling Discoveries, New York, N.Y.

**Cassy Smith**, Eagle's Landing High School, McDonough, GA

**Christopher Thomas**, National Institute of Neurological Disorders and Stroke, Bethesda, Md.

**David Vernot** (*dvernot@gmail.com*), Butler County Educational Service Center, Hamilton, Ohio

**Brenda Walsh** (*bwalsh@edenpr.org*), Eden Prairie High School, Eden Prairie, Minn.

**Margaret Whitaker** (*mwhitaker@mountstmary.org*), Mount St. Mary High School, Oklahoma City, Okla.

**Ellie Williamson** (*ellie.williamson@uasdc.org*), Urban Assembly School of Design and Construction, New York, N.Y.

Join us for a variety of ideas for different STEM subjects. Come see what you can learn!

**Evaluate Your Sessions Online!**

This year, we're giving away an 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 page 17 for details.)

**11:30 AM–12 Noon Presentations**

**An Online Science Methods Course: Successes and Challenges**

(College) Olympic 1, JW Marriott

Science Focus: GEN, NGSS

**Lori Fulton** (*fultonl@hawaii.edu*) and **Jon Yoshioka** (*jon-yoshi@hawaii.edu*), University of Hawaii at Manoa, Honolulu  
Online learning environments can be challenging in the sciences. We will explore successes and lessons learned in teaching a hybrid elementary science methods course.

**NGSS Three-Dimensional Learning: Using an Interactive Planning Matrix to Plan for Enhanced Learning**

(Grades 5–College) Plaza 3, JW Marriott

Science Focus: GEN, NGSS

**Raymond Francis** (*@RW\_Francis; franc1rw@cmich.edu*), Central Michigan University, Mount Pleasant

**Shelby Goward** (*@GowardScience*), Ashley (Mich.) Community Schools

Participate in activities to integrate NGSS three-dimensional learning into real-life learning activities through an integrated curriculum planning and organizing process.

**STEM for All: A Collaboration Between K–12 Public Schools and a College of Education**

(Grades K–8) 506, Convention Center

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

**Steven Azeka** (*sazeka@gmail.com*) and **Rita Sanchez** (*@MsFarfalla76; rds2133@tc.columbia.edu*), Teachers College, Columbia University, New York, N.Y.

**Alyssa Greenwood** (*@Greenwood622; agreenwood@ms217q.com*) and **Eleni Balalis** (*ebalalis@schools.nyc.gov*), J.H.S. 217 Robert A. Van Wyck, Jamaica, N.Y.

Uncover what collaboration looks like between multiple educational institutions to further K–12 STEM learning in schools.

**STEM Ahead**

(Grades 5–8) 513, Convention Center

Science Focus: GEN, NGSS

**Stephanie Sasseti**, The Out-of-Door Academy, Middle & Upper School, Sarasota, Fla.

Using the NGSS and STEM in your school on a daily basis without making an extra class is easy. I can show you how to incorporate both every day with every unit by rethinking how science teachers teach science. Let me show you how to take simple (yet complex) units and turn them into a richer, deeper unit revolving around STEM and core science concepts.

### Claim, Evidence, Reasoning: A Strategy for Simplifying Lab Report Writing

(Grades 6–12) *Kentia Hall N, Convention Center*  
Science Focus: GEN, SEP4, SEP7, SEP8

**Jill Ronstadt** ([jill.ronstadt@lhsoc.org](mailto:jill.ronstadt@lhsoc.org)), Orange Lutheran High School, Orange, Calif.

Hear how to use Claim, Evidence, Reasoning strategies to help your students write a better, easier-to-read, and easier-to-grade lab report.



### 12 Noon–1:30 PM Exhibitor Workshops Phenomena-Driven Lessons for the Middle School Classroom

(Grades 5–8) *153A, Convention Center*  
Science Focus: ETS

Sponsor: TCI

**Nathan Wellborne**, TCI, Mountain View, Calif.

In this hands-on workshop, we will conduct a Bring Science Alive! investigation that gets students engaged in explaining phenomena and solving problems like real-world scientists and engineers. Join TCI and leave with everything you need to implement phenomena-driven lessons in the science classroom.

### You've Got Some Nerve! Exploring Neuronal Communication

(Grades 9–College) *153B, Convention Center*  
Science Focus: ETS, LS1.A, LS1.D, CCC1, CCC2, CCC4, CCC6, SEP1, SEP2, SEP6

Sponsor: MSOE Center for BioMolecular Modeling

**Gina Vogt** ([vogt@msoe.edu](mailto:vogt@msoe.edu)), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Engage your students in exploring an organism's response to neuronal stimuli by modeling action potentials and neurotransmitter release. Incorporate NGSS performance expectations in the topic of structure and function by formulating answers to how drugs and toxins disturb neuronal signaling with 3D-printed models and additional physical representations. Handouts!

### Educating on the Wild Side with the U.S. Fish and Wildlife Service

(Grades 1–8) *303 AB, Convention Center*  
Science Focus: LS, CCC

Sponsor: U.S. Fish and Wildlife Service

**David Clark** ([david\\_r\\_clark@fws.gov](mailto:david_r_clark@fws.gov)), Billy Frank Jr. Nisqually National Wildlife Refuge, Olympia, Wash.

Join us to learn how the U.S. Fish and Wildlife Service can connect with your classroom to provide students with

meaningful opportunities to engage in three-dimensional learning that supports the NGSS. Both field experiences and in-class opportunities will be highlighted.

### Learn to Code with LEGO® MINDSTORMS® Education EV3

(Grades 5–12) *304C, Convention Center*  
Science Focus: ETS

Sponsor: LEGO Education

**Kelly Reddin**, LEGO Education, Billund, Jylland, Denmark

Learn how to teach your students “coding habits of mind,” which will lay the foundation for them to engage in more advanced programming. Complete hands-on lessons that leverage coding skills and are built around national standards. Not a programmer? No problem. By the end of this session, you will be eager to bring coding and robotics to your classroom.

### Chemistry with Vernier

(Grades 9–College) *402A, Convention Center*  
Science Focus: ETS2, PS1, PS3, PS4

Sponsor: Vernier Software & Technology

**Nüsret Hisim** ([info@vernier.com](mailto:info@vernier.com)), Vernier Software & Technology, Beaverton, Ore.

Use Vernier sensors to conduct chemistry experiments from our lab books in this engaging hands-on workshop. Collect and analyze data on LabQuest 2 and computers. See a demonstration of our new Go Direct wireless and USB sensors that connect directly to computers, Chromebooks, and mobile devices—no interface needed.

### Physics with Vernier

(Grades 9–College) 402B, Convention Center

Science Focus: ETS2, PS2, PS3, PS4

Sponsor: Vernier Software & Technology

**Frances Poody** ([info@vernier.com](mailto:info@vernier.com)), Vernier Software & Technology, Beaverton, Ore.

Use Vernier sensors to conduct physics experiments from our lab books in this engaging hands-on workshop. Collect and analyze data on LabQuest 2 and computers. See a demonstration of our new Go Direct wireless and USB sensors that connect directly to computers, Chromebooks, and mobile devices—no interface needed.

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

(Grades 5–8) 403A, Convention Center

Science Focus: ESS, LS, PS

Sponsor: Flinn Scientific, Inc.

**Janet Hoekenga** ([jhoekenga@flinnsci.com](mailto:jhoekenga@flinnsci.com)) and **Mike Marvel** ([mmarvel@flinnsci.com](mailto:mmarvel@flinnsci.com)), 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. Participants perform and observe experiments designed to capture the curiosity and engage the energy of adolescent students. Handouts for all activities.

### Awesome Activities for an NGSS Classroom (Bio and Earth/Space)

(Grades 9–12) 408B, Convention Center

Science Focus: ESS, LS

Sponsor: Houghton Mifflin Harcourt

**Damon Smerchek** ([damon.smerchek@hmhco.com](mailto:damon.smerchek@hmhco.com)) and **James Oliver**, Houghton Mifflin Harcourt, Boston, Mass.

NGSS is more than starting your lesson with an activity. This hands-on workshop using selected activities from the brand-new HMH Science Dimensions curriculum will teach you how an NGSS lesson is different than the usual ways science is taught. Come experience a fun and engaging blended learning approach.

### Using Maggots, Flies, and Flesh to Solve a Mystery!

(Grades 6–12)

511 AB, Convention Center

Science Focus: GEN

Sponsor: Texas Instruments

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

A decomposing corpse is found in a field. Four possible missing persons fit the description. But who is it? Using clues near the scene will help determine identity. Forensic anthropologist and director of the human ID lab of Colorado, Dr. Diane France helped to develop this free middle school and high school forensic science lesson.

### Add STEM to ANY Classroom Curriculum with RoboRobo Robotics for Grades K–8

(Grades K–8)

512, Convention Center

Science Focus: ETS

Sponsor: Kids2GLOW

**Andrea Overton** ([andrea.overton@gmail.com](mailto:andrea.overton@gmail.com)), STEM Launch, Thornton, Colo.

**Tracey Calderón** ([info@kids2glow.com](mailto:info@kids2glow.com)), STEM Magnet Lab School, Northglenn, Colo.

Turn a basic lesson plan into an amazing one with RoboRobo Robotics, an easy-to-learn robotics line that teaches basic programming, mechanical skills, critical thinking, and problem solving in a fun and creative way. Get hands-on experience with robots and programming, discuss how RoboRobo ties into the CCSS, and discover ways to add Problem-Based Learning challenges into your classroom to create lessons that will inspire students. Raffle for a free robotics kit.

### Convection Currents and Continental Drift

(Grades 6–8)

518, Convention Center

Science Focus: ESS2.A, CCC3, CCC4, CCC5, SEP2, SEP3, SEP4, SEP6

Sponsor: Lab-Aids, Inc.

**Donna Markey**, Vista Visions Academy, Vista, Calif.

What forces drive the major land masses of Earth via continental drift? We will investigate and model convection currents and how they relate to geological activity—a significant consideration when evaluating sites to store nuclear waste and the main issue supporting this unit developed by SEPUP.



**12:30–1:00 PM Presentations****Connecting CCSS ELA and NGSS Through Close Reading***(Grades 4–12)**Plaza 3, JW Marriott*

Science Focus: GEN, NGSS

**Bobbi Hansen** (*chansen@sandiego.edu*), University of San Diego, Calif.

Link NGSS with the CCSS ELA via “close reading” strategies requiring students to think critically by making claims and providing supporting evidence.

**Turning Classroom Scientists into Citizen Scientists: Connecting Citizen Science and Secondary Research with FrogWatch USA***(Grades 5–9)**506, Convention Center*

Science Focus: ESS3.C, LS2.A, LS2.C, CCC1, CCC2, CCC7

**Paloma Krakower** (*@wcseducation; pkrakower@wcs.org*) and **Megan Janke** (*mjanke@wcs.org*), Wildlife Conservation Society, Bronx, N.Y.

Engage your students in the field and in the classroom through real-world amphibian data collection and secondary research investigations with FrogWatch USA.

**Energy and Matter...Start with Student Thinking!***(Grades K–5)**Kentia Hall B, Convention Center*

Science Focus: PS1, PS3

**Elizabeth Barrett-Zahn** (*ezahn@nredlearn.org*), Columbus Elementary School, New Rochelle, N.Y.

Emphasis will be placed on learning progressions and student thinking for K–5 students as they develop understandings of conservation of matter through inquiry and creative expression.

**Integrating Science and Engineering Using the 5E Instructional Model***(Grades P–8)**Kentia Hall J, Convention Center*

Science Focus: ETS1, SEP1, SEP6

**Nicole Glen** (*nglen@bridgew.edu*), Bridgewater State University, Bridgewater, Mass.

See examples and learn how elementary teachers have connected science content to engineering during the “Elaborate” of the 5Es while including the Engineering Design Process.

**12:30–1:30 PM Featured Presentation****Reenvisioning STEM Education: Transcending Boundaries to Realize the Vision of Inclusion, Diversity, and Equity in STEM Fields***(General)**Theatre (411), Convention Center*

Science Focus: GEN

*Sponsored by Shell*

**Roni Ellington** (*roni.ellington@morgan.edu*), Founder, Transforming STEM Network and Associate Professor, Mathematics Education, and Coordinator, Graduate Programs in Mathematics and Science Education, Morgan State University, Baltimore, Md.

President: Therese Shanahan, Program Coordinator, NSTA Los Angeles National Conference, and University of California, Irvine

The goal of this talk is to present a framework for STEM education that will transform the ways in which we conceptualize the aims and goals of STEM education, which have implications for curriculum, instruction, and pedagogy across all STEM disciplines. Join Roni for a discussion on how current STEM educational practices are grounded in a view of STEM learning that ultimately undermines our collective goals of creating a more inclusive and diverse STEM pipeline and workforce. She will share an alternative view of STEM education and transformative instructional strategies that can support and realize true equity, inclusion, and diversity in STEM.

*Currently, Roni Ellington is an associate professor of Mathematics Education and the coordinator of the Graduate Programs in Mathematics and Science at Morgan State University in Baltimore, Maryland. Her research interests include understanding the experiences of high achieving mathematics students, STEM education, mathematics curriculum/instruction, and teacher professional development.*

*She is also the owner and president of the Transformation of STEM Network (Trans-STEM.net), an organization committed to promoting and advocating for diversity in STEM education and disciplines and developing, implementing, and evaluating STEM practices and programs that empower ALL students to excel and persist in STEM disciplines and careers.*

## 12:30–1:30 PM Presentations



### **NSTA Press® Session: *Be a Winner! A Science Teacher's Guide to Writing Successful Grant Proposals***

(Grades P–12) *Diamond Ballroom Salon 1, JW Marriott*  
Science Focus: GEN, SEP1

**Patty McGinnis** (@patty\_mcginnis; [pattymcginnis1@gmail.com](mailto:pattymcginnis1@gmail.com)), Arcola Intermediate School, Eagleville, Pa.

We will share insights from the NSTA Press book *Be a Winner! A Science Teacher's Guide to Writing Successful Grant Proposals*.

### **The Science Behind Advanced Coursework in High School**

(Grades 9–College) *Olympic 1, JW Marriott*  
Science Focus: GEN

**Philip Sadler** ([psadler@cfa.harvard.edu](mailto:psadler@cfa.harvard.edu)) and **Gerhard Sonnert** ([gsonnert@cfa.harvard.edu](mailto:gsonnert@cfa.harvard.edu)), Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass.

Review findings from several national studies measuring the impact of AP, IB, and other advanced coursework on STEM career interest and later performance in college science.

### **Equity, Leadership, and Change**

(General) *Platinum Ballroom Salon A, JW Marriott*  
Science Focus: GEN

**Gary Nakagiri** ([gnakagiri@gmail.com](mailto:gnakagiri@gmail.com)), Alameda County Office of Education, Hayward, Calif.

NSTA would like to use STEM to help close the “achievement gap.” Learn about the latest research data and experience some strategies for facilitating equity conversations and activities.

### **Standards-Based Grading Strategies and Solutions**

(Grades 6–College) *Platinum Ballroom Salon C, JW Marriott*  
Science Focus: GEN

**Elizabeth Savage** (@savageaggiesci; [esavage@bcahs.com](mailto:esavage@bcahs.com)) and **Craig Johnson** (@aggiescience; [cjohnson@bcahs.com](mailto:cjohnson@bcahs.com)), Bristol County Agricultural High School, Dighton, Mass.

Our whole science department has been using standards-based grading for three 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.

### **Update on the California Science Curriculum Framework**

(Grades P–12) *Platinum Ballroom Salon D, JW Marriott*  
Science Focus: GEN, NGSS

**Bryan Boyd** ([bboyd@cde.ca.gov](mailto:bboyd@cde.ca.gov)) and **Stephanie Gregson** ([sgregson@cde.ca.gov](mailto:sgregson@cde.ca.gov)), California Dept. of Education, Sacramento

Get details about the recently adopted *California Science Curriculum Framework*. Participants will be provided with an overview of the framework organization and content.

### **Addressing the Needs of a Classroom of Students with IEPs**

(Grades 9–12) *Platinum Ballroom Salon E, JW Marriott*  
Science Focus: GEN

**Borislav Bilash** ([bbilash@pascack.k12.nj.us](mailto:bbilash@pascack.k12.nj.us)), Pascack Valley High School, Hillsdale, N.J.

Find out how to use lessons on video, Project-Based Learning, and standards-based grading to address the needs of a classroom of students with Individualized Education Plans.

### **Learn Math and Science Through the Built Environment**

(Grades 4–11) *Platinum Ballroom Salon H, JW Marriott*  
Science Focus: GEN, NGSS

**Duane Stilwell** ([dstilwell157@yahoo.com](mailto:dstilwell157@yahoo.com)), Nyack (N.Y.) Public Schools

**David Erenberg**, Sleepy Hollow High School, Sleepy Hollow, N.Y.

Use the built environment to teach STEAM principles. Through hands-on activities, students will never look at skyscrapers or bridges in quite the same way again.

### **STEM X Academy: Turning Inspiration to Classroom Innovation**

(Grades 3–10) *Platinum Ballroom Salon I, JW Marriott*  
Science Focus: GEN

**Vic Dobos** (@ASTA\_CEO; [ceo@asta.edu.au](mailto:ceo@asta.edu.au)), Australian Science Teachers Association, Canberra

STEM X Academy offers teacher learning with significant connection to both their professional needs and the world at large and it fosters an enacted approach to learning through the process of co-design.

### The Big Bang in the Classroom: An NGSS Story Line and Evidence-Based Reasoning

(Grades 5–12) *Platinum Ballroom Salon J, JW Marriott*  
Science Focus: ESS1.A, CCC5, SEP6, SEP7

**Ota Lutz** (*ota.l.lutz@jpl.nasa.gov*), NASA Jet Propulsion Laboratory, Pasadena, Calif.

Explore the evidence for the Big Bang, its place in the NGSS, and learn how to identify and respond to common objections and misconceptions.

### DISSECT: DIScover SciEnce through Computational Thinking

(Grades 6–12) *501C, Convention Center*  
Science Focus: GEN, SEP5

**Raena Cota** (*raenac@nmsu.edu*), New Mexico State University, Las Cruces

Computational methods are central to virtually any scientific discipline, and can be integrated into a STEM curriculum as a problem-solving tool.



### Engaging All Learners in Inquiry Through a Model of Shared Language

(Grades K–6) *502A, Convention Center*  
Science Focus: GEN

**Kate Baird** (*katebaird1430@gmail.com*), Indiana University–Purdue University Columbus

**Stephanie Coy** (*stephanie.coy@mnp.org*), Inglewood Elementary School, Nashville, Tenn.

Join us as we share a tested instructional model that brings together the 5Es and 5Rs for supporting language acquisition during inquiry.

### Science Fair 101: A Beginner's Guide to Creating a Fabulous Science Fair!

(Grades 6–8) *504, Convention Center*  
Science Focus: GEN

**Sandra Sullivan** (*sullivans401@aol.com*) and **Sarah Chapin** (*sarah\_chapin@yahoo.com*), Matthew J. Kuss Middle School, Fall River, Mass.

Science Fair 101 will cover everything from kids forming their own authentic questions to the care and feeding of judges (and where to find them).

### Using SMILE to Facilitate Student-Generated Questioning Practices in Science Classrooms

(Grades 3–9) *505, Convention Center*  
Science Focus: GEN, NGSS

**Hui-Yin Hsu** (*hhsu02@nyit.edu*), New York Institute of Technology, Old Westbury

Join us as we demonstrate integration of SMILE (Stanford Mobile Inquiry-Based Learning Environment) to facilitate students' critical-thinking skills and inquiry-based learning through students' question generation practices.

### The Shell Science Teaching Award: Fueling Success with Students

(Grades K–12) *507, Convention Center*  
Science Focus: GEN

**Gary Koppelman** (*gkoppelm@blissfieldschools.us*), Blissfield Elementary School, Blissfield, Mich.

Share your passion and practice by applying for this \$10,000 award. Learn from Shell awardees, finalists, and judging panel members.

### “We Already Learned This!” Incorporating NGSS in Middle Learning Progressions

(Grades 6–8) *514, Convention Center*  
Science Focus: GEN, NGSS

**Laura Rossier** (*rossierlj@gmail.com*), F.A. Day Middle School, Newtonville, Mass.

President: Jennifer Craddock, Newton (Mass.) Public Schools  
We will present protocols to help middle school teachers create distinct learning progressions throughout middle school science. Eliminate redundancy and unnecessary repetition while emphasizing scaffolded reteaching and expanding on prior knowledge. Methods may be used when creating your own curriculum or to modify curriculum “kits.”



### Engaging Multilingual Students and Their Families in STEM

(General) *515B, Convention Center*  
Science Focus: GEN, INF



**Yeni Violeta Garcia** (*@DrVioletaGarcia; violeta@stem-learningbydesign.com*), STEM Learning By Design, Denver, Colo.

STEM careers provide opportunities for students to enter lucrative fields and to solve important problems in our world, yet less than 8% of all STEM degrees are attained by Latinos. Learn about current STEM initiatives advancing students historically underrepresented in these fields.

**AREN: Doing Team-Based Field Investigations with a GLOBE Earth Science Partner**

(Grades 6–12) *Kentia Hall P, Convention Center*

Science Focus: ESS2, ESS3, SEP

**David Bydlowski** (@k12science; davidbydlowski@me.com), Wayne RESA, Wayne, Mich.

Build understanding in Earth science and engineering practices through the GLOBE Program and NASA's AREN AEROKATS (kites) and ROVERS (remote control boats) Education Network.

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**Earthquakes—From Paper to ArcGIS**

(Grades 9–12)

*West Hall B-5, Convention Center*

Science Focus: ESS2.B, ESS3.B, CCC1, CCC4, SEP2, SEP4, SEP7

**Mary Shane** (shanema@nv.ccsd.net), Advanced Technologies Academy, Las Vegas, NV

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

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**12:30–1:30 PM Hands-On Workshops**

**Mighty *Phragmites*: A Collaborative University/K–5 iSTEAM Ecosystem PBL Project**

(Grades K–5, College) *Diamond Ballroom Salon 2, JW Marriott*

Science Focus: ETS1, LS2, CCC, SEP

**Beth Topinka** (@btopink; topinkab@millstone.k12.nj.us), Millstone Township (N.J.) School District

**Claire Gallagher** (@gooderg; cgallagher@georgian.edu), Georgian Court University, Lakewood, N.J.

Bring an authentic geographical and ecological context to your classroom. We will share a university/K–5 iSTEAM Problem-Based Learning collaboration where students use NGSS 3D strategies to investigate, identify, and solve problems related to the invasive species *Phragmites australis*.

and the resulting recommendations for creating a classroom culture where students lead discussions using productive talk strategies.

**Introduction to POGIL**

(Grades 7–12)

*Diamond Ballroom Salon 7, JW Marriott*

Science Focus: GEN, SEP2, SEP4, SEP6, SEP8

**Kathleen Dwyer**, MRH High School, Maplewood, Mo.

Heard about POGIL but don't know how it works? Experience student perspective of these research-based lessons that foster participation by all students.

**Engineer Your Own Paper Microscope**

(Grades 6–12)

*Diamond Ballroom Salon 8, JW Marriott*

Science Focus: LS, PS, CCC, SEP

**Kirk Brown** (@SJCOESTEM; @KQEDscience; kbrown@sjcoe.net), San Joaquin County Office of Education, Stockton, Calif.

**Andrea Aust** (@KQEDAust; aaust@kqed.org), KQED, San Francisco, Calif.

Experience how engineering fits into three-dimensional learning through a sequence that targets both life science and physical science goals while designing a microscope.

**Engineering Practices in the Life Sciences**

(Grades 6–12)

*Diamond Ballroom Salon 9, JW Marriott*

Science Focus: ETS, LS, SEP

**Brooke Whitworth** (@bawhit41; brooke.whitworth@nau.edu), Northern Arizona University, Flagstaff

**Jennifer Maeng**, University of Virginia, Charlottesville

**Amy Hutter** (ahutter@peoriaud.k12.az.us) and **Judy Meredith** (jmeredit@pusd11.net), Peoria (Ariz.) Unified School District

Learn more about approaches to incorporate engineering practices into your life science lessons. Take home resources and handouts for all activities.



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

(Grades K–5) *Diamond Ballroom Salon 3, JW Marriott*

Science Focus: GEN, NGSS

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

The authors of this award-winning series from NSTA will model lessons that use picture books to connect NGSS and CCSS.

**Using Productive Talk in Middle School and High School Classes to Get the Most Out of Classroom Discussions**

(Grades 6–12) *Diamond Ballroom Salon 6, JW Marriott*

Science Focus: GEN, NGSS

**Beth Byerssmall** (@bbyerssmall; elizabeth.byerssmall@maine.edu) and **Marina Van der Eb** (marina.van@maine.edu), The Maine Center for Research in STEM Education (RiSE Center), Orono

**Rachel Martin** (rachel.a.martin@tamu.edu), Texas A&M University, College Station

Review research in middle school and high school classes

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6TH ANNUAL

**STEM**

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## Forum & Expo

HOSTED BY NSTA

Kissimmee/Orlando

July 12–14, 2017

This dynamic event brings together educators and organizations who are actively implementing STEM programs in their schools or districts.

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  
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**ASTC-Sponsored Session: Mobile MAIA Science Lab: Using Dinosaurs and Cattle to Engage in Science and Math Concepts**

(Grades 9–12) *Olympic 3, JW Marriott*  
Science Focus: ETS, LS, CCC1, CCC2, CCC3, CCC6, SEP  
**Nate Carroll** (@CarterCoMuseum; *ccmuseum@midrivers.com*) and **Sabre Moore** (@CCMEkalaka), Carter County Museum, Ekalaka, Mont.

Explore the mathematical and biologic concepts of growth curves in a hands-on lab. Using cattle and dinosaur femurs, students connect STEM to agriculture and fossils.

**The Game Is Afoot! Holmes, Literacy, and NGSS in the Secondary Physical Science Classroom**

(Grades 9–11) *Platinum Ballroom Salon B, JW Marriott*  
Science Focus: PS

**Vito Dipinto** (*vdipinto@nl.edu*), National Louis University at Wheeling, Ill.

**Andrew Bean** (*apbean@cps.edu*), Dever Elementary School, Chicago, Ill.

Let us be your guide on how to use two new Sherlock Holmes stories to integrate science and literacy in the secondary physical science classroom.

**Providing Equitable Learning Experiences for ELLs in Science**

(Grades 6–12) *Platinum Ballroom Salon F, JW Marriott*  
Science Focus: GEN, NGSS

**Jaclyn Austin** (@jaclyn\_austin; *jaclyn\_austin@hcpss.org*), **Deborah Puhak** (*deborah\_puhak@hcpss.org*), and **Jessica Mulhern** (@JMulhernBiology; *jessica.mulhern@hcpss.org*), Howard County Public School System, Ellicott City, Md.

**Mary Weller** (@HoCoSecScience; *mary\_weller@hcpss.org*), NSTA Director, District III, and Howard County Public School System, Ellicott City, Md.

Explore 3-D learning focusing on equitable access for English language learners. Personalized supports within the same learning experience will be modeled and shared.

**Putting the “T” in STEM: Integrating Computing into STEM Learning for Middle School Girls**

(Grades 5–8, College) *Platinum Ballroom Salon G, JW Marriott*  
Science Focus: ETS, CCC, SEP

**Sarah Carter** (*scarter@tpt.org*), **Rita Karl** (@SciGirls; *rkarl@tpt.org*), and **Leah Defenbaugh** (@leahdeeda; *ldefenbaugh@tpt.org*), Twin Cities Public Television, Saint Paul, Minn.

Discover how to integrate three applications of computing (e-textiles/wearables, robotics, and geospatial technologies)

into STEM programs using computational thinking, connected learning, and the NGSS.

**NGSS NGSS 3D Implementation: Tools for Middle School and High School Teachers**

(Grades 6–12) *515A, Convention Center*  
Science Focus: GEN, NGSS

**Ana Houseal** (*ahouseal@uwyo.edu*), University of Wyoming, Laramie

Explore three-dimensional learning using tools developed to help secondary teachers design their curriculum and teaching strategies. Handouts!



**NSTA Press® Session: Bringing the S-T-E-M Together in Early Childhood Using Science and Engineering Practices**

(Grades P–2) *Kentia Hall D, Convention Center*  
Science Focus: GEN, SEP

**Peggy Ashbrook**, NSTA Early Years Columnist, Alexandria, Va.

Increase your understanding of science and engineering practices while seeing how young children use them in STEM explorations. Discuss examples and NSTA’s early childhood position statement.

**Use of Existing NASA STEM Lessons to Support NGSS Engineering Practices**

(Grades P–5) *Kentia Hall E, Convention Center*  
Science Focus: GEN, SEP

**Arthur Bowman**, Norfolk State University, Norfolk, Va. The use of existing NASA STEM lessons to teach the NGSS engineering practices will be the focus of this hands-on session. In addition, other science topics will be considered.

**Using Biomimicry in the Early Grades: Meeting NGSS Practices**

(Grades 1–3) *Kentia Hall F, Convention Center*  
Science Focus: LS1

**William Sumrall** (*sumrall@olemiss.edu*), The University of Mississippi, University, Miss.

Using the learning cycle camouflage/seed dispersal activities, engage your students in developing an understanding of biomimicry. We will cover additional ideas for introducing biomimicry in the early grades.

**Ecosystems: Where Should I Live?***(Grades 1–6)* Kentia Hall G, Convention Center

Science Focus: LS2, SEP2, SEP8

**Maria Elizondo** (*mpare4@lausd.net*), **Albert Rodela** (*albert.rodela@lausd.net*), and **Lillian Valadez-Rodela** (*lillian.valadez-rodela@lausd.net*), Los Angeles (Calif.) Unified School District**Paulette Donald** (*pgd2217@lausd.net*), Crescent Heights Language Arts Social Justice Magnet School, Los Angeles, Calif.

Explore best practices to implement equitable learning opportunities for all learners to engage in activities on ecosystems.

**School Science Partnerships: How the Peggy Notebaert Nature Museum Builds a Schoolwide Understanding of NGSS***(Grades K–8)* Kentia Hall H, Convention Center

Science Focus: GEN, NGSS

**Stephanie Sidaway**, Peggy Notebaert Nature Museum, Chicago, Ill.

Experience a snapshot of our schoolwide professional development by engaging in performance expectation mapping to develop a yearlong scope and sequence.

**Composing Science: A Facilitator's Guide to Writing in the Inquiry Classroom***(Grades 2–College)* Kentia Hall K, Convention Center

Science Focus: PS4.B, CCC2, CCC4, SEP

**Irene Salter** (*irene@chrysalischarter.org*), Chrysalis Charter School, Palo Cedro, Calif.

Through playing with lenses and examples from our classes, learn concrete strategies that encourage your students to use writing the way scientists do.

**Do You See What I See?***(Grades 6–College)* Kentia Hall L, Convention Center

Science Focus: LS, SEP2, SEP4, SEP6, SEP7, SEP8

**James Clark**, San Lorenzo (Calif.) Unified School District  
**Samantha Johnson** (*@sci\_innovations; smjohnson@slzsd.org*), Arroyo High School, San Lorenzo, Calif.

We will demonstrate how students can use modeling and data analysis to show their knowledge of various concepts in biology. Take home a goody bag and ready-made lesson plans that can be used immediately.

**Slingshot Physics***(Grades 9–12)* Kentia Hall O, Convention Center

Science Focus: PS3.A, PS3.C, CCC5, SEP2, SEP4, SEP5

**Aaron Osowiecki** (*aosowiecki@bostonpublicschools.org*), Boston Latin School, Boston, Mass.

Assess your students' understanding of work, energy, friction, and Newton's First Law of Motion using an inexpensive rubber band slingshot.

**Photosynthesis: An Integrated, Hands-On Approach Supporting the NGSS and CCSS ELA***(Grades 6–12)* Kentia Hall R, Convention Center

Science Focus: LS1, CCC5, SEP2, SEP8

**Laura Robertson** (*robertle@etsu.edu*), East Tennessee State University, Johnson City

We will combine hands-on science investigations with supporting literacy activities to help students build conceptual models of photosynthesis.

**NESTA Geology Share-a-Thon***(Grades 6–College)* Petree Hall D, Convention Center

Science Focus: ESS, ETS2

**Michael Passow** (*michael@earth2class.org*), Dwight Morrow High School, Englewood, N.J.**Belinda Jacobs** (*bjrockgirl11@gmail.com*), Cedar Ridge High School, Round Rock, Tex.

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

**CESI-Sponsored Session: Combining Science with Art to Understand How We See Color—Using Negative Art for a Positive Effect***(Grades P–8)* West Hall B-2, Convention Center

Science Focus: ETS2, LS1.A, LS1.D, PS2, PS4, CCC1, CCC2, CCC6, SEP1, SEP2, SEP3, SEP4

**Mark Malone** (*mmalone@uccs.edu*), University of Colorado at Colorado Springs

Explore retinal fatigue to discover color opposites and the additive and subtractive nature color. Apply the physics of color to create negative images that can only be correctly viewed virtually.



—Photo courtesy of Mike Weiss

### Keepin' It Real: How to Plan Three-Dimensional Lessons That Hook Students on Real Problems

(Grades 6–8) *West Hall B-3, Convention Center*

Science Focus: GEN, NGSS

**Stephanie Tubman** (@MTU\_MiSTAR; *sctubman@mtu.edu*), **Brenda Bergman**, and **Tony Matthys**, Michigan Technological University, Houghton

**Robin Allen** (*allenrj@midlandps.org*), Northeast Middle School, Midland, Mich.

**Dawn Kahler** (*kahlerdm@kalamazoo.k12.mi.us*), Milwood Magnet School, Kalamazoo, Mich.

Experience a hands-on lesson using a comprehensive instructional model to spark creation of your own lessons that hook students on the three dimensions of NGSS.

### Why Does Our Whole Neighborhood Smell Like Grandma's Cookies Fresh Out of the Oven? Developing and Using Models to Explain Interesting Phenomena

(Grades 6–8) *West Hall B-4, Convention Center*

Science Focus: GEN, SEP2

**Alissa Berg** (@alissabberg; *alissaberg@gmail.com*), Academy for Urban School Leadership (AUSL), Chicago, Ill.

**Alexa Freshour** (@alexafreshour; *alexayoung.ausl@gmail.com*), Marquette Elementary School, Chicago, Ill.

Modeling is at the center of the scientific enterprise. Explore how modeling is the glue for NGSS-focused units of instruction.

## 12:30–2:30 PM Presentations

### Multicultural/Equity Share-a-Thon

(General) *Gold Ballroom Salon 3, JW Marriott*

Science Focus: GEN, NGSS

**Jerry Valadez** (@cswnet; *jdvsience@yahoo.com*), NSTA Director, Multicultural/Equity in Science Education, and SAM Academy, Inc., Sanger, Calif.

**Olukayode Banmeke** (@kaybanms; *kaybanms20014u@yahoo.com*), DuVal High School, Lanham, Md.

**Meg Delgato** (*delgato.meg@spscollege.edu*), St. Petersburg College, Redington Shores, Fla.

**Marion Reeves**, Science Education Consultant, Avondale Estates, Ga.

**Sami Kahn** (*kahns@ohio.edu*), Ohio University, Athens, Ohio

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

**Juliana Texley** (@JulianaTexley; *texle1j@cmich.edu*), 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant, Mich.

Come to the Multicultural/Equity in Science Education Share-a-Thon and learn about current research and successful programs on closing the achievement gap.

### INF Science in the Community Session: Using Informal Science Experiences to Explore Environmental Issues

(General) *151, Convention Center*

Science Focus: ESS2, INF, SEP3, SEP4, SEP6

**Joy Kubarek**, PEER Associates, Richmond, Vt.

**Sara Kobilka** (@SaraKDM; *sara.skell@gmail.com*), The University of Arizona STEM Learning Center, Tucson

**Tamara Zeller** (*tamara\_zeller@fws.gov*), U.S. Fish and Wildlife Service, Div. of Migratory Bird Management, Anchorage, Alaska

**Lindsay Glasner** (@BirdSleuth; *lig27@cornell.edu*), The Cornell Lab of Ornithology, Ithaca, N.Y.

**David Clark** (*david\_r\_clark@fws.gov*), Billy Frank Jr. Nisqually National Wildlife Refuge, Olympia, Wash.

**Alyssa Firkus** (@SheddLearning; *afirkus@sheddaquarium.org*), Shedd Aquarium, Chicago, Ill.

Science is all around us and this forum shares how teachers and students can connect with informal settings to use science to explore environmental issues in unique ways.



**1:00–1:30 PM Presentations****Teaching Vivid Vocabulary in Your Science Classroom***(Grades 3–College)**Plaza 3, JW Marriott*

Science Focus: GEN

**Karen DiBella** (@ksdibella; [kdibella@utm.edu](mailto:kdibella@utm.edu)) and **Kimberly Williams** ([kwil1126@utm.edu](mailto:kwil1126@utm.edu)), The University of Tennessee at Martin

Engage students in academic vocabulary and deepen their content knowledge. Experience this hands-on approach to vocabulary and find strategies to immediately integrate into instruction.

**Plant Invaders! An Interactive Game Exploring Invasive and Native Plants of California***(Grades 4–8)**506, Convention Center*

Science Focus: ESS3.C, LS2, LS4.B, LS4.C, CCC2, CCC4, SEP2, SEP5

**Emily Walter**, California State University, Fresno

Explore an invasive species game with “trading cards” of native and invasive California plants. Includes directions for how to modify the game for any state!

**Girls Just Want to Do STEM***(Grades 5–8)**513, Convention Center*

Science Focus: GEN

**Brandy Whitney** ([whitneybrandy@yahoo.com](mailto:whitneybrandy@yahoo.com)), Ottoson Middle School, Arlington, Mass.

A slow and steady revolution to change the face of STEM fields is underway. Come learn how girls really can love STEM when it relates to real-world problems.

**Save the Monarchs: A Fifth-Grade Yearlong Unit on Monarch Butterflies***(Grades 3–6)**Kentia Hall B, Convention Center*

Science Focus: LS

**Melissa Morey**, Roosevelt STEAM Academy, Elkhart, Ind. Find out how a group of grade 5 teachers created a yearlong unit focused on monarch butterflies and the preservation of the species.

**How to Implement Technology into Your Inquiry-Based Science Classroom***(Grades 4–8)**Kentia Hall J, Convention Center*

Science Focus: ETS

**Allison Bogart** (@AllieBBogart; [bogarta@bcisd.com](mailto:bogarta@bcisd.com)), Paul Cato Middle School, Bakersfield, Calif.

Learn how to integrate students’ use of technology into an inquiry-based science classroom.

**1:00–2:00 PM Meeting****NSTA Standing Committee, Advisory Board, and Panel Chairs Meeting***(By Invitation Only)**Olympic 2, JW Marriott***2:00–2:30 PM Presentations****How to Engage Middle School Students in Evidence-Based Argumentation***(Grades 6–9)**514, Convention Center*

Science Focus: GEN, SEP7

**Katherine Hohman** ([khohman@portchesterschools.org](mailto:khohman@portchesterschools.org)), Teacher, Port Chester, N.Y.

Students love to argue. Find out how to harness that passion so students can create written scientific arguments based on evidence.

**Science Without Literacy = A Beaker Half Empty***(Grades 1–5)**Kentia Hall B, Convention Center*

Science Focus: GEN

**Karen DiBella** (@ksdibella; [kdibella@utm.edu](mailto:kdibella@utm.edu)), The University of Tennessee at Martin

Transform your elementary science classroom into a cross-curricular phenomenon while implementing the 5E (Engage, Explore, Explain, Elaborate, and Evaluate) instructional model. Engage in an interactive study relating to surf and sand through the integration of scientific inquiry and applicable literacy skills.

**INF Helping Girls See Themselves as Capable Engineers***(Grades 4–8)**Kentia Hall J, Convention Center*

Science Focus: ETS1, ETS2.B, INF

**Sarah Hug** ([hug@colorado.edu](mailto:hug@colorado.edu)), University of Colorado Boulder

**Suzanne Eyerman**, Fairhaven Research and Evaluation, Denver, Colo.

Hear how one informal science education program has designed and implemented an engineering after-school program aimed at increasing the participation of girls in STEM. Specifically, we will present research-based evidence of the ways Techbridge (STEM nonprofit in Oakland, Seattle, and D.C.) has supported the development of scientific agency.

**Evaluate Modeling Chemistry with EQuIP***(Grades 9–11)**Kentia Hall O, Convention Center*

Science Focus: PS

**Yi Li** ([y12857@tc.columbia.edu](mailto:y12857@tc.columbia.edu)), Teachers College, Columbia University, New York, N.Y.

Come learn how we map the Modeling Chemistry with NGSS and use EQuIP to measure the alignment. The lesson we learn from the process will also be presented.

**2:00–3:00 PM NSTA/ASE Honors Lecture**  
**The Climate for Science Practical Work in UK Schools**

(General) 506, Convention Center  
Science Focus: GEN

*Sponsored by The Association for Science Education (ASE)*



**Chris Colclough** (*cpcsms@[dial.pipex.com](mailto:dial.pipex.com)*), 2016–2017 Chair, The Association for Science Education, Hatfield, Herts., UK

President: Shaun Reason, Chief Executive, The Association for

Science Education, Hatfield, Herts., UK

Practical work is at the foundation of science. Investigative and inquiry work is what makes the study of science unique and is integral to effective science teaching and learning. With a packed science curriculum, teachers have always been challenged to integrate appropriate practical work in their lessons as they develop the science knowledge and understanding of their students. Along with the many changes to the curriculum at both Primary (4–11 years) and Secondary (11–19 years) levels in the United Kingdom, there have been significant changes to assessment, including the assessment of practical work. Join Chris as she outlines key features in which ASE has been active in supporting the development of guidance on effective practical work and its assessment.

*The Association for Science Education (ASE) is the largest subject organization in the United Kingdom and as such is a unique family providing support in all things linked to science education. Chris Colclough has shared her expertise and enthusiasm for science education by presenting at local, regional, and national conferences in the UK and was deservedly elected by members to be the chair of the Association during the 2016–17 academic year.*

*Chris' mission as ASE Chair is to promote the right of all science teachers to subject-specific professional development. The ASE provides many opportunities for members to engage with current issues that affect them professionally.*

*Prior to her ASE Chair, she was director of Science and Applied Learning from 2009 in Sunderland and in 2014 retired from schools as assistant principal. She has taught in four Secondary schools (equivalent to U.S. grades 6–12) in the City of Sunderland in North East England before becoming head of biology and then head of science in 1997. In 2008, she achieved Chartered Science Teacher (CSciTeach) status, which recognizes her excellence in science teaching and learning. She holds degrees in microbiology and biochemistry from the University of Dundee, Scotland.*

**2:00–3:00 PM Presentations**  
**Technology in the Science Classroom**

(General) Diamond Ballroom Salon 10, JW Marriott  
Science Focus: GEN, CCC

**Kristen Kohli** (*@kohliscience*; *kristen@wakingdream.net*), Estrella Foothills High School, Goodyear, Ariz.

Technical Advisory Board members will share best practices in technology, including engagement, collaboration, and assessment in support of the new NSTA position statement on technology.

**Close Reading Practices for the NGSS Notebook**

(Grades 6–12) Gold Ballroom Salon 2, JW Marriott  
Science Focus: GEN, NGSS

**Henri Shimojo** (*henri.shimojo@ucr.edu*), University of California, Riverside

**Yamileth Shimojo** (*yshimojo@rcoe.us*), Riverside County Office of Education, Murrieta Office, Murrieta, Calif.

Leave with connections to the NGSS and pedagogical strategies of Cornell note-taking and close reading as evidence in science notebooks.

**Developing the Postulates of Special Relativity in Group Discussions**

(Grades 10–12) Olympic 1, JW Marriott  
Science Focus: PS4.A, SEP1, SEP2

**Muhammad Ali Yousuf** (*@M\_Ali\_Yousuf*; *mali@jhu.edu*), Johns Hopkins Center for Talented Youth, Baltimore, Md.

**Igor Woiciechowski** (*woiciechowski@ab.edu*), Alderson Broaddus College, Philippi, W.Va.

Learn to motivate students through thinking and discussions to come up with an understanding of Einstein in the context of early 19th-century science.

**The Top 10 Safety Issues in the Science Classroom/Laboratory You Need to Know!**

(General) Platinum Ballroom Salon A, JW Marriott  
Science Focus: GEN

**Mary Loesing** (*@MLoesing*; *mloesing@ccsdl.org*), NSTA Director, District IV, and Connetquot Central School District, Bohemia, N.Y.

**Edward McGrath** (*@eddiesciguy*; *edward.mcgrath@redclay.k12.de.us*), Red Clay Consolidated School District, Wilmington, Del.

Every science teacher wants their students to be engaged in a safer working/learning environment. Members of the NSTA Safety Advisory Board will discuss important issues in lab safety such as occupancy loads, chemical storage and disposal, field trip safety, and duty of care.

**INF STEAM Festivals: Improving Your Science Fair***(Grades 1–12) Platinum Ballroom Salon C, JW Marriott*

Science Focus: GEN, INF

**Anne Artz** (@anneartz; [aartz@ucsd.edu](mailto:aartz@ucsd.edu)) and **Shaoni Bandy** ([sbandy@ucsd.edu](mailto:sbandy@ucsd.edu)), The Preuss School UCSD, La Jolla, Calif.

Learn how to expand student and family involvement in STEAM with practical ideas for all grade levels to incorporate into an engaging science, technology, engineering, art, and math festival.

**A Peek at PEEC: Evaluating Instructional Materials for NGSS***(General) Platinum Ballroom Salon E, JW Marriott*

Science Focus: GEN, NGSS

**Matthew Krehbiel** ([mkrehbiel@achieve.org](mailto:mkrehbiel@achieve.org)), Achieve, Inc., Washington, D.C.

PEEC is a tool that builds on the EQUiP rubric for science to evaluate the degree to which a curriculum or a textbook is really designed for the NGSS. Join me for a quick overview of how the tool works and highlights on NGSS innovations that should be apparent in instructional materials designed for the NGSS. If you or your district will be selecting new textbooks soon, you'll want to learn more about this tool.

**Using Climate Science and Mathematics to Engage All Learners***(Grades 3–12) Platinum Ballroom Salon F, JW Marriott*

Science Focus: ESS2.D, ESS3, ETS

**Dennis Pevey**, eStem Elementary Public Charter School, Little Rock, Ark.**Teri Cox** (@Tericox1; [teri.cox@estemlr.net](mailto:teri.cox@estemlr.net)), eStem Middle Public Charter School, Little Rock, Ark.

Explore connections between climate science and math. Get practical tools for meeting the needs of diverse learners from SPED to gifted, English language learners, and economically disadvantaged.

**Femineers: A Model for Attracting and Retaining Girls in STEM***(Grades 6–College) Platinum Ballroom Salon H, JW Marriott*

Science Focus: GEN

**Mariappan Jawaharlal** ([jmariappan@cpp.edu](mailto:jmariappan@cpp.edu)) and **Nicole Gutzke** ([nmgutzke@cpp.edu](mailto:nmgutzke@cpp.edu)), Cal Poly Pomona, Calif.

Cal Poly Pomona has created a unique and innovative three-year program to inspire and empower K–12 female students to pursue STEM majors and careers.

**Building Very Long-Term Concept Retention***(General) Platinum Ballroom Salon I, JW Marriott*

Science Focus: LS1.D

**Michael Bechtel** ([michael.becht@wartburg.edu](mailto:michael.becht@wartburg.edu)), Wartburg College, Waverly, Iowa

Let's take a look at the historical, ground-breaking work of Ebbinghaus and Ogden and how their findings are integral in today's science classroom.

**Productive Academic Talk as a Foundation for Arguing from Evidence***(Grades 3–12) Platinum Ballroom Salon J, JW Marriott*

Science Focus: GEN, SEP6, SEP7, SEP8

**Linda Tolladay** (@LindaTolladay; [lindatolladay@maderausd.org](mailto:lindatolladay@maderausd.org)), Madera (Calif.) Unified School District

Come experience how to initiate rigorous academic talk from day one! You will leave with practical suggestions to use immediately in your classroom, school, or district.

**Engaging High School Students in Reading and Writing to Support Science Practice Proficiency***(Grades 9–12) Plaza 1, JW Marriott*

Science Focus: GEN, SEP

**Michael Lim** (@courageousgiver; [michael.lim@lausd.net](mailto:michael.lim@lausd.net)) and **Kelley Vineyard** ([kelley.vineyard@lausd.net](mailto:kelley.vineyard@lausd.net)), South Gate High School, South Gate, Calif.**Angela Kolonich** (@akolonich; [gerberan@msu.edu](mailto:gerberan@msu.edu)), Michigan State University, East Lansing

Engage in activities and discussions for use with students that advance understanding of the science practices through reading and writing.

**STEM Share-a-Thon***(Grades 6–12) 152, Convention Center*

Science Focus: GEN, SEP

**Shannon Sahabi** ([shannon.sahabi@nisd.net](mailto:shannon.sahabi@nisd.net)), Tom C. Clark High School, San Antonio, Tex.**Brian Soash** ([briansoash@yahoo.com](mailto:briansoash@yahoo.com)), Lee County Middle School West Campus, Leesburg, Ga.**Steven Sogo** ([ssogo@lbusd.org](mailto:ssogo@lbusd.org)), Laguna Beach High School, Laguna Beach, Calif.**Amanda Upton**, Manager, Nominations and Teacher Awards Programs, NSTA, Arlington, Va.

Presider: Sheila Smith, Science Consultant, Ridgeland, Miss. 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.

### Science in the City and Around the Globe

(Grades 7–12) 501C, Convention Center

Science Focus: GEN

**Kimberly Godfrey** ([kag379@drexel.edu](mailto:kag379@drexel.edu)) and **Betsy Payne** ([payne@ansp.org](mailto:payne@ansp.org)), The Academy of Natural Sciences of Drexel University, Philadelphia, Pa.

Explore ways to expose young women to real-life science applications in the city and around the world through hands-on experiences and other unique opportunities.



### How and Why STEM Career Interest Changes in High School

(Grades 9–College) 502B, Convention Center

Science Focus: GEN

**Philip Sadler** ([psadler@cfa.harvard.edu](mailto:psadler@cfa.harvard.edu)) and **Gerhard Sonnert** ([gsonnert@cfa.harvard.edu](mailto:gsonnert@cfa.harvard.edu)), Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass.

We 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.

### STEM Road Map, 6–8: Integrated STEM Teaching in Middle School

(Grades 6–8) 504, Convention Center

Science Focus: ESS3, CCC, SEP

**Erin Peters-Burton** ([epeters1@gmu.edu](mailto:epeters1@gmu.edu)), George Mason University, Fairfax, Va.

**Carla Johnson** ([@drclarlaj](mailto:@drclarlaj); [carlacjohnson@purdue.edu](mailto:carlacjohnson@purdue.edu)) and **Janet Walton**, Purdue University, West Lafayette, Ind.

Receive an overview of the upcoming NSTA Press® curriculum book series *STEM Road Map for Middle School* as we take a deep dive exploring one of the eight middle school modules: Amusement Parks of the Future.

### Starting a Makerspace? Best Practices, NGSS Integration, and Lessons Learned!

(Grades 1–8) 505, Convention Center

Science Focus: ETS, SEP

**Gabriele St. Martin** ([gabriele1114@yahoo.com](mailto:gabriele1114@yahoo.com)), The Benjamin School, North Palm Beach, Fla.

Learn about the extensive research done and yearlong journey starting a makerspace and effectively using such a space across the curriculum. Get great ideas for planning and implementing your own makerspace!

### Write for NSTA's Journals

(General) 507, Convention Center

Science Focus: GEN

**Ken Roberts** ([ken\\_r@nsta.org](mailto:ken_r@nsta.org)), Assistant Executive Director, Journals, NSTA, Arlington, Va.

Meet with the editorial staff of NSTA's award-winning journals to learn how to successfully prepare and submit an article for publication.



### How to Create a Network and Supply Chain to Support Collaborative Biotechnology Education

(Grades 9–College) 515B, Convention Center

Science Focus: LS, SEP

**Ying-Tsu Loh** ([yingsu@babec.org](mailto:yingsu@babec.org)), Bay Area Biotechnology Education Consortium, South San Francisco, Calif.

Get inspired by the Bay Area Biotechnology Education Consortium (BABEC) to work with your local community partners to share resources and increase access to the tools of science. I'll present a method for creating links between the biotechnology industry, postsecondary educational institutions, districts, and schools so that all students can be equipped with research-grade resources to engage in industry-relevant biotechnology investigations.

### Harvesting Equity: Seeds to Community

(Grades P–6) Kentia Hall A, Convention Center

Science Focus: LS, CCC1, CCC2, CCC4, CCC5, CCC6, CCC7, SEP

**Michelle Fleming** ([michelle.fleming@wright.edu](mailto:michelle.fleming@wright.edu)) and **Colleen Saxen** ([colleenqsaxen@gmail.com](mailto:colleenqsaxen@gmail.com)), Wright State University, Dayton, Ohio

**Dana Franks** ([dfranks@decaprep.org](mailto:dfranks@decaprep.org)), **Tyler Kerlin** ([tkerlin@daytonearlycollege.org](mailto:tkerlin@daytonearlycollege.org)), and **Sarah Kerlin** ([sarah.rodehaver@gmail.com](mailto:sarah.rodehaver@gmail.com)), DECA PREP, Dayton, Ohio

Have your students dig deeper into learning how and why plants grow. An outdoor learning garden engages students and their community in democratic practices. We will illustrate how we maximized student learning through cultural promotive interactions.

### Reading, Writing, and Science, Oh My!

(Grades K–8) Kentia Hall L, Convention Center

Science Focus: GEN

**Sally Creel** ([@STEMSally](mailto:@STEMSally); [sally.creel@cobbk12.org](mailto:sally.creel@cobbk12.org)), Cobb County School District, Marietta, Ga.

English language arts emphasizes informational reading and writing...well so does science! Learn how to easily integrate science and ELA standards. Concrete examples of strategies for predicting and inferring, vocabulary development, comprehension, summarization, activating prior knowledge, and assessing formatively will be demonstrated and shared.

**2:00–3:00 PM Hands-On Workshops****A Case of Unintentional Overdose**

(Grades 7–12) *Diamond Ballroom Salon 1, JW Marriott*  
Science Focus: LS, CCC2, SEP

**Dina Markowitz** (*dina\_markowitz@urmc.rochester.edu*) and **Danielle Alcena** (*danielle\_alcena@urmc.rochester.edu*), University of Rochester, N.Y.

**Lisa Brosnick** (*lbrosnick@gmail.com*), North Collins Central School, North Collins, N.Y.

Follow the case of a teen who has taken an unintentional overdose of over-the-counter (OTC) medicine. Conduct simulated lab tests, interpret drug facts labels, and learn how improper use of OTC medicines may cause serious health problems. Learn about free online resources from the University of Rochester’s “Medicines and Me” project.

**STEM Learning Through Cantilever Span Design and Construction**

(Grades P–12) *Diamond Ballroom Salon 2, JW Marriott*  
Science Focus: ETS1, PS2, SEP

**Lou Loftin** (*lloftin@washoeschools.net*) and **Brian Crosby** (*@bcrosby; bcrosby@washoeschools.net*), Nevada’s Northwest Regional Professional Development Program, Reno

**Kenneth Wesson** (*kenawesson@aol.com*), National Science Consultant, San Jose, Calif.

**Traci Loftin** (*tloftin@washoeschools.net*) and **Cari Potter** (*cpotter@washoeschools.net*), Washoe County School District, Reno, Nev.

**Amanda Gentry** (*amandaleighg@gmail.com*), Billingshurst Middle School, Reno, Nev.

Presenter: David Crowther, NSTA President-Elect, and University of Nevada, Reno

Design and construct cantilevers using inexpensive and easily obtained materials. Then we will re-engineer our structures and analyze data from our designed models.

**Using Evidence and Data to Explain Scientific Phenomena**

(Grades 6–12) *Diamond Ballroom Salon 6, JW Marriott*  
Science Focus: LS, SEP

**Shawna Jaggi** (*spayton-edmonds@sandi.net*), Lincoln STEAM Middle College, San Diego, Calif.

Explore the use of scientific phenomena, data, and investigation to create models, construct explanations, and write arguments based on evidence and reasoning.

**Investigate then Interpret: Think Like a Scientist**

(Grades 6–12) *Diamond Ballroom Salon 7, JW Marriott*  
Science Focus: LS1.C, LS4.A, SEP4, SEP7

**Sarah Tazghini** (*stazghini@gmail.com*) and **David Studer**, Khalil Gibran International Academy, Brooklyn, N.Y.

Take part in an activity designed to increase engagement, student participation, and discussion. Apply your knowledge through scientific writing of CERs (differentiated) and engage in self and peer assessment through the use of a vocabulary buzzword tracker!

**Teaching Photosynthesis and Cellular Respiration Three Dimensionally with the Free Carbon TIME Curriculum**

(Grades 6–12) *Diamond Ballroom Salon 8, JW Marriott*  
Science Focus: LS, CCC, SEP

**Wendy Johnson**, Michigan State University, East Lansing  
Experience a three-dimensional unit focused on tracing matter and energy through the phenomenon of plant growth that engages students in investigations, modeling, and constructing explanations. Carbon TIME stands for Transformations In Matter and Energy.

**Connecting Engineering and Socio-Scientific Issues in School Classrooms**

(Grades 7–12) *Diamond Ballroom Salon 9, JW Marriott*  
Science Focus: GEN, NGSS

**Yaozhen Pan**, Illinois Institute of Technology, Chicago  
Join us for a simulation of mudslides for students to connect real-life events with science and engineering content! Lesson plans and activities provided.

**NSTA Press® Session: Inside or Out: The Perfect Place for Connecting Outdoor Science and Children’s Trade Books**

(Grades K–6) *Olympic 3, JW Marriott*  
Science Focus: GEN

**Christine Anne Royce** (*@caroyce; caroyce@aol.com*), NSTA President-Elect-Elect, and Shippensburg University, Shippensburg, Pa.

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

Engage in lessons that connect investigations in outdoor science topics with paired children’s literature to enhance the topic and integrate other discipline areas.

**INF Facilitating NGSS Practices Through Citizen Science**

(Grades 3–12) *Platinum Ballroom Salon B, JW Marriott*

Science Focus: GEN, INF, NGSS

**Emily Harris**, California Academy of Sciences, San Francisco  
Explore how to structure your citizen science projects to facilitate youth engagement in scientific reasoning practices in the NGSS.

**NGSS Using Scientific Phenomena to Understand the Three Dimensions of the NGSS**

(Grades 3–College) *515A, Convention Center*

Science Focus: GEN, NGSS

**Dawn O'Connor** ([dawno@acoe.org](mailto:dawno@acoe.org)), Alameda County Office of Education, Hayward, Calif.

Come experience a learning sequence anchored in making sense of phenomena and deepening your understanding of three-dimensional teaching and learning.

**Cleaning Up the Connections Between Science and Literacy: Integrating ELA and Science through Real-World Context**

(Grades 1–5) *Kentia Hall C, Convention Center*

Science Focus: ETS, SEP

**Nicole O'Neil**, Museum of Science, Boston, Mass.

Attention will be paid to integrating science and ELA instruction in the elementary classroom through a scientific investigation surrounding a real-world problem.

**Planting the Seeds of STEAM: Designing Plant Packages with the Consumer in Mind**

(Grades 1–5) *Kentia Hall E, Convention Center*

Science Focus: ETS1, SEP2

**Kathryn (Katy) Hutchinson** ([@eie\\_org](mailto:@eie_org)), Museum of Science, Boston, Mass.

We will engage in a hands-on elementary STEAM lesson and consider how engineering design challenges can be modified to develop meaningful STEAM activities.

**Toying with Integrative STEM (iSTEM) in Early Childhood Classrooms**

(Grades P–4) *Kentia Hall F, Convention Center*

Science Focus: ETS

**Nanette Marcum-Dietrich** ([ndietrich@millersville.edu](mailto:ndietrich@millersville.edu)) and **Sharon Brusic** ([sharon.brusic@millersville.edu](mailto:sharon.brusic@millersville.edu)), Millersville University, Millersville, Pa.

Discover how to engage your young learners in integrative STEM (iSTEM) through dynamic learning activities that promote problem solving, designing, and innovative thinking.

**Facilitating Learning in the K–5 Classroom**

(Grades K–5) *Kentia Hall G, Convention Center*

Science Focus: GEN, NGSS

**Megan Veldhuizen** ([@mrsveldhuizen](mailto:@mrsveldhuizen)), Lawton (Okla.) Public Schools

**Traci Richardson** ([trichardson@stillwaterschools.com](mailto:trichardson@stillwaterschools.com)), Stillwater High School, Stillwater, Okla.

Engage in thought-provoking discussions while participating in hands-on activities geared toward K–5. We'll address the science and engineering practices, disciplinary core ideas, and crosscutting concepts related to food while focusing on the importance of facilitating questions and using formative assessment probes in the classroom.

**Exploring Unknown Worlds Through Models, Images, and Data Analysis**

(Grades 3–8) *Kentia Hall H, Convention Center*

Science Focus: ESS

**Larry Lebofsky** ([lebofsky@lpl.arizona.edu](mailto:lebofsky@lpl.arizona.edu)), Planetary Science Institute, Tucson, Ariz.

Explore an “unknown world” as a model for the way scientists explore planets, dwarf planets, moons, comets, and asteroids with telescopes and spacecraft.

**Argue Like a Scientist #SocraticSeminars**

(Grades 3–College) *Kentia Hall K, Convention Center*

Science Focus: GEN, NGSS

**Kelsey Voller**, Director of Development, Sabin, Minn.

Find out how to facilitate Socratic seminars that support students in building and refining their ability to think, research, and argue like a scientist using Claim, Evidence, and Reasoning.

**Electrifying Ideas for Teaching Energy**

(Grades 6–12) *Kentia Hall M, Convention Center*

Science Focus: ETS, PS3

**M. Gail Jones**, **Emily Cayton** ([@caytonscience](mailto:@caytonscience); [emcayton@ncsu.edu](mailto:emcayton@ncsu.edu)), **Katherine Chesnutt** ([kmchesnutt@gmail.com](mailto:kmchesnutt@gmail.com)), and **Megan Ennes** ([@AFishNamedMeg](mailto:@AFishNamedMeg); [meennes@ncsu.edu](mailto:meennes@ncsu.edu)), North Carolina State University, Raleigh

**Rebecca Hite** ([@Sciencebecca](mailto:@Sciencebecca); [rebecca.hite@ttu.edu](mailto:rebecca.hite@ttu.edu)), Texas Tech University, Lubbock

Integrate new forms of green energy into your teaching. Explore new activities to teach about power and energy using solar cars, solar houses, and windmills.

### Develop a Scientific Model of the Atomic Structure from Experimental Data to Explain Phenomena

(Grades 9–College) *Kentia Hall N, Convention Center*  
 Science Focus: PS1.A, CCC1, CCC2, CCC4, SEP1, SEP2, SEP4, SEP6, SEP7

**Maria Simani** ([maria.simani@ucr.edu](mailto:maria.simani@ucr.edu)), University of California, Riverside

Analyze experimental data to develop, evaluate, and revise a model of the atomic structure to explain multiple macro-scale phenomena.

### Stellar Evolution—From Star Formation to Catastrophic Destruction

(Grades 7–12) *Kentia Hall P, Convention Center*  
 Science Focus: ESS

**Pamela Perry** ([pperry@lewistonpublicschools.org](mailto:pperry@lewistonpublicschools.org)), Lewiston High School, Lewiston, Maine

Model star formation, evolution, and destruction using images from NASA missions, including stellar nurseries, protostars, supernovas, white dwarfs, neutron stars, pulsars, supergiants, and black holes.

### Is It Hot in Here? Climate Change Lessons for Intermediate Students

(Grades 6–8) *Kentia Hall Q, Convention Center*  
 Science Focus: ESS3.A, ESS3.C, ESS3.D, PS2.B, CCC2, CCC4, CCC5, CCC7

**James Brown** (@NEED\_Project; [brownj@scolonie.org](mailto:brownj@scolonie.org)), The NEED Project, and South Colonie Central School District, Albany, N.Y.

**Nancy Gifford** (@NEED\_Project; [ngiffordscience@gmail.com](mailto:ngiffordscience@gmail.com)), The NEED Project, and Monomoy Regional Middle School, Chatham, Mass.

Work through a few interactive climate change activities aimed at encouraging your students to ask questions about their natural world and the energy that is all around them. Ideal for grades 6–8 teachers.

### NESTA, UCAR, and NASA Share: Bringing the Science of Climate Change to Young Learners with Elementary GLOBE

(Grades K–4) *Petree Hall D, Convention Center*  
 Science Focus: ESS2, ESS3, CCC1, CCC2, CCC7, SEP1, SEP2, SEP3, SEP4, SEP7, SEP8

**Lisa Gardiner** (@UCARSciEd; [lisagard2@gmail.com](mailto:lisagard2@gmail.com)), UCAR Center for Science Education, Boulder, Colo.

Bring climate change to elementary school! In this hands-on workshop, we'll share a new Elementary GLOBE storybook and activities that showcase the science of climate.



### Engaging 21st-Century Learners: STEM in PreK and TK Classrooms

(Preschool) *West Hall B-2, Convention Center*  
 Science Focus: GEN

**Jean Barbre** ([jbarbre@ocde.us](mailto:jbarbre@ocde.us)), Orange County Dept. of Education, Costa Mesa, Calif.

Prepare preschool through transitional kindergarten children for the 21st century through hands-on STEM activities. Learn how the California Foundations and Curriculum Framework align with the California Kindergarten Content Standards in a developmentally appropriate STEM classroom.

### Analog Digital in 3D

(Grades 7–8) *West Hall B-4, Convention Center*  
 Science Focus: PS4, CCC6, SEP3, SEP7

**Kathleen Reiss** ([kreis50@gmail.com](mailto:kreis50@gmail.com); [kmr530@interact.ccsd.net](mailto:kmr530@interact.ccsd.net)), West Preparatory Academy, Las Vegas, Nev.

**Cameron Roehm** ([roehmca@nv.ccsd.net](mailto:roehmca@nv.ccsd.net)), Cram Middle School, North Las Vegas, Nev.

Which is a better means of data transmission: analog or digital? Voyage through a 3-D unit that is designed to take students through real-world, engaging, and hands-on experiences in analyzing the structure and function of analog and digital systems in order to equip them with evidence to argue the question and engineer their own solution to a problem.

## 2:00–3:30 PM Exhibitor Workshops

### Tackle Renewable Energy with LEGO® Education

(Grades 6–8) 304C, Convention Center

Science Focus: PS3

Sponsor: LEGO Education

**Kelly Reddin**, LEGO Education, Billund, Jylland, Denmark

This workshop is designed for educators looking to teach renewable energy in a new and interactive way. Discover how to use LEGO Education models to teach your students about renewable energy sources such as solar, wind, and hydro energy.

### Human Physiology with Vernier

(Grades 9–College) 402A, Convention Center

Science Focus: ETS2, LS1

Sponsor: Vernier Software & Technology

**John Melville** ([info@vernier.com](mailto: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 7–College) 402B, Convention Center

Science Focus: ETS

Sponsor: Vernier Software & Technology

**Dave Vernier** ([info@vernier.com](mailto:info@vernier.com)), Vernier Software & Technology, Beaverton, Ore.

Learn from David Vernier in this engaging hands-on workshop. Explore ways to use Vernier sensors for introductory engineering design projects. Using our Digital Control Unit with LabQuest 2 and Logger Pro®, you will learn how to apply logic statements to set alarms and control electronic devices based on sensor input values.

### Smart Management of Water Resources Using TI Graphing Calculators and the TI-Innovator Hub

(Grades 6–12) 511 AB, Convention Center

Science Focus: ETS, SEP

Sponsor: Texas Instruments

**Fred Fotsch**, Texas Instruments, Dallas

In this hands-on workshop, learn how to enable your students to apply programming skills and knowledge of the water cycle and photosynthesis to solve a real-world problem. Your students will be able to design a smart water management system by programming a TI graphing calculator to control a TI-Innovator Hub with attached motors and temperature, moisture, and humidity sensors.

### Make a Wet Cell Battery

(Grades 6–8) 518, Convention Center

Science Focus: PS3.B, PS3.C, PS3.D, CCC2, CCC5, SEP1, SEP2, SEP3, SEP4, SEP5

Sponsor: Lab-Aids, Inc.

**Donna Markey**, Vista Visions Academy, Vista, Calif.

Although we live a battery-powered lifestyle, most of us (students included) have no idea how batteries actually work. In this workshop, we will engage in a SEPUP activity developed using results from field-testing and research in best practice. Make a wet cell battery, explore the effect of using different metal electrodes on battery output, and consider ways to reduce the number of discarded batteries in the waste stream.



**2:00–4:00 PM Meeting****NSTA Council Roundtable***(By Invitation Only)**Atrium 2, JW Marriott***2:30–3:00 PM Presentations****Globalizing Your Curriculum: Promoting Global Citizenship by Bringing the World into Our Classrooms***(Grades 6–College)**Plaza 3, JW Marriott*

Science Focus: GEN

**Shayna Cooke**, Collegiate School, Richmond, Va.

Use my experiences on what to do (and not do) in globalizing your science curriculum to enhance student learning. Leave with classroom-ready learning resources.

**Designing Nests for Loons: A STEM Integration Unit***(Grades 6–8)**514, Convention Center*

Science Focus: LS, SEP

**Selcen Guzey**, Purdue University, West Lafayette, Ind.

We will present a research-based STEM Integration unit designed for middle school life science classes

**Engaging Middle Years Girls in Math and Science Through Robotics Inquiry***(Grades 4–9)**Kentia Hall J, Convention Center*

Science Focus: ETS

**Gina Cherkowski** (@gcherkowski; @learningstem; gina@stemlearninglab.com), STEM Learning Lab, Calgary, Alta., Canada

In this research project, we engaged middle school girls in a STEM inquiry. Findings indicated participants gained a conceptual understanding of math and a passion for STEM.

**How Can NGSS Fit in My Physics Classroom?***(Grades 9–12)**Kentia Hall O, Convention Center*

Science Focus: PS3.B, PS4.A, PS4.C, CCC1, CCC2, CCC4, SEP2, SEP3, SEP4, SEP6

**Scott Schneider** (@gssquared65; scott.schneider@jefferson.kyschools.us), **John Docter** (john.docter@jefferson.kyschools.us), and **Amanda Downey** (amanda.downey@jefferson.kyschools.us), Fairdale High School, Louisville, Ky.

Join two grade 9 teachers (and an instructional coach) will share samples and analysis tools of how they focused on discourse and critical writing with the NGSS.

**3:00–6:00 PM Short Courses****Kids Love Rocks, So Will You: Introducing Physical Science BIG IDEAS (SC-15)***(Grades P–K) Tickets Required; \$58 San Gabriel A, Westin Science Focus: GEN***Bob Williams** (rivers40@yahoo.com), Consultant, Belmont, Tex.**Mary Hobbs** (maryhobbs@utexas.edu), The University of Texas at Austin

For description, see Volume 1, page 61.

**Hands-On Mathematics in Science Education (SC-16)***(Grades 1–5) Tickets Required; \$30 Santa Anita A, Westin Science Focus: ETS, LS, PS, CCC1, CCC3, SEP1, SEP2, SEP3, SEP4, SEP5***Johannes Strobel** (strobelj@missouri.edu), University of Missouri, Columbia**Olivia Hua** (olivia.hua@mail.mcgill.ca), McGill University, Montreal, Que., Canada

For description, see Volume 1, page 61.

**3:30–4:00 PM Presentations****INF IMAGINE HKIS: Family STEM Event***(Grades K–8)**Kentia Hall J, Convention Center*

Science Focus: INF

**Wendy Smith** (@wssmith; wendysmith1005@gmail.com), Hong Kong International School, Tai Tam

Imagine, Tinker, Make, and Learn is the theme of our annual IMAGINE Hong Kong International School family event. Learn how to plan, organize, and run an annual STEM event at your school. Ideas and resources will be shared.

**Using a Chicken Coop and Raised Gardens to Teach Sustainability***(Grades 3–7)**Kentia Hall R, Convention Center*

Science Focus: LS

**Michael Murphy** (mike.murphy@woodward.edu), Woodward Academy, College Park, Ga.

Be sure to flock to this session on ways we use our chickens and raised garden beds with students to show them the importance of chickens and plants and how they apply to a unit on sustainability.

**Student Data Collection, Modeling, and Analysis of Nutrient Levels and Algae Growth in Lake Champlain, Vermont***(Grades 10–12)**West Hall B-5, Convention Center*

Science Focus: ETS1, LS2, CCC, SEP

**Mark Powers** (mpowers@anwsu.org), Vergennes Union High School, Vergennes, Vt.

Students perform a STEM-oriented, place-based, semester-long investigation about how chemical nutrient runoff affects algae growth and lake water quality in Lake Champlain, Vermont.

### 3:30–4:30 PM Featured Speaker

#### Engaging ALL in STEM

(General)

Theatre (411), Convention Center

Science Focus: GEN



**Louie Lopez** (@LouieRLopez; @USAEOP; [louis.r.lopez.civ@mail.mil](mailto:louis.r.lopez.civ@mail.mil)), Chief, STEM Education and Outreach Office, and AEOP Cooperative Agreement Manager, U.S. Army Research, Development, and Engineering Command, Aberdeen Proving Ground, Md.

Presider: Sue Whitsett, AEOP Project Director, NSTA, Arlington, Va.

Panelists:

**Bhagyashri Chander**, Academic Center of Sciences, Frisco, Tex.

**Laura Wilbanks** Dora High School, Dora, N.Mex.

**Ingrid Rapatz-Roettger**, Ramey Unit School, DoDEA, Aguadilla, P.R.

**Emily Ashkin**, Rice University, Houston, Tex.

Louie will share AEOP's collaborative, cohesive portfolio of Army-sponsored STEM programs that effectively engage, inspire, and attract the next generation of STEM talent through K–16 summer enrichment activities, competitions, and research apprenticeships.

*A former Marine, Louie Lopez currently serves as the chief of Science, Technology, Engineering, and Mathematics (STEM) and Education Outreach for the U.S. Army Research Development and Engineering Command's (RDECOM) Programs and Engineering Office at Aberdeen Proving Ground (APG). His responsibilities include the technical and fiscal oversight of the Army Educational Outreach Program (AEOP) cooperative agreement award on behalf of the Office of the Deputy Assistant Secretary of the Army for Research and Technology (DASA R&T), coordination of the Army's national STEM efforts across the Army science and technology community and its academic partners, and coordination of regional STEM efforts across Aberdeen Proving Ground, Maryland.*

*Prior to joining RDECOM in 2011, Louie worked as director of STEM programs in the Lyles College of Engineering at California State University, Fresno from 2006-2011, and previously served as associate director for University of California Mathematics, Engineering, Science Achievement (MESA) Programs at California State University, Fullerton from 1998 to 2005. He also taught computer science courses at California State University, Fullerton.*

### 3:30–4:30 PM Presentations

#### An Innovative Approach to Recruit and Retain Historically Underrepresented Students in Engineering

(College)

Olympic 1, JW Marriott

Science Focus: GEN

**Nicole Gutzke**, Cal Poly Pomona, Calif.

Hear about strategies that Cal Poly Pomona's Women in Engineering Program uses to recruit, retain, and graduate historically underrepresented students in engineering.

#### AMSE-Sponsored Session: Diversity and Equity: Changing Classroom Assessment Practices to Support Science Achievement

(Grades 1–12)

Platinum Ballroom Salon A, JW Marriott

Science Focus: GEN

**Marion Reeves** ([marion-reeves@comcast.net](mailto:marion-reeves@comcast.net)), Science Education Consultant, Avondale Estates, Ga.

Changing instructional practices is one part of increased success for students in measures of science achievement. Aligning assessment practices is also needed for student success.

#### How We Made Our First NGSS Class

(Grades 6–College)

Platinum Ballroom Salon D, JW Marriott

Science Focus: GEN, NGSS

**Becky McKinney** (@NGSSMadeMeDoIt; [rmckinney@euhsd.org](mailto:rmckinney@euhsd.org)), San Pasqual High School, Escondido, Calif.

**Brenda Minjares** (@bmminj), Escondido High School, Escondido, Calif.

**Ruth Hellams** (@rhellams11; [rhellams@euhsd.org](mailto:rhellams@euhsd.org)), Escondido Union High School District, Escondido, Calif.

Hear how a small group of teachers and a dedicated district leader generated their first NGSS-focused class. We will share the process and tools we used to develop and implement the course.

#### Making the Science Classroom a Safe Space for LGBT Students

(General)

Platinum Ballroom Salon H, JW Marriott

Science Focus: GEN

**Steve Rich** (@bflyguy; [bflywriter@comcast.net](mailto:bflywriter@comcast.net)), University of West Georgia, Carrollton

Learn inclusive practices to help LGBT (Lesbian, Gay, Bisexual, and Transgender) students feel safe and respected in the science classroom.

**INF Leveraging Green Schools: Using Your School Environment as a Learning Laboratory***(Grades K–12) Platinum Ballroom Salon I, JW Marriott*

Science Focus: GEN, INF, NGSS

**Laurel Kohl**, 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. Together we have turned our schools and school yards into learning laboratories.

**Science Olympiad Urban Schools Initiative Kick Starter***(Grades 3–12) Platinum Ballroom Salon J, JW Marriott*

Science Focus: GEN, SEP

**Kelly Price-Colley** (@KPriceGA; *kellyrprice@comcast.net*), Forsyth County Schools, Cumming, Ga.**John Loehr** (*jfloehr@soinc.org*), Science Olympiad, Oakbrook Terrace, Ill.

Do you wonder how to engage underserved populations/districts with K–12 STEM outreach? Science Olympiad has a solution for you. We will share the success of the Science Olympiad Urban Schools Initiative and obtain resources for applying for grant funds to fuel your own Urban Science Olympiad program.

**Do You Know What You Can Do?***(Grades 9–12) Plaza 1, JW Marriott*

Science Focus: GEN, SEP

**Lee Ann Haralambakis**, Rolling Meadows High School, Rolling Meadows, Ill.

Come see how the development of common performance assessment rubrics can be used to assess science and engineering practices and support student growth.

**INF Bringing PBL from Class to Community***(Grades 9–10) Plaza 2, JW Marriott*

Science Focus: GEN, INF

**Jillian Estrella** (*jestrel2@houstonisd.org*) and **Julie Lockhart** (*jlockhal@houstonisd.org*), Energy Institute High School, Houston, Tex.

Inject excitement and ownership into projects by taking them to a whole new level as multiple grade levels join forces to help their local community.

**NSELA-Sponsored Session: Uncovering Teacher Misconceptions Through the Use of Formative Assessment Strategies***(Grades K–12)**Plaza 3, JW Marriott*

Science Focus: ESS1, SEP2, SEP6, SEP7

**Page Keeley** (@CTSKeeley; *pagekeeley@gmail.com*), 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla.**Brian Kruse** (*bkruse@astrosociety.org*), Astronomical Society of the Pacific, San Francisco, Calif.

Learn how to use formative assessment strategies when engaging in professional development with inservice teachers, and as a part of working with preservice teachers.

**Award-Winning Share-a-Thon: Featuring NSTA Distinguished Teachers***(General)**152, Convention Center*

Science Focus: GEN, SEP3

**Tom Lough** (*tom.lough@gmail.com*), Retired Educator, Round Rock, Tex.**Paul Adams** (*padams@fhsu.edu*), Fort Hays State University, Hays, Kans.**James Brown** (*brownj@scolonie.org*), South Colonie Central School District, Albany, N.Y.**Susan German** (@susan\_german; *susangermanscienceteacher@gmail.com*), Hallsville Middle School, Hallsville, Mo.**Alan McCormack** (*amccorma@mail.sdsu.edu*), 2010–2011 NSTA President, and Professor Emeritus, San Diego State University, San Diego, Calif.**Tricia Shelton** (@TdiShelton; *tdishelton@gmail.com*), Boone County High School, Florence, Ky.**Julie Taylor** (*julie\_taylor@eee.org*), Teacher/Science Mentor/NASA Consultant, Victorville, Calif.

Come for conversations with NSTA Distinguished Teaching Award winners who share reflections, describe science teaching approaches/experiences, and discuss favorite projects and current interests.

**Exploring Engineering Design with Elementary and Preservice Teams Through Distance Technology: Edible Lunar Vehicle***(Grades 2–5, College)**502B, Convention Center*

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

**Kate Baird** (*katebaird1430@gmail.com*), Indiana University–Purdue University Columbus**Stephanie Coy** (*stephanie.coy@mnps.org*), Inglewood Elementary School, Nashville, Tenn.

Join us as we model the engineering design process that brought together students from across the country to design space vehicles made of food.

### **Maker Faire: Taking a STEAM Fair to the Next Level**

(Grades P–12) 504, Convention Center

Science Focus: GEN, INF, CCC, SEP

**Brian Newburger** ([bnewburger@socsd.org](mailto:bnewburger@socsd.org)), Tappan Zee High School, Orangeburg, N.Y.

**Samantha Levine** ([@Sciencediva14](mailto:@Sciencediva14); [sdd131424@yahoo.com](mailto:sdd131424@yahoo.com)) and **Brian Culot** ([bculot@socsd.org](mailto:bculot@socsd.org)), South Orangetown Central School District, Blauvelt, N.Y.

Get the steps on how to prepare, setup, and participate in a K–12 communitywide maker faire.

### **Middle School Science and Algebra I Collaboration: Ohm’s Law as a Mathematical Model**

(Grades 7–9) 505, Convention Center

Science Focus: ETS1.A, ETS2.A, LS2, PS2.A, PS2.C, PS3.B, PS3.C, CCC2, CCC4, CCC5, SEP2, SEP4, SEP5, SEP8

**Ruth Miller** ([@RM11235813](mailto:@RM11235813); [rmiller@greenhillsschool.org](mailto:rmiller@greenhillsschool.org)) and **Susan Beamish** ([sbeamish@greenhillsschool.org](mailto:sbeamish@greenhillsschool.org)), Greenhills School, Ann Arbor, Mich.

Our eighth-graders used homemade windmills and statistical software to develop Ohm’s Law. We used unfamiliar vocabulary and each other’s lenses to make authentic content connections.

### **In My Defense: Writing and Presenting Scientific Research**

(Grades 6–8) 506, Convention Center

Science Focus: GEN, SEP1, SEP3, SEP4, SEP5, SEP7, SEP8

**Melyssa Ferro** ([@MelyssaFerro](mailto:@MelyssaFerro); [mferro@caldwellschools.org](mailto:mferro@caldwellschools.org)), Syringa Middle School, Caldwell, Idaho

**Beth VanVliet**, Jefferson Middle School, Caldwell, Idaho  
We will share a stair-stepped project for middle school students that allows them to use scientific processes to complete and present an APA-formatted paper.

### **Abstract Concepts for the Concrete Mind: Techniques and Lessons to Engage Middle School Students and Provide a Valuable Purpose for Learning**

(Grades 5–9) 507, Convention Center

Science Focus: LS, PS, SEP

**Nicole McRee** ([mcee.nicole@d46.org](mailto:mcee.nicole@d46.org)) and **Tracy Bratzke** ([clownfish39@yahoo.com](mailto:clownfish39@yahoo.com)), Grayslake Middle School, Grayslake, Ill.

Inquiry-based, ready-to-use activities in chemistry and life science will be shared that incorporate cross-curricular and multi-modal learning and meet the NGSS science and engineering practices. Encourage your students to think critically and analytically.

### **Matter Matters: A Three-Dimensional Middle School Unit**

(Grades 6–8) 513, Convention Center

Science Focus: ETS1, PS1, CCC, SEP

**Stephanie Konowitz** ([steph.konowitz@gmail.com](mailto:steph.konowitz@gmail.com)), Chittenden South Supervisory Union, Hinesburg, Vt.

**Jessica Kramer** ([jkramer@cssu.org](mailto:jkramer@cssu.org)), Williston Central School, Williston, Vt.

Engage in and become familiar with an original three-dimensional learning unit focused on matter and its interactions, including “figuring out” phenomena, engineering design, and storylining.

### **Join an NSTA Journal Manuscript Review Panel**

(General) 514, Convention Center

Science Focus: GEN

**Ken Roberts** ([ken\\_r@nsta.org](mailto:ken_r@nsta.org)), Assistant Executive Director, Journals, NSTA, Arlington, Va.

Meet with the editorial staff of NSTA’s journals to learn how you can apply to serve on a Manuscript Review Panel.

### **NGSS The Essentials of High-Quality NGSS Implementation for All Students**

(Grades P–12) 515A, Convention Center

Science Focus: GEN, NGSS

**Vanessa Lujan** ([@berkeleyscience](mailto:@berkeleyscience); [vlujan@berkeley.edu](mailto:vlujan@berkeley.edu)), The Lawrence Hall of Science, University of California, Berkeley

Discuss key strategies and explore new tools to build capacity around what it takes to implement NGSS for all students within a district or school.

### **Inquiry—Without Reinventing the Wheel**

(Grades 6–College) 515B, Convention Center

Science Focus: GEN, SEP

**Aaron Rudolph** ([@crowdedbeaker](mailto:@crowdedbeaker); [arudolph@pvcsd.org](mailto:arudolph@pvcsd.org)), Perkiomen Valley School District, Collegeville, Pa.

Gain clear, practical ideas for transitioning existing lab activities and demonstrations into a more inquiry-based format.

### **Putting It All Together: The Crossroads of NGSS, CCSS, and ISTE in the Elementary Classroom**

(Grades K–5) Kentia Hall B, Convention Center

Science Focus: GEN, NGSS

**Caroleann DelJuidice** ([@ms\\_deljuidice](mailto:@ms_deljuidice); [cdeljuidice@mjbuczekschool.org](mailto:cdeljuidice@mjbuczekschool.org)), PS 48, New York, N.Y.

Meeting NGSS isn’t “Out with the Old.” Incorporating existing curriculum with hands-on visual kinesthetic opportunities, NGSS can be woven into curriculum seamlessly elevating learning.

**Creative Co-Teaching***(Grades K–8) Kentia Hall L, Convention Center*

Science Focus: GEN, NGSS

**Dorian Janney** (@JanneyDorian; [dorian.w.janney@nasa.gov](mailto:dorian.w.janney@nasa.gov)), NASA Goddard Space Flight Center, Greenbelt, Md. A team of a special educator and a general science educator will share some best practices for many effective models to teach exceptional students.

**Model My Watershed: Using Place-Based Education to Promote STEM Learning and Watershed Citizenship***(Grades 7–College) Kentia Hall P, Convention Center*

Science Focus: GEN, SEP

**Nanette Marcum-Dietrich** (@DrNanette; [ndietrich@millersville.edu](mailto:ndietrich@millersville.edu)), Millersville University, Millersville, Pa.

**Steve Kerlin** ([skerlin@stroudcenter.org](mailto:skerlin@stroudcenter.org)), Stroud Water Research Center, Avondale, PA

Come learn about an exciting, free online modeling application that gives anyone (age 8+) the ability to use STEM practices to explore their local watershed.

**From the Merman to the Weatherman—The Evolution of Weather Prediction***(Grades 5–9)**Kentia Hall Q, Convention Center*

Science Focus: ESS2.D

**Jennifer Thompson**, James Martin Middle School, Charlotte, N.C.

See how you can use I-charts to encourage writing, primary sources to encourage literacy, and small groups to encourage collaboration...all while teaching major weather concepts!

**NESTA and PRI Share: *Teacher-Friendly Guides™* to the Earth Science of the United States: Regional Content Guides for Place-Based Approaches to Earth System Science Education***(Grades 4–College)**Petree Hall D, Convention Center*

Science Focus: ESS, INF, CCC, SEP

**Robert Ross**, Paleontological Research Institution, Ithaca, N.Y.

Free online guides offer comprehensive review of the Earth science outside your classroom door and foster investigations of your local environment. For more information, see [www.teacherfriendlyguide.org](http://www.teacherfriendlyguide.org).

**3:30–4:30 PM Hands-On Workshops****Exploring Practices, Nature of Science, and Science in Society: Analyzing Historical Primary Sources from the Library of Congress***(Grades K–12) Diamond Ballroom Salon 2, JW Marriott*

Science Focus: GEN, SEP

**Michael Apfeldorf** (@TeachingLC; [mapf@loc.gov](mailto:mapf@loc.gov)) and **Cheryl Lederle** (@TeachingLC; [cled@loc.gov](mailto:cled@loc.gov)), Library of Congress, Washington, D.C.

Experience hands-on strategies to engage students with scientific notebooks, letters, photos, and drawings, highlighting science practices, nature of science, and connections between science and society.

**NSTA Press® Session: Everyday Engineering***(Grades 5–9) Diamond Ballroom Salon 3, JW Marriott*

Science Focus: ETS

**Richard Moyer** ([rhmoyer@umich.edu](mailto:rhmoyer@umich.edu)), Professor Emeritus, University of Michigan–Dearborn

Participants engage in STEM activities related to everyday engineering (such as ballpoint pens, life jackets, and sweet spots) and learn how to create their own lessons accordingly.

**Hooks and Investigations in the STEAM Classroom***(Grades 7–12)**Diamond Ballroom Salon 6, JW Marriott*

Science Focus: GEN, SEP

**Jose Rivas**, Lennox Academy, Inglewood, Calif.

Learn to develop effective hooks and investigations that challenge student misconceptions.

**Butterfly Bonanza***(General)**Diamond Ballroom Salon 7, JW Marriott*

Science Focus: LS

**Nancy Sale** (@MrCuddles1681; [butterflybonanza@yahoo.com](mailto: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 wealth of digital data.

**Modeling and the Three Dimensions of the NGSS in Middle School Genetics***(Grades 6–10)**Diamond Ballroom Salon 9, JW Marriott*

Science Focus: LS3, CCC1, CCC2, SEP2

**Maia Willcox** (@SEPUP\_UCB; [mwillcox@berkeley.edu](mailto:mwillcox@berkeley.edu)), The Lawrence Hall of Science, University of California, Berkeley. Participate in hands-on genetics activities that integrate the science practice of modeling into a three-dimensional approach supporting the NGSS for heredity.

### A New Tool for Using Smithsonian Resources to Support Science in the Classroom

(Grades 4–10) *Diamond Ballroom Salon 10, JW Marriott*  
Science Focus: ESS1, ESS3, ETS, LS2, LS4, PS1

**Colleen Marzec** ([marzecc@si.edu](mailto:marzecc@si.edu)), **Maggy Benson** ([ben-sonm@si.edu](mailto:ben-sonm@si.edu)), and **Devin Reese** ([reesed@si.edu](mailto:reesed@si.edu)), Smithsonian National Museum of Natural History, Washington, D.C.

**Ashley Naranjo** (@SmithsonianLab; [naranjoa@si.edu](mailto:naranjoa@si.edu)), Smithsonian Institution, Washington, D.C.

Using episodes from the *Smithsonian Science How* video series, we explore how to curate related instructional resources using the new online Smithsonian Learning Lab.

### Faculty Learning Program: Professional Learning Experience for STEM University Faculty to Improve Teaching Practice

(College) *Olympic 3, JW Marriott*  
Science Focus: GEN

**Lynn Tran** ([lynn.tran@berkeley.edu](mailto:lynn.tran@berkeley.edu)) and **Catherine Halversen** ([chalver@berkeley.edu](mailto:chalver@berkeley.edu)), The Lawrence Hall of Science, University of California, Berkeley

This workshop uses activities and evaluation from a faculty development program designed for STEM faculty to improve their teaching. Actively participate to deepen your understanding about how learning happens, and how to teach more effectively to support learning. Read and discuss current research on learning and teaching in higher education.

### Using Computer Science to Engage Students and Teach Physics

(Grades 9–12) *Platinum Ballroom Salon B, JW Marriott*  
Science Focus: PS, SEP

**Shannon Morey** ([shannon.morey@gmail.com](mailto:shannon.morey@gmail.com)), East Boston High School, Boston, Mass.

**Marna Eckels** ([meckels@bostonpublicschools.org](mailto:meckels@bostonpublicschools.org)), Dearborn STEM Academy, Boston, Mass.

Start designing your own content-related computer science lessons after hearing about implementing Pencil Code lessons into freshman physics classes. Bring a laptop or tablet!

### Differentiated Instruction to Engage Everyone in Your Classroom

(Grades 6–12) *Platinum Ballroom Salon F, JW Marriott*  
Science Focus: GEN, SEP

**Donetrus Hill** (@Dr.Donetrus; [donetrus.hill@gmail.com](mailto:donetrus.hill@gmail.com)), Meadowdale High School, Dayton, Ohio

Learn time-tested differentiated instruction strategies you can use next week. These strategies will stimulate academic interest and engage ALL of your students, while maximizing student achievement.

### Inquiry-Based Activities for Middle School and High School Physics Classrooms

(Grades 6–College) *Platinum Ballroom Salon G, JW Marriott*  
Science Focus: ETS, PS2.A, PS3.A, PS3.B, PS3.C, PS4.A, PS4.B, SEP

**Paige Evans** (@PaigeKEvans; [pevans@uh.edu](mailto:pevans@uh.edu)), University of Houston, Tex.

Receive examples of inquiry-based activities that preservice and inservice teachers can use in their physics or physical science classrooms.

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

(Grades P–3) *Kentia Hall A, Convention Center*  
Science Focus: PS2

**Ruth Ruud** ([ruudruth61@gmail.com](mailto:ruudruth61@gmail.com)), Cleveland State University, Cleveland, Ohio

**Juliana Texley** (@JulianaTexley; [texle1j@cmich.edu](mailto:texle1j@cmich.edu)), 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant

Don't look now, but the CCSS asks that you teach physical sciences as early as kindergarten, and the NGSS have 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!

### ARMed

(Grades 3–6) *Kentia Hall C, Convention Center*  
Science Focus: ETS1.B, ETS1.C, ETS2.B, CCC2, CCC6, SEP1, SEP2, SEP6, SEP8

**Morris McCormick** (@CommonCore1; [morris.mccormick@armintaes.net](mailto:morris.mccormick@armintaes.net)), Arminta Street Elementary School, North Hollywood, Calif.

Presider: Stacey Keckler, Lincoln Middle School, Kenosha, Wis.

Reverse engineering—join in for this task-based workshop where the worlds of deductive reasoning, inductive reasoning, children's literature, and the engineering design process meet.

### STEAMing Through the NGSS

(Grades K–5) *Kentia Hall D, Convention Center*  
Science Focus: GEN, NGSS

**Dawn Getzandanner** (@dawngetzandanner; [dawn.getzandanner@fcps.org](mailto:dawn.getzandanner@fcps.org)), Spring Ridge Elementary School, Frederick, Md.

Take part in hands-on lessons that share the connections between the arts and the NGSS. Emphasis will be placed on curriculum, instruction, and assessment.

### Made for the Shade: A SUN-sational Engineering Design Unit

(Grades K–2) *Kentia Hall E, Convention Center*  
 Science Focus: ESS1, ETS1, LS1, PS1, PS3, CCC1, CCC2, CCC5, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

**Laura Kitagawa** (*lkitagawa@a-cs.org*), Almaden Country School, San Jose, Calif.

Inspire your students to design and build shade structures to protect UV-sensitive beaded lizards from the Sun. Get everything you need, including your own lizard!

### Ramps and Pathways: An Integrative STEM and Literacy Activity

(Grades P–2) *Kentia Hall F, Convention Center*  
 Science Focus: PS2.A, CCC1, CCC2, SEP1, SEP2, SEP3, SEP6, SEP7, SEP8

**Beth Van Meeteren**, University of Northern Iowa, Cedar Falls

Hear stories, view a video of children engaging in the materials, and actively engage with materials yourself to discuss how engineering stimulates vocabulary, writing, and reading.

### Engineering in the Elementary Classroom

(Grades K–5) *Kentia Hall G, Convention Center*  
 Science Focus: ETS

**Claudine Phillips** (*cphp2388@lausd.net*), Los Angeles (Calif.) Unified School District

Students become architects and engineers as they collaborate to build the fourth little piggy's house and save him or her from the big bad wolf!

### Crosscutting NASA's Journey to Mars with NGSS in Grades 3–8

(Grades 3–8) *Kentia Hall H, Convention Center*  
 Science Focus: ETS1, ETS2.B, PS2.A, PS3.A, PS3.B, PS3.C, CCC2, CCC3, CCC4, CCC7, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP7

**Brandon Hargis** (*brandon.m.hargis@nasa.gov*), NASA Johnson Space Center/Texas State University, Houston, Tex.

**Veronica Leija** (*veronica.m.leija@nasa.gov*), NASA, Houston, Tex.

Presider: Crystal Del Rosso, Paragon TEC, Houston, Tex. Build and test an Orion Spacecraft! Connect NASA's Journey to Mars with STEM classrooms to target the NGSS science and engineering practices and crosscutting concepts.

### Using Student-Created Virtual Field Trips to Enhance Learning

(Grades 4–12) *Kentia Hall K, Convention Center*  
 Science Focus: GEN

**Kathy Biernat** (*@ScientistMaker*; *kbiernat@stmaryeg.org*), St. Mary's Visitation School, Franklin, Wis.

Travel inside the body and out to the planets through student-designed Google cardboard experiences. Create your own virtual field trip with this innovative tool.

### Sound and Waves: An Integrated K–8 Hands-On Approach Supporting the NGSS and CCSS ELA

(Grades K–8) *Kentia Hall M, Convention Center*  
 Science Focus: PS4

**Chihche Tai** (*cctai59@gmail.com*) and **Laura Robertson** (*robertle@etsu.edu*), East Tennessee State University, Johnson City

Receive practical ideas to build understanding about how to combine reading and hands-on activities as tools to understand the nature of wave movement.

### Using Modeling Practices to Create Optimal Learning Moments in High School Project-Based Physical Science Units

(Grades 9–12) *Kentia Hall O, Convention Center*  
 Science Focus: PS, SEP

**Deborah Peek-Brown** (*dpbrown@msu.edu*), **Joseph Krajcik** (*@krajcijkjoe*; *krajcik@msu.edu*), and **Kellie Finnie** (*cunni338@su.edu*), CREATE for STEM Institute, Michigan State University, East Lansing

**Tom Bielik** (*tbielik@msu.edu*), Michigan State University, East Lansing

**Sandra Erwin** (*erwins@harpercreek.net*) and **Steve Barry** (*barrys@harpercreek.net*), Harper Creek High School, Battle Creek, Mich.

Explore teacher-developed project-based units that provide strategies for supporting students in the practice of modeling using physical science core ideas to explain phenomena.

### Hands-On Human Evolution

(Grades 6–College) *Kentia Hall S, Convention Center*  
 Science Focus: LS4, CCC1, CCC2, CCC4, CCC6, SEP

**Margarita Hernandez** (*@UFCPET*; *maggihern1@gmail.com*) and **Julie Bokor** (*jbokor@ufl.edu*), University of Florida, Gainesville

We will approach the subject of human evolution in an evidence-based manner, using both morphological and molecular data to come to sound scientific conclusions.

**INF Partnering with Parents to Level the Playing Field in Science**

(Grades P–4)

West Hall B-2, Convention Center

Science Focus: INF

**Maryann Stimmer** ([mstimmer@fhi360.org](mailto:mstimmer@fhi360.org)) and **Ben Dworken** ([bdworken@fhi360.org](mailto:bdworken@fhi360.org)), Educational Equity at FHI 360, New York, N.Y.

The best way to level the playing field in science is to involve parents. Learn about an easy-to-implement STEM program for involving parents.

**Zombies, Space, and Connecting Creativity to STEM**

(Grades 5–8)

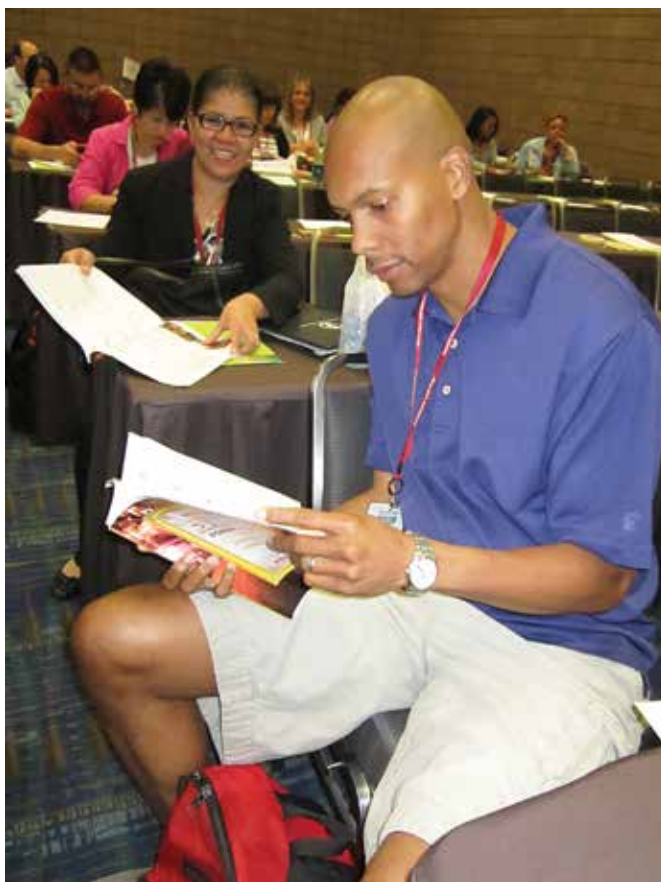
West Hall B-3, Convention Center

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

**Kait Steele** ([@826national](mailto:@826national); [kait@826national.org](mailto:kait@826national.org)), 826 National, San Francisco, Calif.

**Julius Panoriñan** ([juliusp@gmail.com](mailto:juliusp@gmail.com)), Teaching and Writing Specialist, Los Angeles, Calif.

This interactive session examines best practices in pairing creative writing with STEM. We'll explore accessible lessons designed to boost engagement, confidence, and competency across disciplines.



**4:00–4:30 PM Presentations**

**A Response to Intervention Model for Argument-Based Inquiry: The Importance of Using Student Writing to Find Out What They Really Know**

(Grades K–6)

502A, Convention Center

Science Focus: GEN, SEP2, SEP4, SEP6, SEP7, SEP8

**Mason Kuhn** ([@Masonkuhn50](mailto:@Masonkuhn50); [mason.kuhn@uni.edu](mailto:mason.kuhn@uni.edu)), University of Northern Iowa, Cedar Falls

Invigorate your lessons with a model that focuses on student writing, ABI, and how to improve student conceptual understanding based on their schema.

**A Is for Theater and STEM**

(Grades 4–8)

Kentia Hall J, Convention Center

Science Focus: INF, CCC

**Wendi Laurence** ([@Createosity](mailto:@Createosity); [wendi@create-osity.com](mailto:wendi@create-osity.com)), Salt Lake City (Utah) School District

Join me for lessons learned and curriculum used to create a successful theater/STEM summer program.

**1230 Science: Inclusive, Affordable In-School Research Projects for All**

(Grades 7–College)

Kentia Hall R, Convention Center

Science Focus: GEN, INF, SEP

**Disan Davis** ([@disandavis](mailto:@disandavis); [@rockedu](mailto:@rockedu); [ddavis01@rockefeller.edu](mailto:ddavis01@rockefeller.edu)), The Rockefeller University, New York, N.Y.

Let me introduce you to the process and tools for establishing and sustaining authentic, affordable science research experiments in your school while being collaborative and engaging for your students.

**Hawken's Intensive Program Through a Science Lens**

(Grades 9–12)

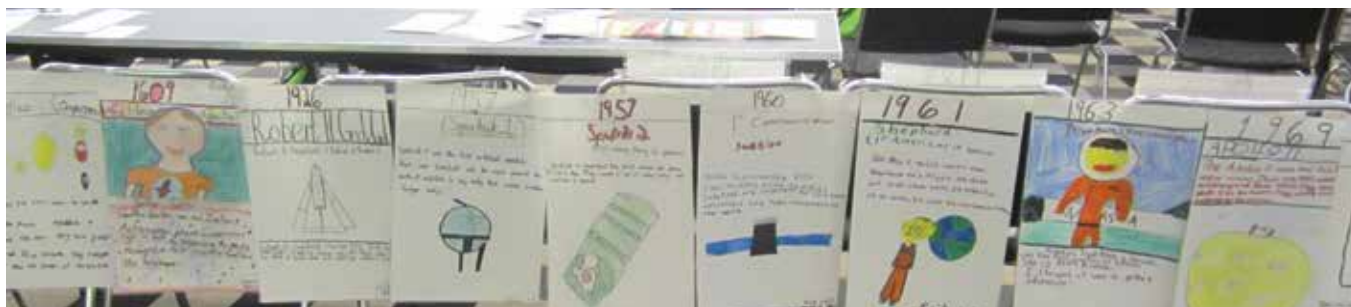
West Hall B-5, Convention Center

Science Focus: GEN

**Jennie Becker** ([jbeck@hawken.edu](mailto:jbeck@hawken.edu)) and **Brendan Daly** ([bdaly@hawken.edu](mailto:bdaly@hawken.edu)), Hawken Upper School, Gates Mills, Ohio

We will outline the format of Hawken's unique intensive program using our marine science class as the exemplar.





### 5:00–5:30 PM Presentations

#### A Consilient Approach to History and Science

(Grades 7–12)

501C, Convention Center

Science Focus: LS3

**Nathan Mook** ([nmook@chandler.school.org](mailto: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 using new arenas of scientific investigation (genetics, forensics, heredity, pedigrees).



#### Poetry for Young Investigators

(Grades P–3)

502A, Convention Center

Science Focus: ESS2.D, LS1.B, LS2.A, PS1.A, PS2.A, SEP1, SEP3, SEP4, SEP8

**Wendy Frazier** ([@wendymfrazier](mailto:@wendymfrazier); [wfrazier@hbu.edu](mailto:wfrazier@hbu.edu)), Houston Baptist University, Houston, Tex.

Come learn how early childhood educators use poetry to support young learners' literacy development as they explore the wonders of their world.



#### A STEM Approach to Integrate Drones as a Teaching and Technology Tool

(Grades 6–8)

515B, Convention Center

Science Focus: ESS2.D, ESS2.E, ESS2.C, ESS3.C, ETS, LS1.A, LS2.A, PS1, PS2.M, PS2.C, CCC3, CCC4, CCC6, SEP

**Aubrey Crook** ([aubreycrook@houston.com](mailto:aubreycrook@houston.com)), Georgia Youth Science and Technology Centers, Kennesaw

Would you like to incorporate drones into your curriculum, but are clueless as how to get started? Learn basic information to get your drone program up and soaring.

#### Interactive Science Read Alouds and Scientific Modeling

(Grades P–5)

Kentia Hall B, Convention Center

Science Focus: GEN, SEP

**Michelle Salgado** ([@SalgadoScience](mailto:@SalgadoScience); [msalgado@uw.edu](mailto:msalgado@uw.edu)) and **Karin Lohwasser** ([loh2o@uw.edu](mailto:loh2o@uw.edu)), University of Washington, Seattle

**Kaia Tomokiyo** ([@kindercolors\\_k](mailto:@kindercolors_k); [kaia.tomokiyo@highlineschools.org](mailto:kaia.tomokiyo@highlineschools.org)), Highline Public Schools, Seattle, Wash. Receive an overview of how interactive science read alouds are used by the Ambitious Science researchers in engaging students in the modeling process.

#### Let's Get Physical! Engineering Design Challenges for Middle School Physical Science

(Grades 5–8)

Kentia Hall M, Convention Center

Science Focus: ETS1, PS2, PS3

**Jeannie Gargiulo** ([jeanniegargiulo@gmail.com](mailto:jeanniegargiulo@gmail.com)), Fieldston Lower, Middle, and Upper School, Bronx, N.Y.

Get ideas for teacher-developed, student-approved STEM design challenges to include in your physical science curriculum on topics such as thermodynamics, motion, and acoustics.

#### Using the 5E Model to Implement the NGSS in the Chemistry Classroom

(Grades 9–12)

Kentia Hall O, Convention Center

Science Focus: PS, SEP6

**Jimmy Ma** ([jimmy.ma82@gmail.com](mailto:jimmy.ma82@gmail.com)), Civic Leadership Academy, Elmhurst, N.Y.

**Anna Annina** ([aannina407@gmail.com](mailto:aannina407@gmail.com)), Williamsburg Preparatory High School, Brooklyn, N.Y.

Engage in several model chemistry lessons that meet the NGSS and use the BSCS 5E instructional model. Much of what will be presented will be the culmination of the work done by Math for America Master Science Teacher Fellows. Attendees will be given sample lesson plans, UbD unit plans, sample learning tasks, and additional resources that are vetted by other science teachers.

### 5:00–6:00 PM Presentation

#### More than Data, Science Is a Story

(Grades 1–12) *Platinum Ballroom Salon H, JW Marriott*

Science Focus: GEN, SEP

**JR Ginex-Orinion**, Tustin (Calif.) Unified School District  
Science is more than numbers. It involves stories in exploration, asking great questions, making claims, and thoughtful reflection. Explore how digital storytelling develops better learners.

#### Space Exploration’s Future and NGSS Engineering Practices Converge

(General) *Platinum Ballroom Salon J, JW Marriott*

Science Focus: ESS, ETS, SEP

**David Seidel** (*david.m.seidel@jpl.nasa.gov*), NASA Jet Propulsion Laboratory, Pasadena, Calif.

Space exploration is no longer “NASA-only.” See how private and commercial space exploration complement NASA and the Engineering, Technology, and Applications of Science disciplinary core idea.



#### 4-H Follow a Researcher™

(General) *502B, Convention Center*

Science Focus: INF, SEP

INF

**Laura Wilson** (*@UMaineFAR; laura.wilson@maine.edu*) and **Gregory Kranich** (*@UMaineFAR; gregory.kranich@maine.edu*), University of Maine Cooperative Extension, Orono

**Sarah Sparks** (*sarah.sparks@maine.edu*), University of Maine Cooperative Extension Androscoggin & Sagadahoc Counties Office, Lisbon Falls

We will share details about 4-H Follow a Researcher and how it provides access through social media to real-time conversations between students, teachers, and university-level researchers.

#### Middle School 3D NGSS in Action!

(Grades 6–8) *506, Convention Center*

Science Focus: GEN, NGSS

**Kari Koch**, Tierra Del Sol Middle School, Lakeside, Calif.

**Brenda Mueller**, De Portola Middle School, San Diego, Calif.

**Jeremiah Potter**, Pacific Beach Middle School, San Diego, Calif.

**Anthony Sandoval**, Parkway Middle School, La Mesa, Calif.

Analyze video for evidence of three-dimensional learning by students in the classroom. The presenters are SDSU Noyce Master Teaching Fellows who use video to inform their implementation of NGSS.

#### Knee-High to a Grasshopper: Nature Discovery Techniques for Young Learners

(Grades P–1) *Kentia Hall A, Convention Center*

Science Focus: LS2.A, LS2.B, LS4.C, CCC1, CCC3, CCC6, SEP1, SEP7, SEP8

**Catherine Terrones** (*cathy.terrones@lacity.org*), Cabrillo Marine Aquarium, San Pedro, Calif.

Activities, ideas, and facilitation techniques for creating nature discovery experiences for young learners. Bring the classroom outside and nature into the classroom.

#### “STREAM” Lining the Elementary Experience Science, Technology, Reading, Engineering, Arts, and Math

(Grades 2–5) *Kentia Hall G, Convention Center*

Science Focus: GEN, NGSS

**Amanda Olford** (*aolford@escambia.k12.fl.us*), Hellen Caro Elementary School, Pensacola, Fla.

Do you want to “STREAM” line your classroom? Then join us with your computer as we share ideas on how to create an interdisciplinary curriculum with science as the star attraction.

#### Explore Free Water Science Activities for Middle School Environmental Classrooms

(Grades 6–9) *Kentia Hall Q, Convention Center*

Science Focus: LS2, CCC7, SEP1

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

**Nanette Marcum-Dietrich** (*@DrNanette; ndietrich@millersville.edu*), Millersville University, Millersville, Pa.

**Jerry Valadez** (*jdvsience@yahoo.com*), NSTA Director, Multicultural/Equity in Science Education, and SAM Academy, Inc., Sanger, Calif.

Explore free web-based watershed-related activities and engineering projects that model the technologies used to clean, conserve, and manage your local water resources.

**5:00–6:00 PM Hands-On Workshops****Puzzling Theories: Teaching Nature of Science in a Biology Classroom**

(Grades 6–College) *Diamond Ballroom Salon 2, JW Marriott*  
Science Focus: LS

**Yaozhen Pan**, Illinois Institute of Technology, Chicago  
Presider: Juan Jimenez (*jjimen10@iit.edu*), Illinois Institute of Technology, Chicago

By putting puzzle pieces together, we are helping students make connections to biology and the nature of science. Lesson plans and activities provided.

**Hands-On STEM Curriculum as a Way to Support Three-Dimensional Learning**

(Grades 8–12) *Diamond Ballroom Salon 7, JW Marriott*  
Science Focus: ESS2.A, ESS2.C, ESS2.D, ESS3.A, ESS3.C, ESS3.D, ETS, LS1, LS2, LS3.B, PS1.A, PS1.B, PS2.C, PS3.B, PS3.D, PS4, CCCC, SEP

**Claudia Ludwig** (*@SystemsEd; cludwig@systemsbiology.org*) and **Jessica Day** (*@SystemsEd; jday@systemsbiology.org*), Institute for Systems Biology, Seattle, Wash.

Explore four free and engaging STEM modules that spiral NGSS disciplinary core ideas, crosscutting concepts, and science and engineering practices in order to have your students truly develop needed understanding and skills.

**Designing a Balanced NGSS Unit Using a Three-Dimensional Planning Organizer**

(Grades 6–12) *Diamond Ballroom Salon 8, JW Marriott*  
Science Focus: GEN, NGSS

**Michele Korb** (*michele.korb@csueastbay.edu*) and **Michelle Sinapuelas** (*michelle.sinapuelas@csueastbay.edu*), California State University, East Bay, Hayward

Learn how to design a balanced NGSS unit with typical science activities and anchoring phenomena using a 3D Next Generation Alliance for Science Educators Toolkit (ASET) planning tool.

**Developing Science Practices: Constructing Explanations and Engaging in Argumentation**

(Grades 6–10) *Diamond Ballroom Salon 9, JW Marriott*  
Science Focus: LS2, CCC2, CCC7, SEP6, SEP7

**Maia Willcox** (*@SEPUP\_UCB; mwillcox@berkeley.edu*), The Lawrence Hall of Science, University of California, Berkeley

**Lauren DeFino** (*definoscience@gmail.com*), Eagle Academy for Young Men, Bronx, N.Y.

Explore how to use scaffolding tools to help students construct NGSS-focused explanations and engage in argument from scientific evidence.

**Project-Based Learning in Science to Reach All Learners**

(Grades 10–11) *Olympic 3, JW Marriott*  
Science Focus: LS, PS, SEP1

**Molly Shabica** (*dedougou@hotmail.com*), Fannie Lou Hamer Freedom High School, Bronx, N.Y.

Project-based science allows all students at all levels to access the concepts and content of physics, chemistry, and biology. Projects that relate to student lives are used at the beginning of a unit to motivate student learning—they're an essential for education and equity for all.

**Two Tools for Observing the NGSS**

(Grades K–12) *Platinum Ballroom Salon G, JW Marriott*  
Science Focus: GEN, NGSS

**Dawn O'Connor** (*@dawn\_oconnor; dawn\_o@acoe.org*), Alameda County Office of Education, Hayward, Calif.

Supporting the NGSS? Come learn to apply two tools developed for observing three-dimensional teaching and learning by observing video-recorded classrooms transitioning to the NGSS.

**NGSS Developing Tools for Three-Dimensional Classroom Assessment**

(Grades 6–12) *515A, Convention Center*  
Science Focus: GEN, NGSS

**Sara Dozier** (*@saradozier*), Stanford University, Stanford, Calif.

Wondering about assessments in the NGSS classroom? Explore how to develop three-dimensional formative assessments and shift current assessments to measure learning progress toward the NGSS.

**Robotics for the K–6 Classroom**

(Grades K–6) *Kentia Hall C, Convention Center*  
Science Focus: ETS, CCC, SEP

**Gina Thackrey** (*@SkylineSTREAM; ginathackrey@sbsd.k12.ca.us*), Solana Beach (Calif.) School District

Get ready to teach robotics by Monday! Attendees build a simple robot. Free and affordable resources for robotics projects and NGSS- and CCSS-focused interdisciplinary units provided.

**Step-by-Step and Frame-by-Frame: Using NGSS-Based Sentence Frames to Encourage Elementary Students to Talk Science**

(Grades 4–5) *Kentia Hall D, Convention Center*  
Science Focus: GEN, NGSS

**Nonye Alozie** (*nonye.alozie@gmail.com*), SRI International, Menlo Park, Calif.

**Eileen Gilligan** (*@EileenGilligan; emgilligan@interact.ccsd.net*), Clark County School District, Las Vegas, Nev.

Work with and develop NGSS-based sentence frames to promote and support all students, especially English language learners, in science language development.

**Discover Three-Dimensional Learning with *The Cat in the Hat Knows A Lot About That*: PBS Kids Multimedia Addresses NGSS**

(Grades P–4) *Kentia Hall E, Convention Center*  
Science Focus: GEN, NGSS

**Sara Sweetman** (*sara\_sweetman@uri.edu*), The University of Rhode Island, Narragansett

Discuss the use of multimedia in education and learn about CPB/PBS Ready to Learn commitment to modeling and engaging children in three-dimensional learning.

**Energizing Science Learning with Thinking Maps!**

(Grades 1–5) *Kentia Hall F, Convention Center*  
Science Focus: PS3, SEP

**Teresa Higgins** (*teresa.higgins@unco.edu*), University of Northern Colorado, Greeley

Energy forms of sound, electricity, and heat are the context for modeling NGSS connections and thinking maps to support science learning in the elementary grades.

**NASA’s Scale of Discovery: Applications from Our Universe**

(Grades K–12) *Kentia Hall P, Convention Center*  
Science Focus: GEN, CCC1, CCC2, CCC3, CCC4, CCC6, SEP

**Barbara Buckner** (*@bbuckner; barbie.buckner@nasa.gov*), NASA Armstrong Flight Research Center, Palmdale, Calif. Explore applications of scale and conversions with hands-on standards-focused STEM activities. Engage our universe as you apply distance, time, and size scales to models.

**Structure to Function: Traditional and Web-Based Exploration of a Rare Disease**

(Grades 9–College) *Kentia Hall S, Convention Center*  
Science Focus: LS1, LS3, CCC6, SEP1, SEP4, SEP6, SEP7, SEP8

**Julie Bokor** (*jbokor@ufl.edu*), University of Florida, Gainesville

Delve into the crosscutting concept structure to function through an inquiry investigation of a rare disease through hands-on activities and virtual environments.

**National Earth Science Teachers Association (NESTA) Shares: Rock, Mineral, and Fossil Raffle**

(General) *Petree Hall D, Convention Center*  
Science Focus: ESS, ETS2, SEP

**Parker Pennington IV** (*p.o.pennington@gmail.com*), Retired Educator, Ann Arbor, Mich.

**Michael Passow** (*michael@earth2class.org*), Dwight Morrow High School, Englewood, N.J.

NESTA offers a chance to win one or more display- and classroom-quality rock, mineral, and fossil specimens, as well as other Earth science–related materials.

**S.Y.S.T.E.M.S.: STEM-izing Youth Scholars Through Technology Engineering Math and Science**

(Grades 3–8) *West Hall B-2, Convention Center*  
Science Focus: GEN, NGSS

**Omar Shepherd** (*@doctorstem; oshpherd@ocde.us*), Orange County Dept. of Education, Costa Mesa, Calif.

**Maureen Allen** (*mallensci@earthlink.net*), Science Consultant, Murrieta, Calif.

The SYSTEMS approach is grounded in Project-Based Learning as a mode of instruction of NGSS for hands-on/minds-on learning and engagement.

**Rubric First: Engineers Start with Contracts Before Making Blueprints**

(Grades K–6) *West Hall B-4, Convention Center*  
Science Focus: ETS1, PS2.A, CCC6, SEP2, SEP3, SEP6

**Ana Appel** (*ana.appel@ascendlearning.org*), Ascend Learning, Brooklyn, N.Y.

Launch a STEM unit with a rubric first approach. Set the foundation for engineering design projects and ensure powerful STEM assessments.

**NGSS@NSTA Session: Finding Phenomenal Instructional Resources for High School Life Science**

(Grades 9–12) *West Hall B-5, Convention Center*  
Science Focus: LS, CCC, SEP6

**Jeremy Peacock** (@jeremy\_peacock; *peacock.jeremy@gmail.com*), Northeast Georgia RESA, Winterville

**Janet Dykstra** (@jcd837; *jcdykstra@comcast.net*), Science Curriculum and Assessment Specialist, Stratham, N.H.

**Gabriela Rose** (*gabriela.rose@aiu3.net*), Allegheny Intermediate Unit 3, Homestead, Pa.

NGSS@NSTA curators will show you firsthand how the vetted resources on the hub can help you engage students in investigating and explaining biological phenomena.

**5:30–6:00 PM Presentation**

**Improving Learning with Science Practices in the Elementary Classroom**

(Grades K–6) *Kentia Hall B, Convention Center*  
Science Focus: PS1.A, SEP

**Steven Hammari** (@CHEMTHUG), Los Banos High School, Los Banos, Calif.

**Julie Hammari** (@hamliej), East Meadows Elementary School, Spanish Fork, Utah

Examples of using science practices in an elementary classroom to improve learning and engagement and to better prepare for secondary sciences and future citizenship.





—Photo courtesy of Columbia Memorial Space Center

At the Columbia Memorial Space Center, you can take a picture with Andy the Astronaut! The replica EVA (extra-vehicular activity) space suit from NASA's Space Shuttle program was specially designed to allow for photographic moments! Enter the spacesuit through its backpack and pose as an astronaut!

### 7:30–8:30 AM Networking Opportunity

#### Life Members' Morning Social

(By Invitation Only)

Olympic 1, JW Marriott

Join NSTA President Mary Gromko for an event dedicated to you, our Life Members. Light refreshments served.

### 8:00–8:30 AM Presentations

#### Modeling in Chemistry: Learn to Walk the Scientific Runway

(Grades 9–12)

304 AB, Convention Center

Science Focus: PS1.A, PS1.B, SEP

**Shannon Etnyre** (@EtnyreSci; [shannon.etnyre@gmail.com](mailto:shannon.etnyre@gmail.com)), Vernon Hills High School, Vernon Hills, Ill.

Join me as I share my experience about how NGSS promoted an infusion of modeling into our chemistry curriculum through traditional and Google Apps for Education (GAPE)–based methods.

#### Financing Green Schools in Low-Income Communities

(Grades K–12)

513, Convention Center

Science Focus: GEN

**Karena Ruggiero**, Earth Day Network, Washington, D.C. Get the details of an innovative funding plan for green school financing to renovate deteriorating school buildings in low-income communities using the Community Reinvestment Act (CRA).

### 8:00–9:00 AM Presentations

#### Leadership Strategies for Ensuring Each Student Has a STEM Future

(Grades P–12)

402A, Convention Center

Science Focus: GEN, SEP

**Bob Sotak** ([bobsotak@gmail.com](mailto:bobsotak@gmail.com)), Science/STEM Education Consultant, Edmonds, Wash.

**Brian Day** ([bday@everettsd.org](mailto:bday@everettsd.org)), Everett (Wash.) Public Schools

Strategies and tools to implement a districtwide K–12 STEM program impacting each student—identifying resources, developing a vision, and measuring progress toward that vision.

#### Awesome Airbags: Exploring the Design Process Through the NGSS Lens

(General)

403A, Convention Center

Science Focus: ES1.B, ETS1.C, PS1.B, CCC2, CCC4, SEP2, SEP3, SEP4, SEP6

**Gypsy Biller** (@science\_rcks; [wrknmom@gmail.com](mailto:wrknmom@gmail.com)), Foothill High School, Santa Ana, Calif.

Explore how to teach an abstract chemistry concept by presenting students with real-life “phenomena” and design challenges that center around NGSS instructional strategies.



#### NSTA Press® Session: *Problem-Based Learning in the Classroom, K–12*

(Grades K–12)

408A, Convention Center

Science Focus: GEN, NGSS

**Tom McConnell** ([tjmccconnell@bsu.edu](mailto:tjmccconnell@bsu.edu)), Ball State University, Muncie, Ind.

**Joyce Parker** ([parker13@msu.edu](mailto:parker13@msu.edu)), Michigan State University, East Lansing

**Jan Eberhardt** ([eberhar3@cns.msu.edu](mailto:eberhar3@cns.msu.edu)), NSTA Press Author, Haslett, Mich.

Experience the power of Problem-Based Learning; meet the authors of a new book series, *Problem-Based Learning in the Classroom, K–12*; and explore the book’s resources.

#### Environmental Science and GIS Geoinquiries

(Grades 6–12)

408B, Convention Center

Science Focus: ESS3, LS2, CCC1, CCC2, CCC7, SEP1, SEP2, SEP4

**Roger Palmer** (@gisetc; [roger.gisetc@gmail.com](mailto:roger.gisetc@gmail.com)), Bishop Dunne Catholic School, Dallas, Tex.

Geoinquiries are short standards-based activities that harness the power of Geographic Information Systems (GIS) to bring map-based concepts commonly used in environmental science and biology textbooks alive. Designed to be used by any teacher, regardless of prior experience with mapping tools, these activities are great to introduce topics and provoke discussions.

**An Authentic Research Experience for Teachers: The NASA/IPAC Teacher Research Program (NITARP)**

(Grades 9–College) 409 AB, Convention Center

Science Focus: ESS1.A, ESS1.B, ESS3.A, PS, CCC, SEP

**Thomas Rutherford**, Sullivan South High School, Kingsport, Tenn.

Find out about NASA/IPAC Teacher Archive Research Program, a yearlong (January to January) program that partners teachers and their students with a NASA astronomer for an authentic astronomy research project using real data from various NASA data archives.

**Sing for the Planet**

(Grades 4–10) 501C, Convention Center

Science Focus: GEN, INF

**Juliana Texley** (@JulianaTexley; [texlej@cmich.edu](mailto:texlej@cmich.edu)), 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant

Begin with a song from Chavez and Seeger in English and Spanish. Then explore award-winning resources from public television (or a free CD) that illustrate how learners confront real-world problems with amazing, empowering results.



**Removing Literacy Barriers to Rigorous STEM Units**

(Grades 6–12) 502A, Convention Center

Science Focus: GEN, SEP

**Amy Baeder**, Baeder Consulting, Heber Springs, Ark.

Do you want your students writing skillfully, using academic language, and accessing more difficult texts? Leave with literacy scaffolding strategies and an implementation plan.



**Coding Curriculum for K–6 Students**

(Grades K–6) 502B, Convention Center

Science Focus: GEN, NGSS

**Christelle Harding** ([charding@dps61.org](mailto:charding@dps61.org)) and **Kamra Meador** ([kamiem@aol.com](mailto:kamiem@aol.com)), Decatur (Ill.) Public Schools

Coding and technology skills may provide opportunities for students to rise from poverty. We will examine processes used to integrate coding into the K–6 curriculum.

**Helping You Integrate STEM with DiscoverE’s Future City Program**

(Grades 6–8) 506, Convention Center

Science Focus: ETS1, SEP1, SEP2, SEP5, SEP8

**John Hutchens** ([johnh@usca.edu](mailto:johnh@usca.edu)), Ruth Patrick Science Education Center, Aiken, S.C.

Discover how this project-based experience can help your students understand the engineering design process and project management. Give your students a real-world experience of doing what an engineer does.

**Engaging Students Beyond the Classroom: Classroom Gardens**

(Grades 5–8)

507, Convention Center

Science Focus: LS, SEP

**Kailin Cornwall**, UC Charter Woodlawn Campus, Chicago, Ill.

Allow students to extend their life science learning beyond the classroom by engaging them in a classroom garden.

**To Build or Not to Build: Using Engineering, GIS, Exploration, and News Articles to Answer the Question**

(Grades 6–12)

510, Convention Center

Science Focus: ESS2.C, ETS, CCC2, CCC4, SEP1, SEP2, SEP6, SEP7, SEP8

**Karen Clark**, Immaculata Catholic School, Durham, N.C.

Using engineering, Geographic Information Systems, lab exploration, and news articles to study beach erosion and solve local coastal problems. Hands-on time with GIS included.

**Radio Astronomy in Your Classroom with NASA’s GAVRT Project**

(Grades 4–12)

511C, Convention Center

Science Focus: ESS

**Shannon McConnell**, NASA Jet Propulsion Laboratory, Pasadena, Calif.

NASA’s Goldstone Apple Valley Radio Telescope Project is an interactive, authentic science collection and data analysis program for students in grades 4–12. Students join in an authentic science experience collecting and analyzing radio astronomy data while remotely operating a 34-meter radio astronomy antenna from their classroom.

**INF HEROES: Helping Educate, Re-energize, and Organize Environmental Stewards**

(Grades P–12)

512, Convention Center

Science Focus: GEN, INF

**Ginger Reasonover** ([ginger.reasonover@lipscomb.edu](mailto:ginger.reasonover@lipscomb.edu)), David Lipscomb Campus, Nashville, Tenn.

Learn to integrate STEM and service learning through projects that will have an impact on students’ community and world through their engagement with our environment.



**NGSS Creating Life Science Assessment Tasks That Integrate Three-Dimensional Learning of the NGSS**

(Grades 5–12) 515A, Convention Center

Science Focus: LS, CCC, SEP

**Phyllis Haugabook Pennock** (*phyllispennock@gmail.com*) and **Jane Lee** (*leejanej@msu.edu*), CREATE for STEM Institute, Michigan State University, East Lansing  
**Nonye Alozie** (*nonye.alozie@gmail.com*), SRI International, Menlo Park, Calif.

**Sania Zahra Zaidi** (*@sania-zaidi; sania@uic.edu*), The University of Illinois at Chicago

Explore the development and use of life science formative assessments that integrate the three dimensions of the NGSS to inform student progress in the classroom.



**8:00–9:00 AM Hands-On Workshops**

**Teachers Leading Teachers: Using Protocols to Support Collaboration Around NGSS Implementation**

(Grades P–12) 301 AB, Convention Center

Science Focus: GEN, NGSS

**Steven McGee** (*@lponline\_mcgee; mcgee@lponline.net*) and **Maggie Augustinsky**, Northwestern University, Evanston, Ill.

**Kyla Cook** (*kcook@fieldmuseum.org*), The Field Museum, Chicago, Ill.

**Abigail Dye**, Peggy Notebaert Nature Museum, Chicago, Ill.

Learn how preK–3 teacher leaders in Chicago are using protocols to lead peers in transforming science teaching at their school to meet the NGSS.

**Discovering and Measuring Earth’s Layered Interior: A Three-Dimensional Learning Activity from IRIS**

(Grades 7–College) 306 AB, Convention Center

Science Focus: ESS2.A, ESS2.B, CCC1, CCC3, SEP2, SEP4, SEP7

**Michael Hubenthal** (*@IRIS\_EPO; michael.hubenthal@iris.edu*) and **John Taber** (*taber@iris.edu*), IRIS, Washington, D.C.

Using math, building models, analyzing earthquake data, and participating in scientific discourse can lead your students to discover and measure Earth’s outer core!

**NGSS Physical Science Fun and Inquiry Across the Grade Bands**

(Grades 1–12) 308 AB, Convention Center

Science Focus: PS

**Wayne Snyder** (*wsnyder@caltech.edu*), Cal Poly Pomona, Calif.

**Karen Ostlund** (*@karen\_ostlund; klostlund@utexas.edu*), 2012–2013 NSTA President, and The University of Texas at Austin

Join the fun and inquiry as we apply a variety of hands-on activities to different grade levels, from elementary to middle school to high school.

**The Three Dimensions of the Bad Seed**

(Grades K–12) 309, Convention Center

Science Focus: LS1, SEP1

**Anna Newman** (*@anewman@SPFII; anewman@acoe.org*) and **Dawn O’Connor** (*dawno@acoe.org*), Alameda County Office of Education, Hayward, Calif.

The phenomenal Bad Seed presentation uses the lens of structure and function to engage participants in questioning and discourse. Engage in a hands-on activity around the amazing phenomenon of the Filaree seed. Materials will be dispersed to participants.

**Exploring Visible and Infrared Light and Energy in a Three-Dimensional Learning Setting**

(Grades 9–12) 404 AB, Convention Center

Science Focus: PS3.A, PS4.A, CCC, SEP

**Pamela Harman** and **Coral Clark**, SETI Institute, Mountain View, Calif.

Practice lessons with simple classroom technology that explore the EM Spectrum detection and explanatory models; and that illustrate real-world applications in space science.

**Biophilia and Its Impact on Academic Achievement, Retention, and Intrinsic Motivation in the Middle School Classroom**

(Grades 6–8) 405, Convention Center  
Science Focus: LS

**Kimberly Conner** ([kimberly.conner@wartburg.edu](mailto:kimberly.conner@wartburg.edu)) and **Clay Waterbury** ([clayh2obury@gmail.com](mailto:clayh2obury@gmail.com)), Wartburg College, Waverly, Iowa

We will be looking at how using animals in the classroom can increase students' long-term concept retention and self-efficacy.

**Epidemiology as the Next “Forensic Science” Capstone Course**

(Grades 6–12) 406 AB, Convention Center  
Science Focus: GEN

**Terrence Grant**, The Catholic High School of Baltimore, Md.

Come find out how epidemiology can be an exciting capstone science course in the same way that forensic science captured student imaginations.

**Fighting Breast Cancer and Diabetes with STEM**

(Grades 8–College) 410, Convention Center  
Science Focus: LS

**Jeffrey Lukens** ([jeffreylukens0613@gmail.com](mailto:jeffreylukens0613@gmail.com)), Sioux Falls (S.Dak.) School District

What once was “pie in the sky” is becoming more real by the day. Strides are being made in the treatment and cure of both breast cancer and Type 1 diabetes. Help your students become modern-day heroes in this fight.

**Beyond the CDC Hot Zone (Centers for Disease Control and Prevention)**

(Grades 7–College) 501 AB, Convention Center  
Science Focus: GEN, NGSS

**Kelly Cordeira** ([scienceambassador@cdc.gov](mailto:scienceambassador@cdc.gov)) and **Andrew Fisher** ([scienceambassador@cdc.gov](mailto:scienceambassador@cdc.gov)), Centers for Disease Control and Prevention, Atlanta, Ga.

More goes on at CDC than just working the Hot Zone. CDC staff will demonstrate data-generating laboratory activities that add excitement and interaction to classrooms.

**Weather Watchers Using Models, Maps, and Data**

(Grades 6–8) 503, Convention Center  
Science Focus: ESS2.D

**Jan Robertson** ([@RobertsonjJan](mailto:@RobertsonjJan); [robertsonj@mdusd.org](mailto:robertsonj@mdusd.org)), Mt. Diablo Unified School District, Concord, Calif.

Participants will be invited to “shift” their thinking by incorporating Project-Based Learning, NGSS, and CCSS while engaging in hands-on experiences using weather models, maps, and data.

**NESTA and HHMI Share: Welcome to the Anthropocene: Teaching Resources for a New Epoch**

(Grades K–12) 511 AB, Convention Center  
Science Focus: ESS3

**Carla McAuliffe** ([carla\\_mcauliffe@terc.edu](mailto:carla_mcauliffe@terc.edu)), TERC, Cambridge, Mass.

**Mark Nielsen** ([nielsenm@hhmi.org](mailto:nielsenm@hhmi.org)), Howard Hughes Medical Institute, Chevy Chase, Md.

This workshop will present the latest research on the topic of a proposed new geologic epoch, the Anthropocene, highlighting free ready-to-use NGSS-congruent classroom resources for teaching about human impact on planet Earth.

**The Science Practices Hands On: Exploring the Science Practices from the NGSS**

(Grades K–5) Kentia Hall B, Convention Center  
Science Focus: GEN, SEP

**Patrick Dowd** ([pdowd@exploratorium.edu](mailto:pdowd@exploratorium.edu)), Exploratorium, San Francisco, Calif.

Join the Institute for Inquiry and engage in doing science practices as part of a series of hands-on activities. A discussion about new insights into the science practices follows.

**Get Caught Up in Our Science Web!**

(Grades P–2) Kentia Hall C, Convention Center  
Science Focus: ESS3, LS4, CCC

**Jennifer Hope** ([jmghope@gmail.com](mailto:jmghope@gmail.com)), McKendree University, Lebanon, Ill.

**Julie Stanglein** ([jstanglein@zionharvester.org](mailto:jstanglein@zionharvester.org)), Zion Lutheran School, Saint Charles, Mo.

Fascination with nature is a springboard into science learning. Use a simple tool and community resources to plan a multidisciplinary study for young learners.

**Young Children Investigate and Engineer Sound Through STEM**

*(Grades P–2)* Kentia Hall E, Convention Center  
 Science Focus: PS4.A

**Akiko (Sonia) Yoshizawa** (@Yuki\_Eve), East Tennessee State University, Johnson City

Hear stories, view a video of children engaging in the materials, and actively engage with materials yourself to discuss how children can engage with the physics of sound.

**Ambitious Modeling in the Elementary Classroom**

*(Grades P–5)* Kentia Hall F, Convention Center  
 Science Focus: GEN, SEP2, SEP8

**Michelle Salgado** (@SalgadoScience; *msalgado@uw.edu*) and **Karin Lohwasser** (*loh2o@uw.edu*), University of Washington, Seattle

**Kaia Tomokiyo** (@kindercolors\_k; *kaia.tomokiyo@highlineschools.org*), Highline Public Schools, Seattle, Wash. Receive an overview of the modeling process, and sense-making talk that supports NGSS and the Ambitious Science Teaching Framework within the elementary classroom.

**What’s a “CER” and Why Do I Need One?**

*(Grades 4–8)* Kentia Hall H, Convention Center  
 Science Focus: GEN, SEP7

**Nancy Gifford** (@capenancy; *ngiffordscience@gmail.com*), Monomoy Regional Middle School, Chatham, Mass.

**Annie Haven** (*anniebassetthaven@gmail.com*), Cape Cod Lighthouse Charter School, East Harwich, Mass.

Come learn how to create standards-based Claim, Evidence, and Reasoning assignments with your students. We will share strategies for student success, as well as exemplars and rubrics.

**The Interactive Science Notebook: The Role of Documentation in Knowledge Construction and the Assessment of Learning**

*(Grades 5–8)* Kentia Hall J, Convention Center  
 Science Focus: GEN, NGSS

**Kerry Dixon**, Education Consultant, Granville, Ohio

Learn to create engaging Interactive Science Notebooks for your middle school or high school students! Special focus given to assessing student learning in engineering design challenges.

**Integrating Digital Games into Instruction to Address Crosscutting Concepts**

*(Grades 6–8)* Kentia Hall M, Convention Center  
 Science Focus: GEN, CCC

**Wendy Martin**, Education Development Center, Inc., Waltham, Mass.

Digital games have been touted as a way to cultivate student engagement in learning. But when used as an integral part of instruction, they can support three-dimensional learning. Learn about digital games for middle grade science that target persistent misconceptions.

**Integrating Literacy and Technology into a Geology Unit Using a Conceptual Story Line**

*(Grades 5–8)* Kentia Hall N, Convention Center  
 Science Focus: ESS, CCC, SEP

**Donna Barrett**, Fulton County Schools, Atlanta, Ga.

Plate tectonics, boundaries, and mountain formation come together in a unit integrating literacy (CER) and technology through a conceptual storyline.

**8:30–9:00 AM Presentation**

**Arguments in Chemistry Can Be a Good Thing!**

*(Grades 9–12)* 304 AB, Convention Center  
 Science Focus: PS, SEP1, SEP3, SEP4, SEP7, SEP8

**Nicole Chapman**, Coretta Scott King Young Women’s Leadership Academy, Atlanta, Ga.

Do you want to do an Argument-Driven Inquiry (ADI) in your high school chemistry classroom but need some strategies? This presentation is for you. Learn strategies, techniques, differentiated instruction strategies, and more to do an ADI with ease. Handouts!

**9:30–10:00 AM Presentations**

**STEM, PBL, and the Engineering Design Process**

*(Grades 6–8)* 408B, Convention Center  
 Science Focus: ETS1, SEP

**Nicole DeShazer**, Santa Ana (Calif.) Unified School District

Explores how the Engineering Design Process can replace scientific investigations, in the context of STEM and Project-Based Learning, when our students are confronted with problems.



### **Differentiating for the Differentiated: Lab Experiences for General Level Life Science Students**

(Grades 7–12) 502B, Convention Center  
Science Focus: LS

**Corey Mullins** (@BioTeachMullins; coreymullins@foresthills.edu), Turpin High School, Cincinnati, Ohio

Attention will be paid to strategies to make lab time successful and productive for the diverse learners in a general life science class.

### **NGSS EQUiP Rubric: A Formative Assessment Tool in Creating NGSS Lessons**

(Grades 7–College) 515A, Convention Center  
Science Focus: GEN, NGSS

**Comfort Ateh** (cateh@providence.edu), Providence College, Lincoln, R.I.

We will share an NGSS-aligned lesson created with the aid of the EQUiP rubric and students' responses to sample assessment tasks.



### **Using 3D Printers in Your Science Classroom**

(Grades 6–12) 515B, Convention Center  
Science Focus: GEN, SEP2, SEP5, SEP6

**Jessica Guccione** (@msguccione; jessguccione@gmail.com), Venado Middle School, Irvine, Calif.

Discover the ways in which a 3D printer can help you implement the NGSS science and engineering practices. Tips and lessons plans will be shared!



### **9:30–10:30 AM Presentations**

#### **NESTA and CZO Share: The Critical Zone (CZ): Where Rock Meets Life and the NGSS Meets Your Class!**

(Grades 4–College) 309, Convention Center  
Science Focus: ESS, CCC, SEP

**Don Duggan-Haas** (@dugganhaas; dugganhaas@gmail.com), Paleontological Research Institution, Ithaca, N.Y.

Interdisciplinary teams of scientists are studying the interplay of Earth and life at observatories around the country. How can you connect your classroom? Visit [criticalzone.org](http://criticalzone.org).

#### **Focusing on Physical Science Classes: Creating a Pipeline for Interest in STEM-Related Classes for Females and Underrepresented Minorities**

(General) 403A, Convention Center  
Science Focus: PS, CCC, SEP

**Rabieh Hafza**, Atlanta (Ga.) Public Schools

Emphasis will be placed on strategies to recruit and retain females and underrepresented minorities in STEM-related classes as they matriculate.

#### **Connecting STEM to Threats from New and Emerging Diseases**

(Grades 3–12) 501 AB, Convention Center  
Science Focus: LS1, LS2, CCC1, CCC7, SEP2, SEP4

**Greg Vogt, Barbara Tharp** (btharp@bcm.edu), **Christopher Burnett** (@tophb; caburnet@bcm.edu), and **Nancy Moreno** (nmoreno@bcm.edu), Baylor College of Medicine, Houston, Tex.

The tools of STEM are the frontline defense against infectious diseases. Explore new instructional lessons focused on real-world investigations of HIV/AIDS and EHEC.

#### **Which Professional Development Improves AP Scores?**

(Grades 9–12) 501C, Convention Center  
Science Focus: GEN

**Arthur Eisenkraft**, 2000–2001 NSTA President, and UMass Boston, Mass.

Research on professional development can help us choose ones that are most effective at increasing student achievement. Review findings from our study of choices that teachers make when faced with major curriculum changes, such as the AP Redesign and the impact of those choices.



**Where Will Yoni the Chickadee Raise His Family?**

(Grades 6–8) 502A, Convention Center  
 Science Focus: LS2, SEP3, SEP4, SEP5, SEP6, SEP7, SEP8  
**Stuart Fleischer** ([sfleischer@wbais.net](mailto:sfleischer@wbais.net)), Walworth Barbour American International School in Israel, Even Yehuda  
 Have your middle school students designing and constructing novel nest boxes to frustrate invasive avian raiders. Get the details about the citizen science GAIA Project.

**Science Teaching Network: How the Peggy Notebaert Nature Museum Uses Teams of Teachers, “Action Research Lite,” and an Inquiry-Based Curriculum to Improve Science Instruction in High-Needs Chicago Public Schools**

(Grades K–8) 506, Convention Center  
 Science Focus: GEN, NGSS  
**Shannon Phillips**, Chicago Academy of Sciences, Chicago, Ill.  
 Learn about the methods used to support teacher implementation of best practice in science education. Discover how we evaluate our programs and the effects on teachers.

**Communications in STEM**

(Grades 5–10) 507, Convention Center  
 Science Focus: GEN  
**Donna Neutze**, Johns Hopkins Center for Talented Youth, Baltimore, Md.  
 Hear how listening, speaking, reading, and writing skills are incorporated into different daily STEM topics. Practice various procedural writing strategies by doing short writing exercises.

**NGSS Meets NASA: Fearless Engineering for All Students**

(Grades K–12) 510, Convention Center  
 Science Focus: ESS3, ETS  
**Ota Lutz** ([ota.l.lutz@jpl.nasa.gov](mailto:ota.l.lutz@jpl.nasa.gov)), NASA Jet Propulsion Laboratory, Pasadena, Calif.  
 Get new engineering lessons for every grade level with individual tailored professional development videos for you to learn how engineering happens every day at NASA.

**Citizen Science Ecosystem Biodiversity in the U.S. and Abroad (with Lemurs!)**

(Grades 7–12) 511C, Convention Center  
 Science Focus: LS2, INF, CCC, SEP  
**Beth Guzzetta** ([@bethguzzetta](mailto:@bethguzzetta); [bguzzetta@allendalecolumbia.org](mailto:bguzzetta@allendalecolumbia.org)) and **Kate Bjorklund**, Allendale Columbia School, Rochester, N.Y.  
**Katie Guzzetta**, Hamilton College, Clinton, N.Y.  
 Explore ecosystem biodiversity with your students through a citizen science project using cubes and DNA, as we did on campus and in Madagascar with grades 7–12 students.

**Energy Literacy: Intentional Resource Connections in a Changing Landscape**

(Grades 5–College) 512, Convention Center  
 Science Focus: ETS2, LS2, PS3  
**Justin Hougham** ([@uphamwoods1941](mailto:@uphamwoods1941); [justin.hougham@ces.uwex.edu](mailto:justin.hougham@ces.uwex.edu)), University of Wisconsin-Extension, Madison  
**Sarah Burgess** ([@sarahtheburgess](mailto:@sarahtheburgess); [sburgess7@gmail.com](mailto:sburgess7@gmail.com)), The Irvine Ranch Outdoor Education Center, Orange, Calif.  
 Use digital technologies and online resources to engage students in energy literacy and future career pathways as an intentional outcome of cutting-edge research projects.

**SOFIA Airborne Astronomy**

(Grades 4–10) 513, Convention Center  
 Science Focus: ESS1.A, ESS1.B, PS4  
**Wendi Rodriguez** ([wendi\\_rodriguez@snowlineschools.com](mailto:wendi_rodriguez@snowlineschools.com)), Snowline Joint Unified School District, Phelan, Calif.  
**Lisa Wininger** ([lwininger@plainwellschools.org](mailto:lwininger@plainwellschools.org)), Plainwell Middle School, Plainwell, Mich.  
**Monique Perez** ([meaguirre-perez@palmdalesd.org](mailto:meaguirre-perez@palmdalesd.org)), Palmdale Learning Plaza, Palmdale, Calif.  
**Susan Oltman** ([@sueatsea](mailto:@sueatsea); [soltman@mountvernonschool.org](mailto:soltman@mountvernonschool.org)), Mount Vernon Presbyterian School, Atlanta, Ga.  
**Ginger DeVillers** ([v.l.devillers@gmail.com](mailto:v.l.devillers@gmail.com)), West Michigan Flight Academy, Grand Rapids  
**Marie Thornsberry** ([mariescupoftea@aol.com](mailto:mariescupoftea@aol.com)), Rialto (Calif.) Unified School District  
**Eileen Grzybowski** ([eileeng@norman.k12.ok.us](mailto:eileeng@norman.k12.ok.us)), Norman North High School, Norman, Okla.  
 SOFIA stands for the Stratospheric Observatory for Infrared Astronomy. Join 10 NASA Airborne Astronomy Ambassadors as they present how to incorporate infrared astronomy in the STEM classroom.



### Magnetics

(Grades P–5) *Kentia Hall B, Convention Center*

Science Focus: PS

**Carlos Villa** ([villa@magnet.fsu.edu](mailto:villa@magnet.fsu.edu)), National High Magnetic Field Laboratory, Tallahassee, Fla.

Hear how National High Magnetic Field Laboratory educators are using inquiry activities to teach the topics of magnets and magnetism. You're guaranteed one new idea using magnets for your classroom!

### The Making of a Makerspace

(Grades K–5) *Kentia Hall C, Convention Center*

Science Focus: ETS, CCC, SEP

**Susan Bartol** ([sbartol@montclair.k12.nj.us](mailto:sbartol@montclair.k12.nj.us)), Hillside Elementary School, Montclair, N.J.

What does it take to make a successful makerspace for elementary learners? We will address the pieces: parental support, fund-raising, programming, professional development, and more.

### How Spatial Reasoning Engages Diverse Learners in Mathematical Understanding and Equips Them for STEM Pursuits

(Grades 3–9) *Kentia Hall H, Convention Center*

Science Focus: GEN, NGSS

**Gina Cherkowski** ([@gcherkowski](https://twitter.com/gcherkowski); [@learningstem](https://twitter.com/learningstem); [gina@stemlearninglab.com](mailto:gina@stemlearninglab.com)), STEM Learning Lab, Calgary, Alta., Canada

In my research, I have found that using spatial reasoning enables diverse learners to learn math conceptually, increases their mathematical performance, and equips them for STEM.

### 9:30–10:30 AM Hands-On Workshops Communicating Biodiversity Science to High School Students

(Grades 9–12) *301 AB, Convention Center*

Science Focus: LS4.B, LS4.D

**Kari Harris** ([@ARBioColl](https://twitter.com/ARBioColl); [kharris@astate.edu](mailto:kharris@astate.edu)) and **Jill Czerwonky** ([jczerwonky@astate.edu](mailto:jczerwonky@astate.edu)), Arkansas State University, Jonesboro

Engage in a specimen-based lesson plan integrating state standards and NGSS. Developed for Southeast Regional Network of Expertise and Collections (SERNEC), this lesson uses Notes from Nature and natural history collections to meet state biology standards. Bring your tablet/laptop.

### Penguins and Polar Bears: Bring Polar Science to Your Classroom

(Grades 4–10) *304 AB, Convention Center*

Science Focus: GEN, CCC

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

Global ice conditions are changing; penguins and polar bears must, too. Hands-on inquiry-, problem-, and NGSS-based activities connect your students to these global problems.

### NASA Data for One, NASA Data for All! Use MY NASA DATA in Your Classroom from K–12 for All Your Earth Science Data Needs

(Grades K–12) *308 AB, Convention Center*

Science Focus: ESS, ETS1, PS3, CCC1, CCC2, CCC3, CCC4, CCC5, CCC7, SEP

**Preston Lewis**, NASA Langley Research Center, Hampton, Va.

Use the MY NASA DATA to access data that will help you better understand the world around you. From your backyard to areas unknown, we have the Earth science data for you! Hands on.

### Grocery Store Chemistry

(Grades 9–12) *404 AB, Convention Center*

Science Focus: PS, SEP2, SEP3, SEP6

**Elise Longley** ([elongley@iltexas.org](mailto:elongley@iltexas.org)) and **Melissa Gomez** ([smgomez@live.com](mailto:smgomez@live.com)), International Leadership of Texas, Garland

Join in for an action-packed workshop devoted to teachers working in underfunded schools. The amount of advanced technology available for science education is astonishing. However, what happens when your school cannot afford it? Come learn how we have creatively crafted our lab activities using everyday grocery store items.

**Team Science: Biodiversity, Population Genetics, and Interdependence in the 21st-Century Classroom**

(Grades 5–12) 405, Convention Center

Science Focus: ESS3, LS4

**Wendy Comer** (*wendyc@wcs.edu*), Crockett Elementary School, Brentwood, Tenn.

**Megan Comer** (*megan.comer@wcs.edu*), Fred J. Page High School, Franklin, Tenn.

Jump into a real-world 21st-century hands-on session geared toward grades 5–12. Leave with classroom materials, scaffolding ideas, and knowledge!

**iPhone, Microscope, and Instagram in Science Class**

(Grades 8–12) 406 AB, Convention Center

Science Focus: LS1.A, LS1.B, LS2.A, LS2.B, LS2.C, LS4, SEP1, SEP3, SEP4, SEP8

**Evelyn Alexander** (*@ScienceinNYC; ealexander@pcs-nyc.org*), Professional Children’s School, New York, N.Y.

Build your own microscope stand, take pictures and videos of microorganisms, as well as reach out to scientists all over the world via Instagram.



**NSTA Press® Session: Helping Your Students (and You!) Achieve Basic Data Literacy**

(Grades 6–College) 408A, Convention Center

Science Focus: GEN, SEP4, SEP5, SEP6, SEP7

**Tony Bartley** (*abartley@lakeheadu.ca*), Lakehead University, Thunder Bay, Ont., Canada

**G. Michael Bowen** (*gmbowen@yahoo.com*), NSTA Director, District XVIII, and Mount Saint Vincent University, Halifax, N.S., Canada

Discover data collecting/analysis techniques to help students young and old to learn the relationships between types of data and analysis of it.

**Using Lionfish to Teach About Invasive Species**

(Grades 5–12) 410, Convention Center

Science Focus: LS2.A, LS2.C, LS4.D, CCC2, CCC3, CCC5, CCC6, SEP4

**Jennifer Latour** (*@latourjen; jlatour@disl.org*), Dauphin Island Sea Lab, Dauphin Island, Ala.

Come discover hands-on activities, including the Lionfish Invasion! board game, stomach contents dissection simulation, and invasion mapping activity to teach your students about invasive species.

**3...2...1...Blast Off with Rocketry**

(Grades 3–12) 503, Convention Center

Science Focus: ETS

**Jennifer Cheesman** (*@azspacecampgirl; jcheesman@pusd11.net*), Zuni Hills Elementary School, Sun City, Ariz.

Create and launch two different types of rockets using simple, inexpensive materials found in your classroom. You don’t have to be a rocket scientist to attend this fun workshop.

**Tides Around the World**

(Grades 5–8) 511 AB, Convention Center

Science Focus: ESS2.C, CCC1, SEP4, SEP5, SEP8

**Mena Parmar** (*@MenaParmar*) and **Dawn O’Connor** (*@dawn\_o\_connor; dawno@acoe.org*), Alameda County Office of Education, Hayward, Calif.

**Jeffery Seitz** (*jeff.seitz@csueastbay.edu*), California State University, East Bay, Hayward

Explore the origin of tides using large data sets to observe tidal patterns and explain the causes of tidal effects around the world.

**Journey to El Yunque: Investigating the Effects of Hurricane Disturbance in Puerto Rico by Synthesizing Texts and Long-Term Data**

(Grades 6–8) 514, Convention Center

Science Focus: LS2.A, LS2.C, CCC4, CCC7, SEP2, SEP4, SEP8

**Steven McGee** (*@lponline\_mcgee; mcgee@lponline.net*), Northwestern University, Evanston, Ill.

Support students as they synthesize life history textual information and long-term species data to explain trends in population dynamics after a hurricane disturbance in Puerto Rico.

**Creating a Coding Culture in the Classroom**

(Grades P–6) Kentia Hall E, Convention Center

Science Focus: GEN, NGSS

**Byron Gilliland** (*@byron\_gilliland; byron.gilliland@winona.k12.mn.us*), Jefferson Elementary STEM School, Winona, Minn.

Discover ways to create a culture inclusive to coding in the classroom. Explore methods to create excitement and engage preK–6 students in coding/programming activities.

**UTeach Boston: Teaching and Learning Together to Support the Three Dimensions in Science**

(Grades 3–8, College) *Kentia Hall G, Convention Center*  
Science Focus: GEN, NGSS

**Katheryn Shannon**, UMass Boston, Dorchester, Mass. Experience elementary and middle school lessons developed by teachers, university faculty, and students in the UTeach Boston program and join our conversations about three-dimensional learning.

**I See the Light! An Introduction to Basic Properties of Light**

(Grades K–8) *Kentia Hall J, Convention Center*  
Science Focus: PS

**Mike McKee** (*mmckee@creol.ucf.edu*), University of Central Florida, Orlando

Our simple and fun lessons teach light-based concepts that meet the NGSS—they're hands on, inquiry based, and include free materials, posters, and DVDs.

**Lights, Camera, [STEM] Action!**

(Grades 4–12) *Kentia Hall L, Convention Center*  
Science Focus: ETS2, SEP1, SEP2, SEP3, SEP4, SEP5

**Kate Degner**, St. Ambrose University, Davenport Help students use STEM skills to plan, shoot, and produce short, time-lapse films. Make time-lapse films to slow time to show Newton's laws or speed up time to show a long-term product build. Combine STEM skills to help explain some of Earth's small and not-so-small phenomena! Sorry, director's chairs not included.

**STEM-ulating Simulations**

(Grades 5–8) *Kentia Hall M, Convention Center*  
Science Focus: ETS, LS, PS, CCC

**Cynthia Rounds** (@roundscience; *roundscience@gmail.com*), Robert C. Fisler School, Fullerton, Calif.

Investigate how to use simulations to support the NGSS through a STEM-centered approach. Enhance science learning with research-based online inquiry lab simulations.

**Too Much? Too Little? Just Right!**

(Grades 5–8) *Kentia Hall N, Convention Center*  
Science Focus: GEN

**DeAnn Tenhunfeld** (@LearnAboutAg; *deann@learn-aboutag.org*), California Foundation for Agriculture in the Classroom, Sacramento

California Foundation for Agriculture in the Classroom will present lessons and hands-on activities from their Plant Nutrients curriculum. Geared toward grades 5–8, participants will leave with free resources and ideas to take back to their classrooms.

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**10:00–10:30 AM Presentations**



**STEM for ALL: Dream IT, Design IT, Develop IT**

(Grades 9–12) *502B, Convention Center*  
Science Focus: ETS, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6,

**Hyunjin Son** (*hyunjin\_son@gwinnett.k12.ga.us*) and **Sarah Eales** (*seeales@gmail.com*), Peachtree Ridge High School, Suwanee, Ga.

Through our newly constructed makerspace, D3 Lab, we are transforming the face of public education for all students using a fresh approach to STEM education.



**Using 3D Printers in K–3 to Boost Student Engagement and Learning**

(Grades K–3) *515B, Convention Center*  
Science Focus: ETS, SEP2, SEP5, SEP6

**Ryan Erickson**, Cedar Park Elementary STEM School, Apple Valley, Minn.

3D printing has become synonymous with the maker movement. Find out how to authentically integrate 3D printing technology in our youngest K–3 classrooms.



### 11:00–11:30 AM Presentations

#### Using Google Earth to Teach Earth Science

(Grades 3–12) 501 AB, Convention Center

Science Focus: ESS, SEP2

**Wendy E. Van Norden** (*wvannorden@hw.com*), Harvard-Westlake Upper School, Studio City, Calif.

We will demonstrate Google Earth techniques. Examples of Earth Science exercises using GE will be highlighted.



#### Growing a Garden of Science and Literacy

(Grades P–3) 502A, Convention Center

Science Focus: LS, CCC, SEP

**Michelle Fleming** (*michelle.fleming@wright.edu*), **Kaylee Reese** (*reese.66@wright.edu*), **Colleen Saxen** (*colleen@saxen@gmail.com*), **Kristi Elliott**, and **Danielle Hardin** (*hardin.53@wright.edu*), Wright State University, Dayton, Ohio

**Mary Linzmeier** (*linzmeier.mary@oakwoodschoools.org*), Oakwood (Ohio) City Schools

Join us to learn interactive science notebook methods and activities bridging NGSS with early childhood literacy. Insights and reflections from various perspectives will be shared.

#### Can Students Learn Argumentation by Playing Video Games with Mentors Online?

(Grades 6–8) 506, Convention Center

Science Focus: GEN, CCC, SEP7

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

Yes! Find out how to leverage games and mentors to build a rich environment for scientific inquiry, scientific talk, and scientific argumentation for middle school students.

#### The Teacher Institute for Evolutionary Science (TIES)

(Grades 6–College) 513, Convention Center

Science Focus: LS4

**Nicoline Chambers** (*chambers.nikki@tusd.org*), West High School, Torrance, Calif.

TIES seeks teachers who wish to be leaders in the districts. Work with us in providing effective evolution education and resources for middle school teachers.

#### Strategizing Classroom Talk to Enhance Learning in Elementary Science

(Grades 1–6) Kentia Hall C, Convention Center

Science Focus: LS4, CCC6, SEP1, SEP7

**Caroline Ho** (*caroline\_ho@moe.gov.sg*), English Language Institute of Singapore

**Anne Wong** (*anne\_wong@moe.gov.sg*), Academy of Singapore Teachers

**Suhaizan Talib** (*suhaizan\_talib@moe.edu.sg*), Townsville Primary School, Singapore

**Alan Lim Kok Min** (*lim\_kok\_min\_alan@moe.edu.sg*), Sengkang Green Primary School, Singapore

We will examine how Singapore teachers strategize and mediate classroom talk and knowledge construction with specific “talk moves” that support student learning.

### 11:00 AM–12 Noon Presentations

#### Polymers: Update Traditional Labs and Demos to Match the NGSS

(Grades 5–12) 309, Convention Center

Science Focus: ETS, CCC1, CCC2, CCC3, CCC4, CCC6, CCC7, SEP

**Andrew Nydam** (*andrewnydam@hotmail.com*), Polymer Ambassador, Olympia, Wash.

Enhance and deepen science and math concepts taught in traditionally “fun” polymer labs. Add more scientific processes to make them inquiry based. Take home a CD of information.

#### Raise the Rigor for All and Eliminate the Matthew Effect

(Grades 3–College) 402A, Convention Center

Science Focus: GEN

**Kimberly Williams** (*kwill126@utm.edu*) and **Karen DiBella** (*@ksdibella; kdibella@utm.edu*), The University of Tennessee at Martin

Raise rigor for all students in your classroom using higher-order questions. Transform your instructional practices using Webb’s Depth of Knowledge (DOK) as motivation for change.

### Exploring the Chemistry Between Science and ELA

(Grades 3–10) 403A, Convention Center

Science Focus: GEN, SEP7, SEP8

**Erin Dunroe** (@dunroe\_erin; *erind13@me.com*), Lake Center Middle School, Santa Fe Springs, Calif.

Find out how it is possible to integrate science into each of the *Common Core State Standards* with the help of technology.

### Bringing Biodiversity into the Classroom: Natural History Collections-Based Resources for High School Educators and Learners

(Grades 9–12) 405, Convention Center

Science Focus: LS2, LS4

**Molly Phillips** (@iDigBio; *mphillips@flmnh.ufl.edu*), Florida Museum of Natural History, Gainesville

**Tracy Barbaro** (@eol; *tbarbaro@eol.org*), Encyclopedia of Life, Cambridge, Mass.

**Elizabeth Ellwood** (@libbyellwood; *eellwood@bio.fsu.edu*), Florida State University, Tallahassee

**Anne Basham** (@ExplorMorLabs; *explormorlabs@gmail.com*), Arizona State University, Tempe

**Andrea Miller** (*amiller@mortonarb.org*), Morton Arboretum, Lisle, Ill.

**Kari Harris** (@ARBioColl; *kharris@astate.edu*), Arkansas State University, Jonesboro

We will present short demonstrations of curricula and other STEM resources from six natural history collections-based projects or institutions from around the country.

### INF Using a STEM Club to Promote STEM Schoolwide

(Grades 7–12) 408B, Convention Center

Science Focus: INF, SEP8

**Lauren Petersen** (*lauren.petersen@sweetwaterschools.org*), Montgomery High School, San Diego, Calif.

A model of a successful STEM club will be explained, such as how to get funds, recruit members, and hold a community STEM Night.

### Mem Art: Images That Help SPED Students Retain Science Concepts!

(Grades 5–8) 502B, Convention Center

Science Focus: GEN

**Stacey Sneed** (@SneedStacey; *science.sneed@gmail.com*), Mem Art, Lubbock, Tex.

Mem Art (Memory Art) is beneficial to all students, but it particularly helps those with learning disabilities and English language learners. It also can be used during the science STAAR test!

### Sustainability in the STEM Classroom

(Grades 5–9)

507, Convention Center

Science Focus: GEN, SEP

**Robert McGehee**, Walton Sustainability Solutions Initiatives, Tempe, Ariz.

Sustainability is an interdisciplinary science that can be easily incorporated into any STEM classroom. I'll share three of our Sustainability Science lessons for use in the STEM classroom, focusing on food systems, analyzing complex sustainability problems, and urban sustainable development.

### Mastery Notebooks: Reflective Writing for Internalizing Ideas

(Grades 6–12)

510, Convention Center

Science Focus: GEN, SEP8

**Laura Wang** (*laura.cragin.wang@gmail.com*) and **Michael Zitolo** (*michael.zitolo@gmail.com*), School of the Future, New York, N.Y.

Prisider: Scephali Thakkar (*thakkarS@lisd.net*), Lewisville (Tex.) ISD

Help students process and retain key content through routine science writing. Learn and adapt classroom tools, including notebook structures, reflective writing prompts, and metacognitive tasks.

### Space Station Explorers

(Grades 5–12)

511C, Convention Center

Science Focus: ESS

**Dan Barstow**, CASIS, Melbourne, Fla.

In affiliation with NASA, Space Station Explorers offers teachers and students pathways to the International Space Station. Amazing free resources for middle school and high school students.

### To Infinity and Beyond: Send Students' Experiments to Space

(Grades 6–College)

514, Convention Center

Science Focus: GEN, INF, SEP

**Bill Harris** (@wharris), Beaumont (Calif.) Unified School District

Launch your students' imaginations with High Altitude Ballooning projects combined with open-source electronics that can take student-created experiments to the edge of space and beyond.



### Early Elementary STEM Curriculum

(Grades K–2) 515B, Convention Center

Science Focus: GEN, NGSS

**Christelle Harding** ([charding@dps61.org](mailto:charding@dps61.org)), Decatur (Ill.) Public Schools

**Mary Purdy** ([mpurdy@dps61.org](mailto:mpurdy@dps61.org)) and **Katherine Dilbeck** ([kdilbeck@dps61.org](mailto:kdilbeck@dps61.org)), French Academy, Decatur, Ill.

We will address how instructional design, Problem-Based Learning, essential questions, and coding/technology, engineering, and core subjects weave together to form a solid STEM curriculum.

### Stories to STEM: Connecting Picture Books to Real-Life STEM Projects

(Grades 3–6) Kentia Hall B, Convention Center

Science Focus: GEN, SEP

**Melissa Thomas** ([tshrself17@aol.com](mailto:tshrself17@aol.com)), Newark Charter Primary/Intermediate School, Newark, Del.

Hear about ways to incorporate picture books and innovative STEM projects into the middle grades. Real-life connection is key!

### “Cutting the Carbon” Environmental Engineering

(Grades K–5) Kentia Hall F, Convention Center

Science Focus: ESS3, ETS1, SEP

**Karen Mayotte** ([kmayotte@nrsl.net](mailto:kmayotte@nrsl.net)), The Center School, Stow, Mass.

Elementary learners will embark on the engineering design process to combat the rise in atmospheric carbon levels through a variety of environmental engineering learning experiences.

## 11:00 AM–12 Noon Hands-On Workshops

### Building, Evaluating, and Using Systems Models

(Grades 10–College) 301 AB, Convention Center

Science Focus: ESS2.A, ESS2.C, ESS3.C, ESS3.D, ETS2, LS2.A, LS2.B, LS2.C, INF, CCC, SEP

**Claudia Ludwig** (@SystemsEd; [cludwig@systemsbiology.org](mailto:cludwig@systemsbiology.org)), Institute for Systems Biology, Seattle, Wash.

Bring your computer and walk through curriculum that teaches students how systems models are developed, evaluated, and applied to understand cancer and the environment.

### Patterns and Trends: Web-Based Exploration of Bird Populations from Local to Global

(Grades 7–College) 304 AB, Convention Center

Science Focus: LS, CCC, SEP

**Nancy Trautmann** ([nancy.trautmann@cornell.edu](mailto:nancy.trautmann@cornell.edu)), The Cornell Lab of Ornithology, Ithaca, N.Y.

**Michelle Watkins** ([michellewatkins@frontiernet.net](mailto:michellewatkins@frontiernet.net)), Beaver River Central School, Beaver Falls, N.Y.

**James MaKinster**, Hobart and William Smith College, Geneva, N.Y.

Using eBird data and visualization tools, we will map and graph patterns over space and time to learn about habitats, adaptations, migration, and life cycles.

### A Three-Dimensional Look at Your Oldies but Goodies

(Grades 6–College) 306 AB, Convention Center

Science Focus: GEN, NGSS

**James Clark**, San Lorenzo (Calif.) Unified School District  
**Samantha Johnson** (@SciInnovations; [smjohnson@slzsd.org](mailto:smjohnson@slzsd.org)), Arroyo High School, San Lorenzo, Calif.

Don't throw the baby out with the bathwater! Take your tried-and-true labs and activities and shift them to the three-dimensional learning the NGSS requires.

### Science for All Ages: Use Cloud Observation to Immerse Your Students in the Real Process of Science

(Grades K–12) 308 AB, Convention Center

Science Focus: ESS, CCC1, CCC3, CCC5, SEP1, SEP3, SEP4, SEP5

**Sarah McCrea**, SSAI/NASA Langley Research Center, Hampton, Va.

President: Preston Lewis, NASA Langley Research Center, Hampton, Va.

Become one of the first users of the new NASA GLOBE cloud protocol. Free for everyone and easy to access—start observing clouds today!

### Guess the Chemical Compound!

(Grades 9–College) 404 AB, Convention Center

Science Focus: LS1, PS, CCC1, CCC6, SEP1, SEP8

**Lucia Chacon Diaz** (*lbchacon@nmsu.edu*) and **Cecilia Hernandez** (*@DrCeci2011; cecimh@nmsu.edu*), New Mexico State University, Las Cruces

Encourage students to interact in pairs and learn about the different chemical and physical properties of chemical compounds with the aid of technology.

### Just Add Markers: Using Whiteboards to Evaluate Student Thinking

(Grades 5–12) 406 AB, Convention Center

Science Focus: GEN, NGSS

**Karen Newman** (*kari.newman@da.org*) and **Megan Harms** (*meg.mcnall@da.org*), Durham Academy Upper School, Durham, N.C.

Do you want to change the dynamic in your classroom? Do you want to hear more from your students about how they think? Come experience whiteboarding!

### Art and the Cosmic Connection: STEAM in Action

(Grades 5–10) 409 AB, Convention Center

Science Focus: ESS2, CCC1, SEP4

**Whitney Cobb** (*@STEM\_McREL; @cosmoquestX; wcobb@mcrel.org*), McREL International, Denver, Colo.

Pluto! Ceres! Mars! Stunning images arrive from NASA missions to planets, asteroids, moons. The elements of art help you hone observation skills, inspire questions.

### Carbon and Climate: E-Unit for Grades 6–8

(Grades 6–8) 503, Convention Center

Science Focus: ESS2.A, ESS2.D, ESS3.D, CCC1, CCC4, CCC7, SEP2, SEP3, SEP4, SEP6, SEP7

**Sandra Derby** (*stderby@ucanr.edu*), California Project Learning Tree, Davis

Join us to explore an innovative carbon-and-climate-centric e-Unit for middle schoolers, organized around science education's 5E (Engage, Explore, Explain, Elaborate, and Evaluate) instructional model and tied to current standards, especially NGSS!

### Wading into Ecology: Using Aquatic Invertebrates to Explore Stream Ecosystems

(Grades 6–8) 511 AB, Convention Center

Science Focus: LS2.A, LS2.B, LS2.C, CCC4, CCC5, SEP2, SEP3, SEP4, SEP5, SEP7, SEP8

**Keith Piccard** (*@KeithPiccard; piccarke@gvsu.edu*) and **Peter Riemersma** (*riemersp@gvsu.edu*), Grand Valley State University, Allendale, Mich.

With our NGSS-ready, 5E learning cycle approach, participants will classify living aquatic macroinvertebrates to show how these invertebrates interact within a stream habitat.

### Applying Three-Dimensional Learning to Everyday Phenomena

(Grades K–8) Kentia Hall G, Convention Center

Science Focus: GEN, NGSS

**Carolyn Mohr** (*carolynmohr@sbcglobal.net*), University Center of Lake County, Grayslake, Ill.

**Susanne Hokkanen** (*susanne.hokkanen@gmail.com*), Heritage Middle School, Summit Argo, Ill.

NGSS's three-dimensional learning is modeled as attendees participate in 5E (Engage, Explore, Explain, Elaborate, and Evaluate) inquiry lesson plans while observing and investigating discrepant events and evaluating everyday scientific phenomena.

### Know Nuclear!

(Grades 9–12) Kentia Hall H, Convention Center

Science Focus: PS1

**Kathleen Dwyer** (*kathleen.dwyer@mrhschools.net*), MRH High School, Maplewood, 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.

### Revising Explanatory Models through Peer Feedback

(Grades 1–8) Kentia Hall J, Convention Center

Science Focus: GEN, SEP

**Monika Patel** (*mpatel0056@gmail.com*), KIPP Create College Prep, Chicago, Ill.

**Robin Thompson**, Tarkington School of Excellence, Chicago, Ill.

Presider: Alissa Berg (*alissaberg@gmail.com*), Academy for Urban School Leadership (AUSL), Chicago, Ill.

Explore ways to support students to construct kind, specific, and helpful feedback on their peers' scientific models. Analyze student work samples and walk away with tools improve the quality of peer revision.

**Dixie® Cup Physics**

(Grades 9–12) *Kentia Hall L, Convention Center*

Science Focus: PS, SEP

**Chelsea Foo**, Santa Fe High School, Edmond, Okla.

The students are given a task to let a ball bearing down a collision ramp and set the Dixie cup where it can catch it. They collect data and calculate the distance. When they can give a feasible answer they run the experiment.

**Gaining Perspective: Using Video to Reflect on Teaching Practice Around Integrating CCSS ELA Strategies into Science Instruction**

(Grades 5–9) *Kentia Hall M, Convention Center*

Science Focus: GEN, SEP

**Tom Jenkins** (@tomjenkinsstem; *tjenkins@greenonschools.org*), Teaching Channel, Springfield, OH

**Gina Tesoriero** (*ginatesoriero@gmail.com*), M.S. 319 Maria Teresa Mirabal School, New York, N.Y.

We will identify a “problem of practice” that participants want to explore through videotaping their teaching.

**Middle School STEM: Adventures in Neuroscience, Bioengineering, and Biotechnology Through an Innovative Curriculum**

(Grades 6–8) *Kentia Hall N, Convention Center*

Science Focus: ETS1, LS, PS1

**Beatriz Perez-Sweeney** (*perezswe@bcm.edu*), **Nancy Moreno** (*nmoreno@bcm.edu*), and **Christopher Burnett** (@tophb; *caburnet@bcm.edu*), Baylor College of Medicine, Houston, Tex.

**Tesha Williams** (*twilli71@houstonisd.org*) and **Misty Kirkland**, Baylor College of Medicine Academy at Ryan, Houston, Tex.

Explore a unique strand of the signature courses—Neuroscience, Scientific Decision Making, and Fundamentals in Biotechnology and Bioengineering—taught in a Title 1 public middle school.

**11:30 AM–12 Noon Presentations**

**Teaching with Screen-Capture Podcasts**

(Grades 3–12) *501 AB, Convention Center*

Science Focus: GEN, NGSS

**Wendy E. Van Norden** (*wvannorden@hw.com*), Harvard-Westlake Upper School, Studio City, Calif.

Learn how to turn science lessons into short screen capture podcasts that your students can watch and take notes at their own pace.



**Science Notebooks Reloaded**

(Grades K–5) *502A, Convention Center*

Science Focus: GEN, NGSS

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

We will examine ways in which science notebooks serve as an authentic means to develop elementary students’ scientific ideas as well as language and literacy.

**You Do Have Time! Infuse Literacy, Digital Citizenship, and Research into Your Science Lessons Without Breaking a Sweat!**

(Grades 3–6) *Kentia Hall C, Convention Center*

Science Focus: GEN, CCC

**Sara Torpey**, Encyclopædia Britannica, Inc., Chicago, Ill.

Discussion centers on ways to build literacy, digital citizenship, and research skills with the simple addition of informational text and media resources!

**SAVE**

**THE**

**DATES**

**2017**

**NSTA**

**AREA CONFERENCES ON  
SCIENCE EDUCATION**

**BALTIMORE**

MARYLAND

10/5-10/7

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**MAKING SCIENCE  
ACCESSIBLE: FULL  
SPEED AHEAD**

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**MILWAUKEE**

WISCONSIN

11/9-11/11

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**MAKING WAVES: MOVING  
SCIENCE FORWARD!**

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**NEW ORLEANS**

LOUISIANA

11/30-12/2

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**CELEBRATE SCIENCE:  
INSPIRE, INTEGRATE,  
INNOVATE**

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**PROFESSIONAL DEVELOPMENT STRANDS**

**ANCHORING OUR NATURAL  
TREASURES THROUGH  
ENVIRONMENTAL LITERACY**

**CHARTING THE COURSE  
FOR INNOVATION**

**TYING THE KNOT: COHERENCE  
IN 3D SCIENCE LEARNING**

**PREPARING ALL STUDENTS  
FOR THE VOYAGE**

**NAVIGATING STEM  
THROUGH THE NGSS**

**BUOYING UP LITERACY  
WITH SCIENCE**

**INSPIRE OUR  
YOUNG LEARNERS**

**INTEGRATE SCIENCE  
EDUCATION FOR ALL**

**INNOVATE SCIENCE  
EDUCATION FOR TOMORROW**

FOR MORE INFORMATION AND UPDATES,  
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**#NSTA17**

**NSTA** National  
Science  
Teachers  
Association

### Saturday, April 1

APAST Breakfast/Business Meeting

By Invitation Only

Diamond Blrm. Salon 1, JW Marriott ..... 7:00–9:00 AM

NSTA Past Presidents' Breakfast

By Invitation Only

Gold Blrm. Salon 4, JW Marriott ..... 7:30–8:15 AM

Teaming Up for STEM: Team Discussion and Planning Meeting

By Invitation Only

Diamond Blrm. Salon 4, JW Marriott ..... 8:00–10:00 AM

Past Presidents Advisory Board Meeting

Gold Blrm. Salon 4, JW Marriott ..... 8:15–9:15 AM

Shell Panel Meeting

By Invitation Only

Georgia 1, JW Marriott ..... 8:30–10:30 AM

Elementary Science Teaching Methods Meeting—ASTE

For details, visit [farwestaste.wordpress.com](http://farwestaste.wordpress.com).

Olympic 2, JW Marriott ..... 9:00–10:00 AM

NSTA International Lounge

Atrium 1, JW Marriott ..... 9:00 AM–5:00 PM

NSTA Standing Committee, Advisory Board and Panel Chairs Meeting

By Invitation Only

Olympic 2, JW Marriott ..... 1:00–2:00 PM

NSTA Council Roundtable

By Invitation Only

Atrium 2, JW Marriott ..... 2:00–4:00 PM

### Sunday, April 2

Life Members' Morning Social

By Invitation Only

Olympic 1, JW Marriott ..... 7:30–8:30 AM

## Index of Exhibitor Workshops

### Bio-Rad Laboratories, Inc. (Booth #1540)

Saturday, Apr 1	8:00–9:30 AM	404 AB, Conv. Center	Contagion! Track the Spread of Dangerous Disease (p. 24)
Saturday, Apr 1	10:00–11:30 AM	404 AB, Conv. Center	Investigate Photosynthesis and Cellular Respiration with Algae Beads (p. 39)

### BIOZONE International, Ltd. (Booth #1239)

Saturday, Apr 1	10:00–11:30 AM	503, Conv. Center	BIOZONE's NGSS Series for High School (p. 40)
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### Celestron (Booth #1950)

Saturday, Apr 1	8:00–9:30 AM	410, Conv. Center	BUGDORK! Using Insects to Engage Students and Inspire Learning (p. 24)
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### Educational Innovations, Inc. (Booth #1118)

Saturday, Apr 1	10:00–11:30 AM	408A, Conv. Center	3-2-1 Blast Off! (p. 39)
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### Flinn Scientific, Inc. (Booth #1825)

Saturday, Apr 1	10:00–11:30 AM	403A, Conv. Center	Flinn Scientific's STEM <i>Design Challenge</i> ™ Activities (p. 38)
Saturday, Apr 1	12 Noon–1:30 PM	403A, Conv. Center	Hands-On Integrated Science Activities for Middle School from Flinn Scientific (p. 52)

### Houghton Mifflin Harcourt (Booth #2124)

Saturday, Apr 1	8:00–9:30 AM	408B, Conv. Center	Engineering for the NGSS Upper Elementary Science Classroom (p. 24)
Saturday, Apr 1	10:00–11:30 AM	408B, Conv. Center	Modeling Structure and Function with Help from Our Feathered Friends (p. 39)
Saturday, Apr 1	12 Noon–1:30 PM	408B, Conv. Center	Awesome Activities for an NGSS Classroom (Bio and Earth Space) (p. 52)

### Kids2Glow (Booth #2315)

Saturday, Apr 1	10:00–11:30 AM	512, Conv. Center	Teach STEM and Make Extra Cash with RoboRobo Robotics for K–12 Grades (p. 40)
Saturday, Apr 1	12 Noon–1:30 PM	512, Conv. Center	Add STEM to ANY Classroom Curriculum with RoboRobo Robotics for Grades K–8 (p. 52)

### Lab-Aids, Inc. (Booth #1126)

Saturday, Apr 1	10:00–11:30 AM	518, Conv. Center	Modeling the Introduction of a New Species: NGSS Ecology (p. 40)
Saturday, Apr 1	12 Noon–1:30 PM	518, Conv. Center	Convection Currents and Continental Drift (p. 52)
Saturday, Apr 1	2:00–3:30 PM	518, Conv. Center	Make a Wet Cell Battery (p. 68)

### Learning Bits (Booth #1059)

Saturday, Apr 1	8:00–9:30 AM	403B, Conv. Center	Science Bits: The 17-Time Digital Curriculum Award-Winner That Enhances Learning with Understanding (p. 24)
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### LEGO® Education (Booth #1836)

Saturday, Apr 1	8:00–9:30 AM	304C, Conv. Center	Bring Robotics to your Science Classroom with LEGO® MINDSTORMS® Education EV3 (p. 23)
Saturday, Apr 1	10:00–11:30 AM	304C, Conv. Center	Make Science Come to Life Through Modeling with LEGO Education (p. 38)
Saturday, Apr 1	12 Noon–1:30 PM	304C, Conv. Center	Learn to Code with LEGO® MINDSTORMS® Education EV3 (p. 51)
Saturday, Apr 1	2:00–3:30 PM	304C, Conv. Center	Tackle Renewable Energy with LEGO Education (p. 68)



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### McGraw-Hill Education (Booth #2343)

Saturday, Apr 1	10:00–11:30 AM	406 AB, Conv. Center	Three Steps to AP Exam Success (p. 39)
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### Measured Progress (Booth #1338)

Saturday, Apr 1	10:00–11:30 AM	409 AB, Conv. Center	Assess the NGSS: Formative Assessment Strategies for Grades K–8 (p. 39)
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### MSOE Center for BioMolecular Modeling (Booth #1037)

Saturday, Apr 1	8:00–9:30 AM	153B, Conv. Center	Bird Flu, Swine Flu, Pandemic Flu—Oh My! (p. 23)
Saturday, Apr 1	10:00–11:30 AM	153B, Conv. Center	A Visual Journey through the Human Cell with Watercolor Landscapes (p. 37)
Saturday, Apr 1	12 Noon–1:30 PM	153B, Conv. Center	You’ve Got Some Nerve! Exploring Neuronal Communication (p. 51)

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### National Geographic (Booths #2040 and #2043)

Saturday, Apr 1	8:00–9:30 AM	409 AB, Conv. Center	Become a Nat Geo—Certified Educator (p. 24)
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### Pali Institute (Booth #1867)

Saturday, Apr 1	8:00–9:30 AM	301 AB, Conv. Center	Outdoor Education in Southern California (p. 23)
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### Perimeter Institute for Theoretical Physics (Booth #1254)

Saturday, Apr 1	10:00–11:30 AM	501 AB, Conv. Center	Let Them Question! An Alternative Way of Understanding the Universe (p. 40)
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### PlayMada Games (Booth #2117)

Saturday, Apr 1	10:00–11:30 AM	153C, Conv. Center	The Power of Game-Based Learning in the Science Classroom (p. 37)
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### Project Lead The Way, Inc. (Booth #2328)

Saturday, Apr 1	10:00–11:30 AM	305, Conv. Center	Engaging Your Students in 3D Problem-Based Learning: Making It Happen (p. 38)
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### Publisher Spotlight (Booth #1134)

Saturday, Apr 1	10:00–11:30 AM	301 AB, Conv. Center	Oh, Ick! Science Experiments Guaranteed to Gross You Out (p. 38)
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### Simulation Curriculum Corp. (Booth #728)

Saturday, Apr 1	10:00–11:30 AM	511 AB, Conv. Center	Amazing Astronomical Phenomena (p. 40)
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### Society for Neuroscience (Booth #825)

Saturday, Apr 1	10:00–11:30 AM	403B, Conv. Center	How the Teen Brain Learns (p. 39)
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### South Dakota State University Dept. of Chemistry (Booth #1250)

Saturday, Apr 1	8:00–9:30 AM	406 AB, Conv. Center	Using the Classic Demonstration to Engage Students in Science Talk (p. 24)
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### Springbay Studio, Ltd. (Booth #636)

Saturday, Apr 1	8:00–9:30 AM	503, Conv. Center	Teach Biodiversity By Building Interactive Virtual Bio Domes! (p. 25)
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## Index of Exhibitor Workshops

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### TCI (Booth #942)

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Saturday, Apr 1	8:00–9:30 AM	153A, Conv. Center	Engineering Design in the NGSS (p. 23)
Saturday, Apr 1	10:00–11:30 AM	153A, Conv. Center	Performance Assessments—Engaging and Fun! (p. 37)
Saturday, Apr 1	12 Noon–1:30 PM	153A, Conv. Center	Phenomena-Driven Lessons for the Middle School Classroom (p. 51)

### Texas Instruments (Booth #1633)

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Saturday, Apr 1	8:00–9:30 AM	511 AB, Conv. Center	Zombie Apocalypse! (p. 25)
Saturday, Apr 1	12 Noon–1:30 PM	511 AB, Conv. Center	Using Maggots, Flies, and Flesh to Solve a Mystery! (p. 52)
Saturday, Apr 1	2:00–3:30 PM	511 AB, Conv. Center	Smart Management of Water Resources Using TI Graphing Calculators and the TI-Innovator Hub (p. 68)

### U.S. Fish and Wildlife Service (Booth #2060)

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Saturday, Apr 1	8:00–9:30 AM	303 AB, Conv. Center	The Secret Lives of Fish: Migration, Movement, and More (p. 23)
Saturday, Apr 1	10:00–11:30 AM	303 AB, Conv. Center	The Junior Duck Stamp Program: Integrating Science with Art (p. 38)
Saturday, Apr 1	12 Noon–1:30 PM	303 AB, Conv. Center	Educating on the Wild Side with the U.S. Fish and Wildlife Service (p. 51)

### Vaccine Education Center (Booth #524)

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Saturday, Apr 1	8:00–9:30 AM	408A, Conv. Center	How Do Diseases Circumvent the Immune System? Engaging HS Students (p. 24)
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### Vernier Software & Technology (Booth #1625)

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Saturday, Apr 1	8:00–9:30 AM	402B, Conv. Center	Wind and Solar Energy Basics with Vernier (p. 23)
Saturday, Apr 1	8:00–9:30 AM	402A, Conv. Center	Biology with Vernier (p. 23)
Saturday, Apr 1	10:00–11:30 AM	402A, Conv. Center	Integrating Chromebook with Vernier Technology (p. 38)
Saturday, Apr 1	10:00–11:30 AM	402B, Conv. Center	Elementary Science with Vernier (p. 38)
Saturday, Apr 1	12 Noon–1:30 PM	402B, Conv. Center	Physics with Vernier (p. 52)
Saturday, Apr 1	12 Noon–1:30 PM	402A, Conv. Center	Chemistry with Vernier (p. 51)
Saturday, Apr 1	2:00–3:30 PM	402A, Conv. Center	Human Physiology with Vernier (p. 68)
Saturday, Apr 1	2:00–3:30 PM	402B, Conv. Center	Introductory Engineering Design Projects with Vernier (p. 68)

### WhiteBox Learning (Booth #1048)

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Saturday, Apr 1	10:00–11:30 AM	410, Conv. Center	Turn-Key STEM/Engineering Program by WhiteBox Learning (p. 40)
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**Earth and Space Science: Saturday**

8:00–8:30 AM	K–8	505, Conv. Center	STEM with Sharks: Leveraging the Ocean to Teach <i>Next Generation Science Standards</i> (p. 15)
8:00–9:00 AM	9–12	West Hall B-5, Conv. Center	Making Sense of the Sun (p. 22)
8:00–9:00 AM	6–8	West Hall B-3, Conv. Center	The Role of Students’ Gestures in Constructing Explanations (p. 22)
8:00–9:00 AM	7–C	Platinum Blrm. Salon B, JW Marriott	Building STEM through Exploring Our Climate System (p. 19)
8:00–9:00 AM	6–12	Kentia Hall P, Conv. Center	Studying Earth’s Climate from Above (p. 22)
8:00–9:00 AM	K–12	Petree Hall D, Conv. Center	NESTA and NSTA Aerospace Education Advisory Board Space Science Share-a-Thon (p. 22)
8:00–9:30 AM	3–5	408B, Conv. Center	Engineering for the NGSS Upper Elementary Science Classroom (p. 24)
8:00–9:30 AM	3–8	402B, Conv. Center	Wind and Solar Energy Basics with Vernier (p. 23)
8:30–9:00 AM	K–6	Kentia Hall G, Conv. Center	Shifting Practice in a Title I Urban Elementary to Empower Teachers to Increase Science Learning Opportunities (p. 26)
9:30–10:30 AM	2–12	Plaza 3, JW Marriott	Wonderful Watersheds! (p. 30)
9:30–10:30 AM	10–C	West Hall B-5, Conv. Center	Real-World Three-Dimensional Environmental Science (p. 31)
9:30–10:30 AM	K–12	Theatre (411), Conv. Center	Climate Change: Why K–12 Education Is a Seminal Part of the Solution (p. 28)
9:30–10:30 AM	6–12	Kentia Hall P, Conv. Center	Science from the Ends of Earth: Nat Geo Fellows Bring Field Experiences into the Classroom (p. 31)
9:30–10:30 AM	K–5	Kentia Hall G, Conv. Center	Destination: NASA...1st-Century Skills and STEAM (p. 34)
9:30–10:30 AM	5–C	Kentia Hall K, Conv. Center	Your Ecological Footprint in a 3D NGSS Classroom (p. 34)
9:30–10:30 AM	4–7	505, Conv. Center	Story and Poetry of Science (p. 30)
9:30–10:30 AM	5–8	Petree Hall D, Conv. Center	The Augmented Reality Sandbox: Experiences of Use in the Classroom (p. 35)
9:30–10:30 AM	7–C	515A, Conv. Center	Yes, Humans Really Do Cause Earthquakes: Hydraulic Fracturing, Wastewater Injection, and Earthquakes (p. 34)
9:30–10:30 AM	5–9	Diamond Blrm. Salon 3, JW Marriott	NSTA Press® Session: Solar Science = NGSS-Focused Solar Astronomy Experiences + Preparation for the All American Total Solar Eclipse (p. 32)
10:00–11:30 AM	8–12	501 AB, Conv. Center	Let Them Question! An Alternative Way of Understanding the Universe (p. 40)
10:00–11:30 AM	6–12	511 AB, Conv. Center	Amazing Astronomical Phenomena (p. 40)
10:00–11:30 AM	9–12	503, Conv. Center	BIOZONE’s NGSS Series for High School (p. 40)
11:00 AM–12 Noon	6–C	Platinum Blrm. Salon J, JW Marriott	The Helping Trio: Where Students Help Students Through Reading, Writing, Discussion, and Real-World Application (p. 43)
11:00 AM–12 Noon	5–8	514, Conv. Center	The House Project: A Science-Math Collaborative, Cross-Curricular Design Project (p. 44)
11:00 AM–12 Noon	9–12	Platinum Blrm. Salon B, JW Marriott	Aquaponics in the Classroom: Preparation for the Multidisciplinary STEM Workforce! (p. 47)
11:00 AM–12 Noon	4–6	Kentia Hall B, Conv. Center	Scientific Discoveries Shed Light on Karana’s World—Integrating Science and Language Arts in <i>Island of the Blue Dolphins</i> (p. 44)
11:00 AM–12 Noon	6–9	West Hall B-4, Conv. Center	Tools for Scaffolding Argumentation to Engage Students and Build Understanding (p. 49)
11:00 AM–12 Noon	K–6	Petree Hall D, Conv. Center	Promoting Elementary Science Literacy in Three Dimensions with the 2017 U.S. Total Solar Eclipse (p. 44)
11:00 AM–12 Noon	7–11	Kentia Hall P, Conv. Center	Inquiry Beyond Four Walls: Earth Science Outdoor Learning (p. 48)
11:00 AM–12 Noon	5–9	Kentia Hall Q, Conv. Center	Engaging Middle School Girls from Underrepresented Groups in Astronomy and Astrobiology Learning Using the Creative Arts (p. 44)
11:00 AM–12 Noon	K–2	Kentia Hall E, Conv. Center	Making Sense of the Sky: First Graders Construct Explanations and Communicate Their Findings through Digital Stories (p. 47)
12 Noon–1:30 PM	6–8	518, Conv. Center	Convection Currents and Continental Drift (p. 52)
12 Noon–1:30 PM	9–12	408B, Conv. Center	Awesome Activities for an NGSS Classroom (Bio and Earth/Space) (p. 52)
12 Noon–1:30 PM	5–8	403A, Conv. Center	Hands-On Integrated Science Activities for Middle School from Flinn Scientific (p. 52)
12:30–1:00 PM	5–9	506, Conv. Center	Turning Classroom Scientists into Citizen Scientists: Connecting Citizen Science and Secondary Research with FrogWatch USA (p. 53)

## Schedule at a Glance Earth and Space Science

12:30–1:30 PM	6–12	Kentia Hall P, Conv. Center	AREN: Doing Team-Based Field Investigations with a GLOBE Earth Science Partner (p. 56)
12:30–1:30 PM	9–12	West Hall B-5, Conv. Center	Earthquakes—From Paper to ArcGIS (p. 56)
12:30–1:30 PM	6–C	Petree Hall D, Conv. Center	NESTA Geology Share-a-Thon (p. 59)
12:30–1:30 PM	5–12	Platinum Blrm. Salon J, JW Marriott	The Big Bang in the Classroom: An NGSS Story Line and Evidence-Based Reasoning (p. 55)
12:30–2:30 PM	G	151, Conv. Center	Science in the Community Session: Using Informal Science Experiences to Explore Environmental Issues (p. 60)
1:00–1:30 PM	4–8	506, Conv. Center	Plant Invaders! An Interactive Game Exploring Invasive and Native Plants of California (p. 61)
2:00–3:00 PM	K–4	Petree Hall D, Conv. Center	NESTA, UCAR, and NASA Share: Bringing the Science of Climate Change to Young Learners with Elementary GLOBE (p. 67)
2:00–3:00 PM	6–8	504, Conv. Center	STEM Road Map, 6–8: Integrated STEM Teaching in Middle School (p. 64)
2:00–3:00 PM	7–12	Kentia Hall P, Conv. Center	Stellar Evolution—From Star Formation to Catastrophic Destruction (p. 67)
2:00–3:00 PM	K–12	Platinum Blrm. Salon D, JW Marriott	Using Climate Science and Mathematics to Engage All Learners (p. 63)
2:00–3:00 PM	3–8	Kentia Hall H, Conv. Center	Exploring Unknown Worlds Through Models, Images, and Data Analysis (p. 66)
2:00–3:00 PM	6–8	Kentia Hall Q, Conv. Center	Is It Hot in Here? Climate Change Lessons for Intermediate Students (p. 67)
3:30–4:30 PM	K–12	Plaza 3, JW Marriott	NSELA-Sponsored Session: Uncovering Teacher Misconceptions Through the Use of Formative Assessment Strategies (p. 71)
3:30–4:30 PM	5–9	Kentia Hall Q, Conv. Center	From the Merman to the Weatherman: The Evolution of Weather Prediction (p. 73)
3:30–4:30 PM	4–10	Diamond Blrm. Salon 10, JW Marriott	A New Tool for Using Smithsonian Resources to Support Science in the Classroom (p. 74)
3:30–4:30 PM	K–2	Kentia Hall E, Conv. Center	Made for the Shade: A SUN-sational Engineering Design Unit (p. 75)
3:30–4:30 PM	4–C	Petree Hall D, Conv. Center	NESTA and PRI Share: <i>Teacher-Friendly Guides</i> ™ to the Earth Science of the United States: Regional Content Guides for Place-Based Approaches to Earth System Science Education (p. 73)
5:00–5:30 PM	P–3	502A, Conv. Center	Poetry for Young Investigators (p. 77)
5:00–6:00 PM	8–12	Diamond Blrm. Salon 7, JW Marriott	Hands-On STEM Curriculum as a Way to Support Three-Dimensional Learning (p. 79)
5:00–6:00 PM	G	Platinum Blrm. Salon J, JW Marriott	Space Exploration's Future and NGSS Engineering Practices Converge (p. 78)
5:00–6:00 PM	G	Petree Hall D, Conv. Center	National Earth Science Teachers Association (NESTA) Shares: Rock, Mineral, and Fossil Raffle (p. 80)

### Earth and Space Science: Sunday

8:00–9:00 AM	K–12	511 AB, Conv. Center	NESTA and HHMI Share: Welcome to the Anthropocene: Teaching Resources for a New Epoch (p. 86)
8:00–9:00 AM	P–2	Kentia Hall C, Conv. Center	Get Caught Up in Our Science Web! (p. 86)
8:00–9:00 AM	6–8	503, Conv. Center	Weather Watchers Using Models, Maps, and Data (p. 86)
8:00–9:00 AM	6–12	510, Conv. Center	To Build or Not to Build: Using Engineering, GIS, Exploration, and News Articles to Answer the Question (p. 84)
8:00–9:00 AM	9–C	409 AB, Conv. Center	An Authentic Research Experience for Teachers: The NASA/IPAC Teacher Research Program (NITARP) (p. 84)
8:00–9:00 AM	4–12	511C, Conv. Center	Radio Astronomy in Your Classroom with NASA's GAVRT Project (p. 84)
8:00–9:00 AM	5–8	Kentia Hall N, Conv. Center	Integrating Literacy and Technology into a Geology Unit Using a Conceptual Story Line (p. 87)
8:00–9:00 AM	7–C	306 AB, Conv. Center	Discovering and Measuring Earth's Layered Interior: A Three-Dimensional Learning Activity from IRIS (p. 85)
8:00–9:00 AM	6–12	408B, Conv. Center	Environmental Science and GIS Geoinquiries (p. 83)

9:30–10:30 AM	K–12	308 AB, Conv. Center	NASA Data for One, NASA Data for All! Use MY NASA DATA in Your Classroom from K–12 for All Your Earth Science Data Needs (p. 90)
9:30–10:30 AM	4–C	309, Conv. Center	NESTA and CZO Share: The Critical Zone (CZ): Where Rock Meets Life and the NGSS Meets Your Class! (p. 88)
9:30–10:30 AM	K–12	510, Conv. Center	NGSS Meets NASA: Fearless Engineering for All Students (p. 89)
9:30–10:30 AM	5–12	405, Conv. Center	Team Science: Biodiversity, Population Genetics, and Interdependence in the 21st-Century Classroom (p. 91)
9:30–10:30 AM	4–10	513, Conv. Center	SOFIA Airborne Astronomy (p. 89)
9:30–10:30 AM	5–8	511 AB, Conv. Center	Tides Around the World (p. 91)
11:00–11:30 AM	3–12	501 AB, Conv. Center	Using Google Earth to Teach Earth Science (p. 93)
11:00 AM–12 Noon	K–12	308 AB, Conv. Center	Science for All Ages: Use Cloud Observation to Immerse Your Students in the Real Process of Science (p. 95)
11:00 AM–12 Noon	5–12	511C, Conv. Center	Space Station Explorers (p. 94)
11:00 AM–12 Noon	10–C	301 AB, Conv. Center	Building, Evaluating, and Using Systems Models (p. 95)
11:00 AM–12 Noon	6–8	503, Conv. Center	Carbon and Climate: E-Unit for Grades 6–8 (p. 96)
11:00 AM–12 Noon	5–10	409 AB, Conv. Center	Art and the Cosmic Connection: STEAM in Action (p. 96)
11:00 AM–12 Noon	K–5	Kentia Hall F, Conv. Center	“Cutting the Carbon” Environmental Engineering (p. 95)

### Engineering, Technology, and the Application of Science: Saturday

8:00–8:30 AM	6–12	Kentia Hall N, Conv. Center	High-Altitude Ballooning for Middle School and High School Students (p. 16)
8:00–8:30 AM	K–8	505, Conv. Center	STEM with Sharks: Leveraging the Ocean to Teach <i>Next Generation Science Standards</i> (p. 15)
8:00–8:30 AM	3–6	506, Conv. Center	STEM in a Blender (p. 15)
8:00–9:00 AM	K–8	Kentia Hall J, Conv. Center	Developing Innovators and Entrepreneurs Through STEM-Focused Reading! (p. 21)
8:00–9:00 AM	G	Platinum Blrm. Salon C, JW Marriott	Leveraging Digital Design and Fabrication Tools in Your Classroom (p. 19)
8:00–9:00 AM	6–12	Diamond Blrm. Salon 9, JW Marriott	Expanding Our Capacity for Observation: Prototyping Tools for Scientific Investigation with Arduino Electronics Boards (p. 19)
8:00–9:00 AM	1–12	Platinum Blrm. Salon D, JW Marriott	STEER: STEM Training for Engineering Educators Using Robotics (p. 19)
8:00–9:00 AM	6–8	Kentia Hall R, Conv. Center	Learning About Ecosystem Management Through NGSS: Developing Solutions to Invasive Species Using Science and Engineering Practices (p. 22)
8:00–9:00 AM	P–3	West Hall B-2, Conv. Center	Exploring STEM Across the Curriculum (p. 22)
8:00–9:00 AM	1–5	502B, Conv. Center	Support English Language Learners in STEM Education Through Engagement in Engineering Challenges (p. 20)
8:00–9:00 AM	K–5	Atrium 3, JW Marriott	NSELA-Sponsored Session: Engineering Cafe (p. 16)
8:00–9:00 AM	G	Platinum Blrm. Salon J, JW Marriott	Urban STEM-ification (p. 17)
8:00–9:00 AM	6–12	Diamond Blrm. Salon 6, JW Marriott	Cracking the Case: Integrating Biology and Engineering in Case Studies (p. 19)
8:00–9:30 AM	7–C	402A, Conv. Center	Biology with Vernier (p. 23)
8:00–9:30 AM	3–5	408B, Conv. Center	Engineering for the NGSS Upper Elementary Science Classroom (p. 24)
8:00–9:30 AM	5–8	153A, Conv. Center	Engineering Design in the NGSS (p. 23)
8:00–9:30 AM	3–8	402B, Conv. Center	Wind and Solar Energy Basics with Vernier (p. 23)
8:00–9:30 AM	5–12	304C, Conv. Center	Bring Robotics to your Science Classroom with LEGO® MINDSTORMS® Education EV3 (p. 23)
8:00–11:00 AM	P–8	Santa Anita A, Westin	Hands-On/Minds-On STEM: An Integrated Engineering Design Challenge (SC-12) (p. 25)
8:30–9:00 AM	6–12	Kentia Hall N, Conv. Center	Robotics: A Pathway to Get Ready for the Real World (p. 26)
9:30–10:00 AM	3–12	Platinum Blrm. Salon H, JW Marriott	A Crash Course in Crash Research: An Insider’s Look at the IIHS’s Vehicle Research Center (p. 27)
9:30–10:30 AM	G	Platinum Blrm. Salon A, JW Marriott	AMSE-Sponsored Session: George W. Carver Conversation Series on Diversity and Equity (p. 29)

## Schedule at a Glance Engineering, Technology, and the Application of Science

9:30–10:30 AM	5–8	Petree Hall D, Conv. Center	The Augmented Reality Sandbox: Experiences of Use in the Classroom (p. 35)
9:30–10:30 AM	4–6	Kentia Hall M, Conv. Center	Robotics and Physical Science (p. 31)
9:30–10:30 AM	4–C	Platinum Blrm. Salon B, JW Marriott	Electric Art (p. 32)
9:30–10:30 AM	7–12	Kentia Hall N, Conv. Center	Mixing Colored Lights and Pigments: RGB vs. CMYK—a STEAM Approach (p. 35)
9:30–10:30 AM	G	Diamond Blrm. Salon 6, JW Marriott	How Can a STEM Teacher Become a Relevant and Sought-After Voice in Policy? (p. 29)
9:30–10:30 AM	P–5	West Hall B-2, Conv. Center	Story Starts to STEM: Using Children’s Literature to Enhance Your STEM Curriculum (p. 35)
9:30–10:30 AM	7–C	Platinum Blrm. Salon J, JW Marriott	The Magic of Inquiry (p. 30)
9:30–10:30 AM	2–12	Plaza 3, JW Marriott	Wonderful Watersheds! (p. 30)
9:30–10:30 AM	3–8	Kentia Hall F, Conv. Center	Water Wheel Challenge: An Engineering Design Lesson for Grades 3–8 Students (p. 34)
9:30–10:30 AM	K–5	515B, Conv. Center	STEAMING Along with DaVinci: Integrating Science and Engineering with the Arts in an Elementary Classroom (p. 31)
9:30–10:30 AM	9–12	Olympic 3, JW Marriott	ASTC-Sponsored Session: Neuroscience and Society: Conversations Connecting Brain Development and Social Constructs (p. 32)
9:30–10:30 AM	3–5	502B, Conv. Center	Science Coding: Combining Science and Computational Thinking (p. 32)
9:30–10:30 AM	10–C	West Hall B-5, Conv. Center	Real-World Three-Dimensional Environmental Science (p. 31)
10:00–10:30 AM	4–12	Platinum Blrm. Salon H, JW Marriott	A Simple New Design for a Microgravity Drop Box for Classroom Use (p. 36)
10:00–10:30 AM	K–12	Platinum Blrm. Salon D, JW Marriott	Implementing 3D Printing Across the K–12 Curriculum (p. 36)
10:00–10:30 AM	K–5	Kentia Hall B, Conv. Center	Engineering with Ease! (p. 37)
10:00–11:30 AM	3–C	402A, Conv. Center	Integrating Chromebook with Vernier Technology (p. 38)
10:00–11:30 AM	1–4	304C, Conv. Center	Make Science Come to Life Through Modeling with LEGO® Education (p. 38)
10:00–11:30 AM	5–12	403A, Conv. Center	Flinn Scientific’s STEM <i>Design Challenge</i> ™ Activities (p. 38)
10:00–11:30 AM	3–6	402B, Conv. Center	Elementary Science with Vernier (p. 38)
10:00–11:30 AM	K–12	512, Conv. Center	Teach STEM and Make Extra Cash with RoboRobo Robotics for K–12 Grades (p. 40)
10:00–11:30 AM	5–C	410, Conv. Center	Turn-Key STEM/Engineering Program by WhiteBox Learning (p. 40)
11:00–11:30 AM	7–11	506, Conv. Center	Simple Machines Design Challenge for Middle School Science and Math Students (p. 41)
12 Noon–1:30 PM	9–C	402A, Conv. Center	Chemistry with Vernier (p. 51)
11:00 AM–12 Noon	6–12	Platinum Blrm. Salon F, JW Marriott	“Shake It Up”: A Lesson in NGSS Engineering Design (p. 47)
11:00 AM–12 Noon	6–9	West Hall B-4, Conv. Center	Tools for Scaffolding Argumentation to Engage Students and Build Understanding (p. 49)
11:00 AM–12 Noon	4–C	Platinum Blrm. Salon D, JW Marriott	Groovy Sounds: NGSS Investigations into Sound (p. 47)
11:00 AM–12 Noon	9–12	Platinum Blrm. Salon B, JW Marriott	Aquaponics in the Classroom: Preparation for the Multidisciplinary STEM Workforce! (p. 47)
11:00 AM–12 Noon	6–C	Diamond Blrm. Salon 1, JW Marriott	Explore Building Mousetrap Vehicles to Integrate Science, Technology, Engineering, and Mathematics (STEM) (p. 46)
11:00 AM–12 Noon	6–12	507, Conv. Center	Do You Need a New Science Lab? (p. 43)
11:00 AM–12 Noon	5–8	514, Conv. Center	The House Project: A Science-Math Collaborative, Cross-Curricular Design Project (p. 44)
11:00 AM–12 Noon	5–9	Kentia Hall Q, Conv. Center	Engaging Middle School Girls from Underrepresented Groups in Astronomy and Astrobiology Learning Using the Creative Arts (p. 44)
12 Noon–1:30 PM	5–8	153A, Conv. Center	Phenomena-Driven Lessons for the Middle School Classroom (p. 51)
12 Noon–1:30 PM	9–C	402B, Conv. Center	Physics with Vernier (p. 52)
12 Noon–1:30 PM	9–C	153B, Conv. Center	You’ve Got Some Nerve! Exploring Neuronal Communication (p. 51)
12 Noon–1:30 PM	5–12	304C, Conv. Center	Learn to Code with LEGO® MINDSTORMS® Education EV3 (p. 51)
12 Noon–1:30 PM	K–8	512, Conv. Center	Add STEM to ANY Classroom Curriculum with RoboRobo Robotics for Grades K–8 (p. 52)

## Schedule at a Glance Engineering, Technology, and the Application of Science

12:30–1:00 PM	P–8	Kentia Hall J, Conv. Center	Integrating Science and Engineering Using the 5E Instructional Model (p. 53)
12:30–1:30 PM	6–C	Petree Hall D, Conv. Center	NESTA Geology Share-a-Thon (p. 59)
12:30–1:30 PM	5–C	Diamond Blrm. Salon 2, JW Marriott	Mighty <i>Phragmites</i> : A Collaborative University/K–6 iSTEAM Ecosystem PBL Project (p. 56)
12:30–1:30 PM	5–8/C	Platinum Blrm. Salon G, JW Marriott	Putting the “T” in STEM: Integrating Computing into STEM Learning for Middle School Girls (p. 58)
12:30–1:30 PM	P–8	West Hall B-2, Conv. Center	CESI-Sponsored Session: Combining Science with Art to Understand How We See Color—Using Negative Art for a Positive Effect (p. 59)
12:30–1:30 PM	9–12	Olympic 3, JW Marriott	ASTC-Sponsored Session: Mobile MAIA Science Lab: Using Dinosaurs and Cattle to Engage in Science and Math Concepts (p. 58)
12:30–1:30 PM	6–12	Diamond Blrm. Salon 9, JW Marriott	Engineering Practices in the Life Sciences (p. 56)
1:00–1:30 PM	4–8	Kentia Hall J, Conv. Center	How to Implement Technology into Your Inquiry-Based Science Classroom (p. 61)
2:00–2:30 PM	4–8	Kentia Hall J, Conv. Center	Helping Girls See Themselves as Capable Engineers (p. 61)
2:00–3:00 PM	6–12	Kentia Hall M, Conv. Center	Electrifying Ideas for Teaching Energy (p. 66)
2:00–3:00 PM	1–8	505, Conv. Center	Starting a Makerspace? Best Practices, NGSS Integration, and Lessons \ Learned! (p. 64)
2:00–3:00 PM	K–12	Platinum Blrm. Salon D, JW Marriott	Using Climate Science and Mathematics to Engage All Learners (p. 63)
2:00–3:00 PM	1–5	Kentia Hall E, Conv. Center	Planting the Seeds of STEAM: Designing Plant Packages with the Consumer in Mind (p. 66)
2:00–3:00 PM	1–5	Kentia Hall C, Conv. Center	Cleaning Up the Connections Between Science and Literacy: Integrating ELA and Science Through Real-World Context (p. 66)
2:00–3:00 PM	P–12	Diamond Blrm. Salon 2, JW Marriott	STEM Learning Through Cantilever Span Design and Construction (p. 65)
2:00–3:00 PM	P–4	Kentia Hall F, Conv. Center	Toying with Integrative STEM (iSTEM) in Early Childhood Classrooms (p. 66)
2:00–3:30 PM	6–12	511 AB, Conv. Center	Smart Management of Water Resources Using TI Graphing Calculators and the TI-Innovator Hub (p. 68)
2:00–3:30 PM	9–C	402A, Conv. Center	Human Physiology with Vernier (p. 68)
2:00–3:30 PM	7–C	402B, Conv. Center	Introductory Engineering Design Projects with Vernier (p. 68)
2:30–3:00 PM	10–12	West Hall B-5, Conv. Center	Student Data Collection, Modeling, and Analysis of Nutrient Levels and Algae Growth in Lake Champlain Vermont (p. 69)
2:30–3:00 PM	4–9	Kentia Hall J, Conv. Center	Engaging Middle Years Girls in Math and Science Through Robotics Inquiry (p. 69)
3:00–6:00 PM	1–5	Santa Anita B, Westin	Hands-On Mathematics in Science Education (SC-16) (p. 69)
3:30–4:30 PM	7–9	505, Conv. Center	Middle School Science and Algebra I Collaboration: Ohm’s Law as a Mathematical Model (p. 72)
3:30–4:30 PM	4–10	Diamond Blrm. Salon 10, JW Marriott	A New Tool for Using Smithsonian Resources to Support Science in the Classroom (p. 74)
3:30–4:30 PM	6–8	513, Conv. Center	Matter Matters: A Three-Dimensional Middle School Unit (p. 72)
3:30–4:30 PM	K–5	Kentia Hall G, Conv. Center	Engineering in the Elementary Classroom (p. 75)
3:30–4:30 PM	3–6	Kentia Hall C, Conv. Center	ARMed (p. 74)
3:30–4:30 PM	K–2	Kentia Hall E, Conv. Center	Made for the Shade: A SUN-sational Engineering Design Unit (p. 75)
3:30–4:30 PM	6–C	Platinum Blrm. Salon G, JW Marriott	Inquiry-Based Activities for Middle School and High School Physics Classrooms (p. 74)
3:30–4:30 PM	2–5/C	502B, Conv. Center	Exploring Engineering Design with Elementary and Preservice Teams Through Distance Technology: Edible Lunar Vehicle (p. 71)
3:30–4:30 PM	3–8	Kentia Hall H, Conv. Center	Crosscutting NASA’s Journey to Mars with NGSS in Grades 3–8 (p. 75)
3:30–4:30 PM	5–9	Diamond Blrm. Salon 3, JW Marriott	NSTA Press® Session: Everyday Engineering (p. 73)
5:00–5:30 PM	5–8	Kentia Hall M, Conv. Center	Let’s Get Physical! Engineering Design Challenges for Middle School Physical Science (p. 77)
5:00–6:00 PM	K–6	West Hall B-4, Conv. Center	Rubric First: Engineers Start with Contracts Before Making Blueprints (p. 80)

## Schedule at a Glance Engineering, Technology, and the Application of Science

5:00–6:00 PM	8–12	Diamond Blrm. Salon 7, JW Marriott	Hands-On STEM Curriculum as a Way to Support Three-Dimensional Learning (p. 79)
5:00–6:00 PM	K–6	Kentia Hall C, Conv. Center	Robotics for the K–6 Classroom (p. 79)
5:00–6:00 PM	G	Platinum Blrm. Salon J, JW Marriott	Space Exploration’s Future and NGSS Engineering Practices Converge (p. 78)
5:00–6:00 PM	G	Petree Hall D, Conv. Center	National Earth Science Teachers Association (NESTA) Shares: Rock, Mineral, and Fossil Raffle (p. 80)

### Engineering, Technology, and the Application of Science: Sunday

8:00–9:00 AM	6–12	510, Conv. Center	To Build or Not to Build: Using Engineering, GIS, Exploration, and News Articles to Answer the Question (p. 84)
8:00–9:00 AM	6–8	506, Conv. Center	Helping You Integrate STEM with DiscoverE’s Future City Program (p. 84)
9:30–10:00 AM	6–8	408B, Conv. Center	STEM, PBL, and the Engineering Design Process (p. 87)
9:30–10:30 AM	3–12	503, Conv. Center	3.....1...Blast Off with Rocketry (p. 91)
9:30–10:30 AM	K–12	308 AB, Conv. Center	NASA Data for One, NASA Data for All! Use MY NASA DATA in Your Classroom from K–12 for All Your Earth Science Data Needs (p. 90)
9:30–10:30 AM	4–12	Kentia Hall L, Conv. Center	Lights, Camera, [STEM] Action! (p. 92)
9:30–10:30 AM	5–8	Kentia Hall M, Conv. Center	STEM-ulating Simulations (p. 92)
9:30–10:30 AM	5–C	512, Conv. Center	Energy Literacy: Intentional Resource Connections in a Changing Landscape (p. 89)
9:30–10:30 AM	K–12	510, Conv. Center	NGSS Meets NASA: Fearless Engineering for All Students (p. 89)
9:30–10:30 AM	K–5	Kentia Hall C, Conv. Center	The Making of a Makerspace (p. 90)
10:00–10:30 AM	9–12	502B, Conv. Center	STEM for ALL: Dream IT, Design IT, Develop IT (p. 92)
10:00–10:30 AM	K–3	515B, Conv. Center	Using 3D Printers in K–3 Boost Student Engagement and Learning (p. 92)
11:00 AM–12 Noon	5–12	309, Conv. Center	Polymers: Update Traditional Labs and Demos to Match the NGSS (p. 93)
11:00 AM–12 Noon	10–C	301 AB, Conv. Center	Building, Evaluating, and Using Systems Models (p. 95)
11:00 AM–12 Noon	K–5	Kentia Hall F, Conv. Center	“Cutting the Carbon” Environmental Engineering (p. 95)
11:00 AM–12 Noon	6–8	Kentia Hall N, Conv. Center	Middle School STEM: Adventures in Neuroscience, Bioengineering, and Biotechnology Through an Innovative Curriculum (p. 97)

### Life Science: Saturday

8:00–8:30 AM	10–C	Kentia Hall O, Conv. Center	Biology and Chemistry Experiments Reloaded with Cutting-Edge Technology (p. 16)
8:00–8:30 AM	K–8	505, Conv. Center	STEM with Sharks: Leveraging the Ocean to Teach <i>Next Generation Science Standards</i> (p. 15)
8:00–9:00 AM	5–8	Kentia Hall Q, Conv. Center	Science and Literacy: Ecosystems with Harry Potter (p. 22)
8:00–9:00 AM	6–8	Olympic 3, JW Marriott	ASTC-Sponsored Session: Integrating Real-World Science, NGSS Three Dimensions of Learning, and Technology To Promote Critical Thinking, Collaboration, and Communication (p. 19)
8:00–9:00 AM	4–12	Diamond Blrm. Salon 2, JW Marriott	Promoting Curiosity Through Outdoor Inquiry (p. 18)
8:00–9:00 AM	6–12	Diamond Blrm. Salon 6, JW Marriott	Cracking the Case: Integrating Biology and Engineering in Case Studies (p. 19)
8:00–9:00 AM	G	Platinum Blrm. Salon H, JW Marriott	Branching Out with STEM: Undergraduate Research as a Collaborative Model for K–12 Students Investigating GMOs (p. 17)
8:00–9:00 AM	K–3	Kentia Hall B, Conv. Center	Using Fictional Picture Books to Do Science: How Is It Possible? (p. 18)
8:00–9:00 AM	9–C	Kentia Hall S, Conv. Center	Hands-On Simulations of Bacterial Cell Transformation (p. 22)
8:00–9:00 AM	6–8	Kentia Hall R, Conv. Center	Learning About Ecosystem Management Through NGSS: Developing Solutions to Invasive Species Using Science and Engineering Practices (p. 22)
8:00–9:00 AM	3–6	Kentia Hall H, Conv. Center	Nature’s Superheroes: Integrating Science and Literacy Through Comics (p. 21)



8:00–9:00 AM	6–12	Diamond Blrm. Salon 7, JW Marriott	CRASH Science! Investigating the Dangers of Distracted Driving (p. 19)
8:00–9:00 AM	6–12	Platinum Blrm. Salon F, JW Marriott	Under the California Sun: Where Photosynthesis Happens! (p. 20)
8:00–9:00 AM	6–12	Kentia Hall P, Conv. Center	Studying Earth's Climate from Above (p. 22)
8:00–9:00 AM	7–C	Platinum Blrm. Salon G, JW Marriott	Using a 3D Triple Bottom Line Approach to Explore Global Biodiversity Using Web-Based Maps (p. 20)
8:00–9:30 AM	4–7	503, Conv. Center	Teach Biodiversity By Building Interactive Virtual Bio Domes! (p. 25)
8:00–9:30 AM	9–12	153B, Conv. Center	Bird Flu, Swine Flu, Pandemic Flu, Oh My! (p. 23)
8:00–9:30 AM	K–5	410, Conv. Center	BUGDORK! Using Insects to Engage Students and Inspire Learning (p. 24)
8:00–9:30 AM	9–C	404 AB, Conv. Center	Contagion! Track the Spread of Dangerous Disease (p. 24)
8:00–9:30 AM	9–C	408A, Conv. Center	How Do Diseases Circumvent the Immune System? Engaging HS Students (p. 24)
8:00–9:30 AM	7–C	402A, Conv. Center	Biology with Vernier (p. 23)
8:00–9:30 AM	5–8	303 AB, Conv. Center	The Secret Lives of Fish: Migration, Movement, and More (p. 23)
8:30–9:00 AM	K–8	505, Conv. Center	Integrating Engineering into Life Science Lessons (p. 26)
9:30–10:30 AM	2–12	Plaza 3, JW Marriott	Wonderful Watersheds! (p. 30)
9:30–10:30 AM	9–12	Kentia Hall S, Conv. Center	Anatomy Rocks! (p. 35)
9:30–10:30 AM	6–12	Kentia Hall P, Conv. Center	Science from the Ends of Earth: Nat Geo Fellows Bring Field Experiences into the Classroom (p. 31)
9:30–10:30 AM	10–C	West Hall B-5, Conv. Center	Real-World Three-Dimensional Environmental Science (p. 31)
9:30–10:30 AM	9–12	Platinum Blrm. Salon E, JW Marriott	Online Natural History Collections: Bringing Real-World Science into Every High School Classroom (p. 29)
9:30–10:30 AM	9–12	Olympic 3, JW Marriott	ASTC-Sponsored Session: Neuroscience and Society: Conversations Connecting Brain Development and Social Constructs (p. 32)
9:30–10:30 AM	G	Platinum Blrm. Salon A, JW Marriott	AMSE-Sponsored Session: George W. Carver Conversation Series on Diversity and Equity (p. 29)
9:30–10:30 AM	5–9	West Hall B-3, Conv. Center	Your Kids Can, Too! Scientific Argumentation for All Students (p. 35)
10:00–11:30 AM	6–C	153B, Conv. Center	A Visual Journey Through the Human Cell with Watercolor Landscapes (p. 37)
10:00–11:30 AM	9–12	408B, Conv. Center	Modeling Structure and Function with Help from Our Feathered Friends (p. 39)
10:00–11:30 AM	2–8	408A, Conv. Center	3-2-1 Blast Off! (p. 39)
10:00–11:30 AM	9–C	404 AB, Conv. Center	Investigate Photosynthesis and Cellular Respiration with Algae Beads (p. 39)
10:00–11:30 AM	6–9	518, Conv. Center	Modeling the Introduction of a New Species: NGSS Ecology (p. 40)
10:00–11:30 AM	9–12	503, Conv. Center	BIOZONE's NGSS Series for High School (p. 40)
10:00–11:30 AM	K–12	303 AB, Conv. Center	The Junior Duck Stamp Program: Integrating Science with Art (p. 38)
10:00–11:30 AM	4–6	301 AB, Conv. Center	Oh, Ick! Science Experiments Guaranteed to Gross You Out (p. 38)
11:00 AM–12 Noon	G	Petree Hall C, Conv. Center	Paul F-Brandwein Lecture: Nearby Wilderness, Novel Ecosystems, and Connecting to Nature (p. 42)
11:00 AM–12 Noon	4–6	Kentia Hall B, Conv. Center	Scientific Discoveries Shed Light on Karana's World—Integrating Science and Language Arts in <i>Island of the Blue Dolphins</i> (p. 44)
11:00 AM–12 Noon	9–12	Platinum Blrm. Salon B, JW Marriott	Aquaponics in the Classroom: Preparation for the Multidisciplinary STEM Workforce! (p. 47)
11:00 AM–12 Noon	7–11	Kentia Hall P, Conv. Center	Inquiry Beyond Four Walls: Earth Science Outdoor Learning (p. 48)
11:00 AM–12 Noon	8–C	Kentia Hall S, Conv. Center	The Great Diseases: Teaching Authentic Biomedical Science Using Case Studies Based on Primary Scientific Papers (p. 44)
11:00 AM–12 Noon	1–5	Kentia Hall G, Conv. Center	Who Is Your Champion? A Close Look at How Plant and Animal Structures Can Function to Help Solve a Problem (p. 48)
11:00 AM–12 Noon	8–C	Platinum Blrm. Salon C, JW Marriott	Using Google Docs to Collaboratively Scaffold Effective Formal Lab Write-Ups (p. 42)
11:00 AM–12 Noon	9–12	Plaza 2, JW Marriott	Implementing Guided Inquiry in the Sheltered English Immersion Science Classroom (p. 43)
11:00 AM–12 Noon	5–9	Kentia Hall Q, Conv. Center	Engaging Middle School Girls from Underrepresented Groups in Astronomy and Astrobiology Learning Using the Creative Arts (p. 44)

## Schedule at a Glance Life Science

11:00 AM–12 Noon	6–C	Platinum Blrm. Salon J, JW Marriott	The Helping Trio: Where Students Help Students Through Reading, Writing, Discussion, and Real-World Application (p. 43)
11:00 AM–12 Noon	11–12	West Hall B-5, Conv. Center	Long-Term Ecology Data Collection and Analysis Using Ecocolumns (p. 49)
11:00 AM–12 Noon	8–12	Diamond Blrm. Salon 6, JW Marriott	Memory, Attention, and Distraction (p. 46)
11:00 AM–12 Noon	6–8	Kentia Hall R, Conv. Center	Middle School Life Science Activities That Make Science Engaging and Fun (p. 48)
11:00 AM–12 Noon	6–12	Diamond Blrm. Salon 9, JW Marriott	Exploring Horse Evolution in Response to a Changing Climate Through an NGSS-Focused Curriculum (p. 46)
11:00 AM–12 Noon	P–1	Olympic 3, JW Marriott	ASTC-Sponsored Session: Telling the Stories of Science/ <i>Narración de Las Historias de la Ciencia</i> (p. 46)
12 Noon–1:30 PM	9–C	153B, Conv. Center	You’ve Got Some Nerve! Exploring Neuronal Communication (p. 51)
12 Noon–1:30 PM	9–12	408B, Conv. Center	Awesome Activities for an NGSS Classroom (Bio and Earth/Space) (p. 52)
12 Noon–1:30 PM	1–8	303 AB, Conv. Center	Educating on the Wild Side with the U.S. Fish and Wildlife Service (p. 51)
12 Noon–1:30 PM	5–8	403A, Conv. Center	Hands-On Integrated Science Activities for Middle School from Flinn Scientific (p. 52)
12:30–1:00 PM	5–9	506, Conv. Center	Turning Classroom Scientists into Citizen Scientists: Connecting Citizen Science and Secondary Research with FrogWatch USA (p. 53)
12:30–1:30 PM	9–12	Olympic 3, JW Marriott	ASTC-Sponsored Session: Mobile MAIA Science Lab: Using Dinosaurs and Cattle to Engage in Science and Math Concepts (p. 58)
12:30–1:30 PM	6–12	Kentia Hall R, Conv. Center	Photosynthesis: An Integrated, Hands-On Approach Supporting the NGSS and CCSS ELA (p. 59)
12:30–1:30 PM	P–8	West Hall B-2, Conv. Center	CESI-Sponsored Session: Combining Science with Art to Understand How We See Color—Using Negative Art for a Positive Effect (p. 59)
12:30–1:30 PM	1–6	Kentia Hall G, Conv. Center	Ecosystems: Where Should I Live? (p. 59)
12:30–1:30 PM	1–3	Kentia Hall F, Conv. Center	Using Biomimicry in the Early Grades: Meeting NGSS Practices (p. 58)
12:30–1:30 PM	6–12	Diamond Blrm. Salon 9, JW Marriott	Engineering Practices in the Life Sciences (p. 56)
12:30–1:30 PM	5–C	Diamond Blrm. Salon 2, JW Marriott	Mighty <i>Phragmites</i> : A Collaborative University/K–6 iSTEAM Ecosystem PBL Project (p. 56)
12:30–1:30 PM	6–C	Kentia Hall L, Conv. Center	Do You See What I See? (p. 59)
12:30–1:30 PM	6–12	Diamond Blrm. Salon 8, JW Marriott	Engineer Your Own Paper Microscope (p. 56)
1:00–1:30 PM	4–8	506, Conv. Center	Plant Invaders! An Interactive Game Exploring Invasive and Native Plants of California (p. 61)
1:00–1:30 PM	3–6	Kentia Hall B, Conv. Center	Save the Monarchs: A Fifth-Grade Yearlong Unit on Monarch Butterflies (p. 61)
2:00–3:00 PM	G	Platinum Blrm. Salon I, JW Marriott	Building Very Long-Term Concept Retention (p. 63)
2:00–3:00 PM	6–12	Diamond Blrm. Salon 8, JW Marriott	Teaching Photosynthesis and Cellular Respiration Three-Dimensionally with the Free Carbon TIME Curriculum (p. 65)
2:00–3:00 PM	P–6	Kentia Hall A, Conv. Center	Harvesting Equity: Seeds to Community (p. 64)
2:00–3:00 PM	6–12	Diamond Blrm. Salon 7, JW Marriott	Investigate then Interpret: Think Like a Scientist (p. 65)
2:00–3:00 PM	7–12	Diamond Blrm. Salon 1, JW Marriott	A Case of Unintentional Overdose (p. 65)
2:00–3:00 PM	9–C	515B, Conv. Center	How to Create a Network and Supply Chain to Support Collaborative Biotechnology Education (p. 64)
2:00–3:00 PM	6–12	Diamond Blrm. Salon 6, JW Marriott	Using Evidence and Data to Explain Scientific Phenomenon (p. 65)
2:00–3:30 PM	9–C	402A, Conv. Center	Human Physiology with Vernier (p. 68)
2:30–3:00 PM	6–8	514, Conv. Center	Designing Nests for Loons: A STEM Integration Unit (p. 69)
2:30–3:00 PM	10–12	West Hall B-5, Conv. Center	Student Data Collection, Modeling, and Analysis of Nutrient Levels and Algae Growth in Lake Champlain Vermont (p. 69)
3:00–6:00 PM	1–5	Santa Anita B, Westin	Hands-On Mathematics in Science Education (SC-16) (p. 69)
3:30–4:00 PM	3–7	Kentia Hall R, Conv. Center	Using a Chicken Coop and Raised Gardens to Teach Sustainability (p. 69)
3:30–4:30 PM	5–9	507, Conv. Center	Abstract Concepts for the Concrete Mind: Techniques and Lessons to Engage Middle School Students and Provide a Valuable Purpose for Learning (p. 72)
3:30–4:30 PM	G	Diamond Blrm. Salon 7, JW Marriott	Butterfly Bonanza (p. 73)

3:30–4:30 PM	6–C	Kentia Hall S, Conv. Center	Hands-On Human Evolution (p. 75)
3:30–4:30 PM	7–9	505, Conv. Center	Middle School Science and Algebra I Collaboration: Ohm’s Law as a Mathematical Model (p. 72)
3:30–4:30 PM	4–10	Diamond Blrm. Salon 10, JW Marriott	A New Tool for Using Smithsonian Resources to Support Science in the Classroom (p. 74)
3:30–4:30 PM	K–2	Kentia Hall E, Conv. Center	Made for the Shade: A SUN-sational Engineering Design Unit (p. 75)
3:30–4:30 PM	6–10	Diamond Blrm. Salon 9, JW Marriott	Modeling and the Three Dimensions of the NGSS in Middle School Genetics (p. 73)
4:00–4:30 PM	9–12	West Hall B-5, Conv. Center	Hawken’s Intensive Program Through a Science Lens (p. 76)
5:00–5:30 PM	7–12	501C, Conv. Center	A Consilient Approach to History and Science (p. 77)
5:00–5:30 PM	P–3	502A, Conv. Center	Poetry for Young Investigators (p. 77)
5:00–6:00 PM	6–9	Kentia Hall Q, Conv. Center	Explore Free Water Science Activities for Middle School Environmental Classrooms (p. 78)
5:00–6:00 PM	P–1	Kentia Hall A, Conv. Center	Knee-High to a Grasshopper: Nature Discovery Techniques for Young Learners (p. 78)
5:00–6:00 PM	6–C	Diamond Blrm. Salon 2, JW Marriott	Puzzling Theories: Teaching Nature of Science in a Biology Classroom (p. 79)
5:00–6:00 PM	8–12	Diamond Blrm. Salon 7, JW Marriott	Hands-On STEM Curriculum as a Way to Support Three-Dimensional Learning (p. 79)
5:00–6:00 PM	10–11	Olympic 3, JW Marriott	Project-Based Learning in Science to Reach All Learners (p. 79)
5:00–6:00 PM	9–12	West Hall B-5, Conv. Center	NGSS@NSTA Session: Finding Phenomenal Instructional Resources for High School Life Science (p. 81)
5:00–6:00 PM	6–10	Diamond Blrm. Salon 9, JW Marriott	Developing Science Practices: Constructing Explanations and Engaging in Argumentation (p. 79)
5:00–6:00 PM	9–C	Kentia Hall S, Conv. Center	Structure to Function: Traditional and Web-Based Exploration of a Rare Disease (p. 80)

**Life Science: Sunday**

8:00–9:00 AM	8–C	410, Conv. Center	Fighting Breast Cancer and Diabetes with STEM (p. 86)
8:00–9:00 AM	P–2	Kentia Hall C, Conv. Center	Get Caught Up in Our Science Web! (p. 86)
8:00–9:00 AM	5–8	507, Conv. Center	Engaging Students Beyond the Classroom: Classroom Gardens (p. 84)
8:00–9:00 AM	K–12	309, Conv. Center	The Three Dimensions of the Bad Seed (p. 85)
8:00–9:00 AM	5–12	515A, Conv. Center	Creating Life Science Assessment Tasks that Integrate Three-Dimensional Learning of the NGSS (p. 85)
8:00–9:00 AM	G	405, Conv. Center	Biophilia and Its Impact on Academic Achievement, Retention, and Intrinsic Motivation in the Middle School Classroom (p. 86)
9:30–10:00 AM	7–12	502B, Conv. Center	Differentiating for the Differentiated: Lab Experiences for General Level Life Science Students (p. 88)
9:30–10:30 AM	6–8	514, Conv. Center	Journey to El Yunque: Investigating the Effects of Hurricane Disturbance in Puerto Rico by Synthesizing Texts and Long-Term Data (p. 91)
9:30–10:30 AM	6–8	502A, Conv. Center	Where Will Yoni the Chickadee Raise His Family? (p. 89)
9:30–10:30 AM	9–12	301 AB, Conv. Center	Communicating Biodiversity Science to High School Students (p. 90)
9:30–10:30 AM	5–12	410, Conv. Center	Using Lionfish to Teach about Invasive Species (p. 91)
9:30–10:30 AM	8–12	406 AB, Conv. Center	iPhone, Microscope, and Instagram in Science Class (p. 91)
9:30–10:30 AM	5–12	405, Conv. Center	Team Science: Biodiversity, Population Genetics, and Interdependence in the 21st-Century Classroom (p. 91)
9:30–10:30 AM	5–8	Kentia Hall M, Conv. Center	STEM-ulating Simulations (p. 92)
9:30–10:30 AM	7–12	511C, Conv. Center	Citizen Science Ecosystem Biodiversity in the U.S. and Abroad (with Lemurs!) (p. 89)
9:30–10:30 AM	3–12	501 AB, Conv. Center	Connecting STEM to Threats from New and Emerging Diseases (p. 88)
9:30–10:30 AM	5–C	512, Conv. Center	Energy Literacy: Intentional Resource Connections in a Changing Landscape (p. 89)
11:00–11:30 AM	P–3	502A, Conv. Center	Growing a Garden of Science and Literacy (p. 93)

## Schedule at a Glance Life Science

11:00–11:30 AM	6–C	513, Conv. Center	The Teacher Institute for Evolutionary Science (TIES) (p. 93)
11:00–11:30 AM	1–6	Kentia Hall C, Conv. Center	Strategizing Classroom Talk to Enhance Learning in Elementary Science (p. 93)
11:00 AM–12 Noon	7–C	304 AB, Conv. Center	Patterns and Trends: Web-Based Exploration of Bird Populations from Local to Global (p. 95)
11:00 AM–12 Noon	9–12	405, Conv. Center	Bringing Biodiversity into the Classroom: Natural History Collections-Based Resources for High School Educators and Learners (p. 94)
11:00 AM–12 Noon	9–C	404 AB, Conv. Center	Guess the Chemical Compound! (p. 96)
11:00 AM–12 Noon	10–C	301 AB, Conv. Center	Building, Evaluating, and Using Systems Models (p. 95)
11:00 AM–12 Noon	6–8	511 AB, Conv. Center	Wading into Ecology: Using Aquatic Invertebrates to Explore Stream Ecosystems (p. 96)
11:00 AM–12 Noon	6–8	Kentia Hall N, Conv. Center	Middle School STEM: Adventures in Neuroscience, Bioengineering, and Biotechnology Through an Innovative Curriculum (p. 97)

## Physical Science: Saturday

8:00–8:30 AM	10–C	Kentia Hall O, Conv. Center	Biology and Chemistry Experiments Reloaded with Cutting-Edge Technology (p. 16)
8:00–9:00 AM	3–6	Kentia Hall D, Conv. Center	Sewable and Paper Circuits (p. 20)
8:00–9:00 AM	K–12	Platinum Blrm. Salon E, JW Marriott	Spark Students' Curiosity with Chemistry! (p. 17)
8:00–9:00 AM	6–12	Diamond Blrm. Salon 9, JW Marriott	Expanding Our Capacity for Observation: Prototyping Tools for Scientific Investigation with Arduino Electronics Boards (p. 19)
8:00–9:00 AM	K–8	502A, Conv. Center	Got Science? Get Literacy! (p. 20)
8:00–9:00 AM	6–8	West Hall B-3, Conv. Center	The Role of Students' Gestures in Constructing Explanations (p. 22)
8:00–9:00 AM	6–12	Diamond Blrm. Salon 7, JW Marriott	CRASH Science! Investigating the Dangers of Distracted Driving (p. 19)
8:00–9:30 AM	3–8	402B, Conv. Center	Wind and Solar Energy Basics with Vernier (p. 23)
8:00–9:30 AM	3–5	408B, Conv. Center	Engineering for the NGSS Upper Elementary Science Classroom (p. 24)
8:00–9:30 AM	6–C	406 AB, Conv. Center	Using the Classic Demonstration to Engage Students in Science Talk (p. 24)
8:00–10:00 AM	P–8	152, Conv. Center	CESI-Sponsored Session: Using Toys to Teach Physics Share-a-Thon (p. 25)
8:00–11:00 AM	3–8	San Gabriel A, Westin	Fostering a Science-Driven Language and Literacy Learning Environment (SC-11) (p. 25)
8:30–9:00 AM	10–11	Kentia Hall O, Conv. Center	The Use of a Role-Playing Game in the Teaching of Chemistry (p. 26)
9:30–10:30 AM	4–C	Platinum Blrm. Salon B, JW Marriott	Electric Art (p. 32)
9:30–10:30 AM	P–12	Atrium 3, JW Marriott	NSELA-Sponsored Session: Got Science? Get Literacy! (p. 29)
9:30–10:30 AM	4–6	Kentia Hall M, Conv. Center	Robotics and Physical Science (p. 31)
9:30–10:30 AM	9–12	Plaza 1, JW Marriott	Using Districtwide Teacher Teams to Build Foundations for High School NGSS Courses (p. 30)
9:30–10:30 AM	7–12	Kentia Hall O, Conv. Center	Polymers: Basics for the Science Classroom (p. 31)
9:30–10:30 AM	6–12	Kentia Hall P, Conv. Center	Science from the Ends of Earth: Nat Geo Fellows Bring Field Experiences into the Classroom (p. 31)
9:30–10:30 AM	6–8	504, Conv. Center	Pinball Machines and PBL (p. 30)
9:30–10:30 AM	7–12	Kentia Hall N, Conv. Center	Mixing Colored Lights and Pigments: RGB vs. CMYK—a STEAM Approach (p. 35)
9:30–10:30 AM	7–C	Platinum Blrm. Salon J, JW Marriott	The Magic of Inquiry (p. 30)
9:30–10:30 AM	3–8	Kentia Hall F, Conv. Center	Water Wheel Challenge: An Engineering Design Lesson for Grades 3–8 Students (p. 34)
10:00–10:30 AM	4–12	Platinum Blrm. Salon H, JW Marriott	A Simple New Design for a Microgravity Drop Box for Classroom Use (p. 36)
10:00–11:30 AM	2–8	408A, Conv. Center	3-2-1 Blast Off! (p. 39)
10:00–11:30 AM	6–C	153B, Conv. Center	A Visual Journey Through the Human Cell with Watercolor Landscapes (p. 37)
10:00–11:30 AM	3–6	402B, Conv. Center	Elementary Science with Vernier (p. 38)
10:00–11:30 AM	7–12	153C, Conv. Center	The Power of Game-Based Learning in the Science Classroom (p. 37)
10:00–11:30 AM	3–C	402A, Conv. Center	Integrating Chromebook with Vernier Technology (p. 38)

10:00–11:30 AM	4–6	301 AB, Conv. Center	<i>Oh, Ick!</i> Science Experiments Guaranteed to Gross You Out (p. 38)
11:00–11:30 AM	6–12	Kentia Hall N, Conv. Center	Teaching Chemistry Content with Projects (p. 41)
11:00–11:30 AM	7–11	506, Conv. Center	Simple Machines Design Challenge for Middle School Science and Math Students (p. 41)
11:00 AM–12 Noon	9–12	Kentia Hall O, Conv. Center	Conservation of Mass...and Literacy! (p. 48)
11:00 AM–12 Noon	8–C	Platinum Blrm. Salon C, JW Marriott	Using Google Docs to Collaboratively Scaffold Effective Formal Lab Write-Ups (p. 42)
11:00 AM–12 Noon	4–6	Kentia Hall A, Conv. Center	Exploring Matter and Energy in Grade 5 (p. 44)
11:00 AM–12 Noon	9–12	Platinum Blrm. Salon B, JW Marriott	Aquaponics in the Classroom: Preparation for the Multidisciplinary STEM Workforce! (p. 47)
11:00 AM–12 Noon	6–12	501C, Conv. Center	Getting Evidence of Student Understanding (p. 43)
11:00 AM–12 Noon	4–C	Platinum Blrm. Salon D, JW Marriott	Groovy Sounds: NGSS Investigations into Sound (p. 47)
11:00 AM–12 Noon	5–8	514, Conv. Center	The House Project: A Science-Math Collaborative, Cross-Curricular Design Project (p. 44)
11:00 AM–12 Noon	K–8	Kentia Hall M, Conv. Center	Force and Motion: An Integrated K–8 Hands-On Approach Supporting the NGSS and CCSS ELA (p. 48)
11:00 AM–12 Noon	5–9	Kentia Hall Q, Conv. Center	Engaging Middle School Girls from Underrepresented Groups in Astronomy and Astrobiology Learning Using the Creative Arts (p. 44)
11:00 AM–12 Noon	6–C	Platinum Blrm. Salon J, JW Marriott	The Helping Trio: Where Students Help Students Through Reading, Writing, Discussion, and Real-World Application (p. 43)
11:00 AM–12 Noon	7–11	Kentia Hall P, Conv. Center	Inquiry Beyond Four Walls: Earth Science Outdoor Learning (p. 48)
12 Noon–1:30 PM	9–C	402A, Conv. Center	Chemistry with Vernier (p. 51)
12 Noon–1:30 PM	9–C	402B, Conv. Center	Physics with Vernier (p. 52)
12 Noon–1:30 PM	5–8	403A, Conv. Center	Hands-On Integrated Science Activities for Middle School from Flinn Scientific (p. 52)
12:30–1:00 PM	K–5	Kentia Hall B, Conv. Center	Energy and Matter...Start with Student Thinking! (p. 53)
12:30–1:30 PM	9–12	Kentia Hall O, Conv. Center	Slingshot Physics (p. 59)
12:30–1:30 PM	2–C	Kentia Hall K, Conv. Center	Composing Science: A Facilitator's Guide to Writing in the Inquiry Classroom (p. 59)
12:30–1:30 PM	6–12	Diamond Blrm. Salon 8, JW Marriott	Engineer Your Own Paper Microscope (p. 56)
12:30–1:30 PM	9–11	Platinum Blrm. Salon B, JW Marriott	The Game Is Afoot! Holmes, Literacy, and NGSS in the Secondary Physical Science Classroom (p. 58)
12:30–1:30 PM	P–8	West Hall B-2, Conv. Center	CESI-Sponsored Session: Combining Science with Art to Understand How We See Color—Using Negative Art for a Positive Effect (p. 59)
2:00–2:30 PM	9–11	Kentia Hall O, Conv. Center	Evaluate Modeling Chemistry with EQuIP (p. 61)
2:00–3:00 PM	10–12	Olympic 1, JW Marriott	Developing the Postulates of Special Relativity in Group Discussions (p. 62)
2:00–3:00 PM	9–C	Kentia Hall N, Conv. Center	Develop a Scientific Model of the Atomic Structure from Experimental Data to Explain Phenomena (p. 67)
2:00–3:00 PM	6–12	Kentia Hall M, Conv. Center	Electrifying Ideas for Teaching Energy (p. 66)
2:00–3:00 PM	P–12	Diamond Blrm. Salon 2, JW Marriott	STEM Learning Through Cantilever Span Design and Construction (p. 65)
2:00–3:00 PM	6–8	Kentia Hall Q, Conv. Center	Is It Hot in Here? Climate Change Lessons for Intermediate Students (p. 67)
2:00–3:00 PM	7–8	West Hall B-4, Conv. Center	Analog Digital in 3D (p. 67)
2:00–3:30 PM	6–8	304C, Conv. Center	Tackle Renewable Energy with LEGO® Education (p. 68)
2:00–3:30 PM	6–8	518, Conv. Center	Make a Wet Cell Battery (p. 68)
2:30–3:00 PM	9–12	Kentia Hall O, Conv. Center	How Can NGSS Fit in My Physics Classroom? (p. 69)
3:00–6:00 PM	1–5	Santa Anita B, Westin	Hands-On Mathematics in Science Education (SC-16) (p. 69)
3:30–4:30 PM	7–9	505, Conv. Center	Middle School Science and Algebra I Collaboration: Ohm's Law as a Mathematical Model (p. 72)
3:30–4:30 PM	5–9	507, Conv. Center	Abstract Concepts for the Concrete Mind: Techniques and Lessons to Engage Middle School Students and Provide a Valuable Purpose for Learning (p. 72)

## Schedule at a Glance Physical Science

3:30–4:30 PM	P–2	Kentia Hall M, Conv. Center	Sound and Waves: An Integrated K–8 Hands-On Approach Supporting the NGSS and CCSS ELA (p. 75)
3:30–4:30 PM	P–2	Kentia Hall F, Conv. Center	Ramps and Pathways: An Integrative STEM and Literacy Activity (p. 75)
3:30–4:30 PM	6–8	513, Conv. Center	Matter Matters: A Three-Dimensional Middle School Unit (p. 72)
3:30–4:30 PM	K–2	Kentia Hall E, Conv. Center	Made for the Shade: A SUN-sational Engineering Design Unit (p. 75)
3:30–4:30 PM	6–C	Platinum Blrm. Salon G, JW Marriott	Inquiry-Based Activities for Middle School and High School Physics Classrooms (p. 74)
3:30–4:30 PM	9–12	Platinum Blrm. Salon B, JW Marriott	Using Computer Science to Engage Students and Teach Physics (p. 74)
3:30–4:30 PM	4–10	Diamond Blrm. Salon 10, JW Marriott	A New Tool for Using Smithsonian Resources to Support Science in the Classroom (p. 74)
3:30–4:30 PM	9–12	Kentia Hall O, Conv. Center	Using Modeling Practices to Create Optimal Learning Moments in High School Project-Based Physical Science Units (p. 75)
3:30–4:30 PM	P–3	Kentia Hall A, Conv. Center	Let's Get Physical—From Force and Friction to Water and Weather (p. 74)
3:30–4:30 PM	3–8	Kentia Hall H, Conv. Center	Crosscutting NASA's Journey to Mars with NGSS in Grades 3–8 (p. 75)
5:00–5:30 PM	P–3	502A, Conv. Center	Poetry for Young Investigators (p. 77)
5:00–5:30 PM	5–8	Kentia Hall M, Conv. Center	Let's Get Physical! Engineering Design Challenges for Middle School Physical Science (p. 77)
5:00–5:30 PM	9–12	Kentia Hall O, Conv. Center	Using the 5E Model to Implement the NGSS in the Chemistry Classroom (p. 77)
5:00–6:00 PM	K–6	West Hall B-4, Conv. Center	Rubric First: Engineers Start with Contracts Before Making Blueprints (p. 80)
5:00–6:00 PM	1–5	Kentia Hall F, Conv. Center	Energizing Science Learning with Thinking Maps! (p. 80)
5:00–6:00 PM	10–11	Olympic 3, JW Marriott	Project-Based Learning in Science to Reach All Learners (p. 79)
5:00–6:00 PM	8–12	Diamond Blrm. Salon 7, JW Marriott	Hands-On STEM Curriculum as a Way to Support Three-Dimensional Learning (p. 79)
5:30–6:00 PM	K–6	Kentia Hall B, Conv. Center	Improving Learning with Science Practices in the Elementary Classroom (p. 81)

### Physical Science: Sunday

8:00–8:30 AM	9–12	304 AB, Conv. Center	Modeling in Chemistry: Learn to Walk the Scientific Runway (p. 83)
8:00–9:00 AM	9–C	409 AB, Conv. Center	An Authentic Research Experience for Teachers: The NASA/IPAC Teacher Research Program (NITARP) (p. 84)
8:00–9:00 AM	P–2	Kentia Hall E, Conv. Center	Young Children Investigate and Engineer Sound Through STEM (p. 87)
8:00–9:00 AM	1–12	308 AB, Conv. Center	NGSS Physical Science Fun and Inquiry Across the Grade Bands (p. 85)
8:00–9:00 AM	9–12	404 AB, Conv. Center	Exploring Visible and Infrared Light and Energy in a Three-Dimensional Learning Setting (p. 85)
8:00–9:00 AM	G	403A, Conv. Center	Awesome Airbags: Exploring the Design Process Through the NGSS Lens (p. 83)
8:30–9:00 AM	9–12	304 AB, Conv. Center	Arguments in Chemistry Can Be a Good Thing! (p. 87)
9:30–10:30 AM	9–12	404 AB, Conv. Center	Grocery Store Chemistry (p. 90)
9:30–10:30 AM	5–8	Kentia Hall M, Conv. Center	STEM-ulating Simulations (p. 92)
9:30–10:30 AM	K–12	308 AB, Conv. Center	NASA Data for One, NASA Data for All! Use MY NASA DATA in Your Classroom from K–12 for All Your Earth Science Data Needs (p. 90)
9:30–10:30 AM	K–8	Kentia Hall J, Conv. Center	I See the Light! An Introduction to Basic Properties of Light (p. 92)
9:30–10:30 AM	G	403A, Conv. Center	Focusing on Physical Science Classes: Creating a Pipeline for Interest in STEM-Related Classes for Females and Underrepresented Minorities (p. 88)
9:30–10:30 AM	5–C	512, Conv. Center	Energy Literacy: Intentional Resource Connections in a Changing Landscape (p. 89)
9:30–10:30 AM	4–10	513, Conv. Center	SOFIA Airborne Astronomy (p. 89)
9:30–10:30 AM	P–5	Kentia Hall B, Conv. Center	Magnetics (p. 90)
11:00 AM–12 Noon	9–12	Kentia Hall L, Conv. Center	Dixie® Cup Physics (p. 97)

11:00 AM–12 Noon	9–C	404 AB, Conv. Center	Guess the Chemical Compound! (p. 96)
11:00 AM–12 Noon	9–12	Kentia Hall H, Conv. Center	Know Nuclear! (p. 96)
11:00 AM–12 Noon	6–8	Kentia Hall N, Conv. Center	Middle School STEM: Adventures in Neuroscience, Bioengineering, and Biotechnology Through an Innovative Curriculum (p. 97)

**General Science Education: Saturday**

8:00–8:30 AM	K–5	Kentia Hall G, Conv. Center	Unpacking a K–5 Inquiry-Based Science Investigation with a Focus on Engaging English Language Learners (p. 15)
8:00–9:00 AM	G	Platinum Blrm. Salon I, JW Marriott	Are Students Scientists? (p. 17)
8:00–9:00 AM	K–6	Kentia Hall E, Conv. Center	Helping ALL K–6 Students Understand the Impact of STEM and the Essential Integration of All STEM Disciplines: Explorations with Physical Structures and Everyday Household Objects (p. 18)
8:00–9:00 AM	K–8	Kentia Hall L, Conv. Center	From Decomposers to Composers—Teaching Writing in Science (p. 18)
8:00–9:00 AM	7–12	Gold Blrm. Salon 2, JW Marriott	Advanced Student Thinking through Interactive Notebooks with NGSS (p. 16)
8:00–9:00 AM	2–6/C	Olympic 1, JW Marriott	Helping Students Engage in Public Discourse about Change in Science and Engineering Thought Over Time (p. 16)
8:00–9:00 AM	P–5	Kentia Hall A, Conv. Center	Early Childhood Science Experiences: Laying the Foundation for More Complex Science Practices in the Future (p. 18)
8:00–9:00 AM	9–12	Plaza 1, JW Marriott	Interactive Science Notebooks for Your High School Science Course (p. 17)
8:00–9:00 AM	5–12	Kentia Hall K, Conv. Center	Using Phenomena to Support Literacy Demands of the NGSS (p. 21)
8:00–9:00 AM	9–12	Plaza 2, JW Marriott	Flipping the Classroom: The Things They Don’t Tell You (p. 17)
8:00–9:00 AM	8–12	Diamond Blrm. Salon 8, JW Marriott	Supporting Leadership Development in Science Educators (p. 19)
8:00–9:00 AM	P–2	Kentia Hall C, Conv. Center	Science in the Early Childhood Classroom (p. 20)
8:00–9:00 AM	3–C	Platinum Blrm. Salon A, JW Marriott	AMSE-Sponsored Session: Moving Equity Forward in Science Classrooms: Strategies for Developing Justice-Centered Science Teacher Learning Communities (p. 16)
8:00–9:00 AM	6–12	Diamond Blrm. Salon 3, JW Marriott	NSTA Press® Session: Planning Three-Dimensional Formative Assessments with the Feedback Loop (p. 18)
8:00–9:00 AM	2–8/C	Theatre (411), Conv. Center	Igniting Student Interest and Imagination with Harry Potter Episodes (p. 18)
8:00–9:00 AM	9–12	515B, Conv. Center	The Science Collective: Project-Based Learning as a Multi-Science Teacher (p. 17)
8:00–9:00 AM	K–12	515A, Conv. Center	Creating Inquiry Lessons Using NGSS (p. 20)
8:00–9:00 AM	P–3	Kentia Hall F, Conv. Center	Common Scientific Misconceptions: An Accurate, Exciting, and Interactive Approach to Teaching Fundamental Concepts in the Primary Grades (p. 20)
8:00–9:00 AM	G	507, Conv. Center	Discover the NGSS: An Interactive Exploration of the <i>Next Generation Science Standards</i> (p. 17)
8:00–9:30 AM	6–8	403B, Conv. Center	Science Bits: The 17-Time Digital Curriculum Award-Winner That Enhances Learning with Understanding (p. 24)
8:00–9:30 AM	6–12	511 AB, Conv. Center	Zombie Apocalypse! (p. 25)
8:00–9:30 AM	P–12	409 AB, Conv. Center	Become a Nat Geo–Certified Educator (p. 24)
8:00–9:30 AM	4–12	301 AB, Conv. Center	Outdoor Education in Southern California (p. 23)
8:00–11:00 AM	1–5	Grand Hope Park, Off-site	NGSS Meets the Outdoors: Teaching Elementary Science Outside (SC-14) (p. 25)
8:00–11:00 AM	K–5	Santa Anita B, Westin	Elementary Curriculum Development for the NGSS: How to Integrate the Three Dimensions of Learning into an Elementary Classroom (SC-13) (p. 25)
8:30–9:00 AM	3–8	506, Conv. Center	Schoolwide STEM Implementation (p. 26)
9:30–10:00 AM	6–8	514, Conv. Center	Fostering Science Literacy Through Discussion (p. 27)
9:30–10:00 AM	4–8	506, Conv. Center	Equity Through Instruction: Differentiation Labs (p. 27)
9:30–10:30 AM	P–5	Kentia Hall E, Conv. Center	STEMifying Storybooks: A Planning Guide Using Storybooks to Integrate Science and Engineering in Elementary Classrooms (p. 34)

## Schedule at a Glance General Science Education

9:30–10:30 AM	K–12	Platinum Blrm. Salon I, JW Marriott	Equity Within NGSS: Strategies for Culturally Responsive Teaching in the Science Classroom (p. 29)
9:30–10:30 AM	6–12	501C, Conv. Center	How to Mentor Students in Science Fair #novolcanoes (p. 30)
9:30–10:30 AM	10–C	Olympic 1, JW Marriott	Real Scientific Research in the High School Classroom (p. 29)
9:30–10:30 AM	5–9	Kentia Hall R, Conv. Center	Going MAD at the Zoo: Bridging Mean Absolute Deviation and Math Standards to Animal Behavior Field Studies (p. 35)
9:30–10:30 AM	G	Platinum Blrm. Salon G, JW Marriott	Developing Interdisciplinary Assessments (p. 32)
9:30–10:30 AM	6–12	Diamond Blrm. Salon 7, JW Marriott	Improving Instruction through Better Assessments: A Framework for Teacher-Leaders (p. 32)
9:30–10:30 AM	4–5	Kentia Hall C, Conv. Center	Teaching and Learning—Outdoors and Active! (p. 34)
9:30–10:30 AM	6–C	Diamond Blrm. Salon 2, JW Marriott	A Window into Student Sense-Making (p. 32)
9:30–10:30 AM	6–12	Diamond Blrm. Salon 9, JW Marriott	Promoting a: Revision Strategies for Improving Students' Explanatory Writing (p. 32)
9:30–10:30 AM	P–6	502A, Conv. Center	Urban-Based Partnerships to Support the K–6 Foundations of CCSS ELA and NGSS (p. 30)
9:30–10:30 AM	P–12	507, Conv. Center	Before and After Retirement: Practicalities and Possibilities (p. 30)
9:30–10:30 AM	5–8	513, Conv. Center	Argumentation Toolkit: Resources for Developing a Classroom Culture for Scientific Argumentation (p. 31)
9:30–11:00 AM	K–12	151, Conv. Center	NGSS@NSTA Share-a-Thon (p. 36)
9:30 AM–1:30 PM	G	Booth #435, Exhibit Hall	Hydrogen Horizon Automotive Challenge (p. 36)
10:00–10:30 AM	K–6	Kentia Hall A, Conv. Center	Inquiry Learning in Elementary Science Classrooms: A High School–Elementary Collaboration (p. 37)
10:00–10:30 AM	K–8	506, Conv. Center	Using Formative Assessment and UDL: Strategies to Support All Students' Learning of Properties of Matter (p. 36)
10:00–10:30 AM	6–8	514, Conv. Center	Scientific Literacy—From Idea to Implementation with Middle School Students (p. 37)
10:00–11:30 AM	9–12	406 AB, Conv. Center	Three Steps to AP Exam Success (p. 39)
10:00–11:30 AM	5–8	153A, Conv. Center	Performance Assessments—Engaging and Fun! (p. 37)
10:00–11:30 AM	K–8	409 AB, Conv. Center	Assess the NGSS: Formative Assessment Strategies for Grades K–8 (p. 39)
10:00–11:30 AM	6–12	403B, Conv. Center	How the Teen Brain Learns (p. 39)
10:00–11:30 AM	K–5	305, Conv. Center	Engaging Your Students in 3D Problem-Based Learning: Making It Happen (p. 38)
11:00–11:30 AM	C	Olympic 1, JW Marriott	The NGSS from Theory to Practice (p. 41)
11:00–11:30 AM	4–12	Plaza 1, JW Marriott	NGSS and Global Collaboration in the Science Classroom (p. 41)
11:00–11:30 AM	G	Plaza 3, JW Marriott	Form, Storm, Norm, and Conform: Tips for STEM Partner Management (p. 41)
11:00–11:30 AM	5–8	513, Conv. Center	STEM on a Shoestring: How to Hit the Standards When You Have No Funding! (p. 41)
11:00 AM–12 Noon	6–8	Platinum Blrm. Salon A, JW Marriott	AMSE-Sponsored Session: Unpacking the Wonders of a Tropical Excursion in Belize: An Educator's Perspective (p. 47)
11:00 AM–12 Noon	1–12	502B, Conv. Center	How Engineering Practices Differentiate for Students with Learning Disabilities (p. 43)
11:00 AM–12 Noon	K–8	Diamond Blrm. Salon 3, JW Marriott	NSTA Press® Session: <i>Outdoor Science: A Practical Guide</i> (p. 42)
11:00 AM–12 Noon	K–12	Atrium 3, JW Marriott	NSELA-Sponsored Session: Leadership Strategies for Ensuring Each Student Has a STEM Future (p. 42)
11:00 AM–12 Noon	3–8	515B, Conv. Center	Using Robots to Teach Science, Math, Art, and Language Arts (p. 44)
11:00 AM–12 Noon	P–12	515A, Conv. Center	Analyzing and Adapting Curriculum Materials to Better Support Three-Dimensional Teaching and Learning (p. 47)
11:00 AM–12 Noon	6–C	Kentia Hall K, Conv. Center	Zombies in the Secondary Classroom (p. 48)
11:00 AM–12 Noon	6–9	West Hall B-3, Conv. Center	Building Models the NGSS Way (p. 48)
11:00 AM–12 Noon	6–10	Diamond Blrm. Salon 7, JW Marriott	Are Three Trials Enough? Analyzing Investigation Data with Large Variation (p. 46)
11:00 AM–12 Noon	4–8	Kentia Hall H, Conv. Center	Success for Struggling Students (p. 48)
11:00 AM–12 Noon	K–12	West Hall B-2, Conv. Center	Science Pedagogy Toolkit: Support for NGSS Classrooms (p. 46)
11:00 AM–12 Noon	K–12	Platinum Blrm. Salon I, JW Marriott	Evaluating Resources for Lessons That Fit the NGSS (p. 43)



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11:00 AM–12 Noon	1–5	Kentia Hall D, Conv. Center	Come to Organize a Science Fair in Your Primary School! (p. 47)
11:00 AM–12 Noon	K–5	Kentia Hall F, Conv. Center	Engage, Explore, and So Much More: K–5 Science Literacy (p. 47)
11:00 AM–12 Noon	6–C	Diamond Blrm. Salon 2, JW Marriott	STEM Learning for All Students: An Integrated Teaching Model (p. 46)
11:00 AM–12 Noon	K–8	Kentia Hall L, Conv. Center	STEM + Music = A Match Made in an Integrated Classroom (p. 44)
11:00 AM–12 Noon	9–12	Platinum Blrm. Salon E, JW Marriott	Advancing Scientific Literacy with Lesson Plans that Meet the CCSS and NGSS (p. 42)
11:00 AM–12 Noon	1–12	505, Conv. Center	Environmental Projects Through Community Connections (p. 43)
11:00–12:30 PM	7–C	152, Conv. Center	High School Hands-On Hodge-Podge Share-a-Thon (p. 50)
11:30 AM–12 Noon	5–C	Plaza 3, JW Marriott	NGSS Three-Dimensional Learning: Using an Interactive Planning Matrix to Plan for Enhanced Learning (p. 50)
11:30 AM–12 Noon	6–12	Kentia Hall N, Conv. Center	Claim, Evidence, Reasoning: A Strategy for Simplifying Lab Report Writing (p. 51)
11:30 AM–12 Noon	5–8	513, Conv. Center	STEM Ahead (p. 50)
11:30 AM–12 Noon	K–8	506, Conv. Center	STEM for All: A Collaboration Between K–12 Public Schools and a College of Education (p. 50)
11:30 AM–12 Noon	C	Olympic 1, JW Marriott	An Online Science Methods Course: Successes and Challenges (p. 50)
12 Noon–1:30 PM	6–12	511 AB, Conv. Center	Using Maggots, Flies, and Flesh to Solve a Mystery! (p. 52)
12:30–1:00 PM	4–12	Plaza 3, JW Marriott	Connecting CCSS ELA and NGSS Through Close Reading (p. 53)
12:30–1:30 PM	P–5	Kentia Hall E, Conv. Center	Use of Existing NASA STEM Lessons to Support NGSS Engineering Practices (p. 58)
12:30–1:30 PM	7–12	Diamond Blrm. Salon 7, JW Marriott	Introduction to POGIL (p. 56)
12:30–1:30 PM	6–8	West Hall B-3, Conv. Center	Keepin' It Real: How to Plan Three-Dimensional Lessons That Hook Students on Real Problems (p. 60)
12:30–1:30 PM	9–C	Olympic 1, JW Marriott	The Science Behind Advanced Coursework in High School (p. 54)
12:30–1:30 PM	P–12	Platinum Blrm. Salon D, JW Marriott	Update on the <i>California Science Curriculum Framework</i> (p. 54)
12:30–1:30 PM	6–8	504, Conv. Center	Science Fair 101: A Beginner's Guide to Creating a Fabulous Science Fair! (p. 55)
12:30–1:30 PM	6–12	Platinum Blrm. Salon F, JW Marriott	Providing Equitable Learning Experiences for ELLs in Science (p. 58)
12:30–1:30 PM	K–8	Kentia Hall H, Conv. Center	School Science Partnerships: How the Peggy Notebaert Nature Museum Builds a Schoolwide Understanding of NGSS (p. 59)
12:30–1:30 PM	6–12	Diamond Blrm. Salon 6, JW Marriott	Using Productive Talk in Middle School and High School Classes to Get the Most Out of Classroom Discussions (p. 56)
12:30–1:30 PM	6–8	West Hall B-4, Conv. Center	Why Does Our Whole Neighborhood Smell Like Grandma's Cookies Fresh Out of the Oven? Developing and Using Models to Explain Interesting Phenomena (p. 60)
12:30–1:30 PM	K–6	502A, Conv. Center	Engaging All Learners in Inquiry Through A Model of Shared Language (p. 55)
12:30–1:30 PM	K–12	507, Conv. Center	The Shell Science Teaching Award: Fueling Success with Students (p. 55)
12:30–1:30 PM	6–12	515A, Conv. Center	NGSS 3D Implementation: Tools for Middle School and High School Teachers (p. 58)
12:30–1:30 PM	G	515B, Conv. Center	Engaging Multilingual Students and Their Families in STEM (p. 55)
12:30–1:30 PM	K–5	Diamond Blrm. Salon 3, JW Marriott	NSTA Press® Session: <i>Picture-Perfect Science Lessons: Using Picture Books to Guide Inquiry, K–5</i> (p. 56)
12:30–1:30 PM	P–12	Diamond Blrm. Salon 1, JW Marriott	NSTA Press® Session: <i>Be a Winner! A Science Teacher's Guide to Writing Successful Grant Proposals</i> (p. 54)
12:30–1:30 PM	G	Platinum Blrm. Salon A, JW Marriott	Equity, Leadership, and Change (p. 54)
12:30–1:30 PM	3–9	505, Conv. Center	Using SMILE (Stanford Mobile Inquiry-Based Learning Environment) to Facilitate Student-Generated Questioning Practices in Science Classrooms (p. 55)
12:30–1:30 PM	6–8	514, Conv. Center	"We Already Learned This!" Incorporating NGSS in Middle Learning Progressions (p. 55)
12:30–1:30 PM	4–11	Platinum Blrm. Salon H, JW Marriott	Learn Math and Science Through the Built Environment (p. 54)
12:30–1:30 PM	9–12	Platinum Blrm. Salon E, JW Marriott	Addressing the Needs of a Classroom of Students with IEPs (p. 54)
12:30–1:30 PM	6–12	501C, Conv. Center	DISSECT: DIScover SciEnce through Computational Thinking (p. 55)
12:30–1:30 PM	6–C	Platinum Blrm. Salon C, JW Marriott	Standards-Based Grading Strategies and Solutions (p. 54)

## Schedule at a Glance General Science Education

12:30–1:30 PM	P–2	Kentia Hall D, Conv. Center	NSTA Press® Session: Bringing the S-T-E-M Together in Early Childhood Using Science and Engineering Practices (p. 58)
12:30–1:30 PM	G	Theatre (411), Conv. Center	Featured Presentation: Reenvisioning STEM Education: Transcending Boundaries to Realize the Vision of Inclusion, Diversity, and Equity in STEM Fields (p. 53)
12:30–1:30 PM	3–10	Platinum Blrm. Salon I, JW Marriott	STEM X Academy: Turning Inspiration to Classroom Innovation (p. 54)
12:30–2:30 PM	G	Gold Blrm. Salon 3, JW Marriott	Multicultural/Equity Share-a-Thon (p. 60)
1:00–1:30 PM	5–8	513, Conv. Center	Girls Just Want to Do STEM (p. 61)
1:00–1:30 PM	3–C	Plaza 3, JW Marriott	Teaching Vivid Vocabulary in Your Science Classroom (p. 61)
2:00–2:30 PM	1–5	Kentia Hall B, Conv. Center	Science Without Literacy = A Beaker Half Empty (p. 61)
2:00–2:30 PM	6–9	514, Conv. Center	How to Engage Middle School Students in Evidence-Based Argumentation (p. 61)
2:00–3:00 PM	1–12	Platinum Blrm. Salon C, JW Marriott	STEAM Festivals: Improving Your Science Fair (p. 63)
2:00–3:00 PM	3–12	Platinum Blrm. Salon B, JW Marriott	Facilitating NGSS Practices Through Citizen Science (p. 66)
2:00–3:00 PM	K–5	Kentia Hall G, Conv. Center	Facilitating Learning in the K–5 Classroom (p. 66)
2:00–3:00 PM	7–12	Diamond Blrm. Salon 9, JW Marriott	Connecting Engineering and Socio-Scientific Issues in School Classrooms (p. 65)
2:00–3:00 PM	P	West Hall B-2, Conv. Center	Engaging 21st-Century Learners: STEM in PreK and TK Classrooms (p. 67)
2:00–3:00 PM	3–C	Kentia Hall K, Conv. Center	Argue Like a Scientist #SocraticSeminars (p. 66)
2:00–3:00 PM	6–12	152, Conv. Center	STEM Share-a-Thon (p. 63)
2:00–3:00 PM	G	507, Conv. Center	Write for NSTA's Journals (p. 64)
2:00–3:00 PM	3–C	515A, Conv. Center	Using Scientific Phenomena to Understand the Three Dimensions of the NGSS (p. 66)
2:00–3:00 PM	K–6	Olympic 3, JW Marriott	NSTA Press® Session: Inside or Out: The Perfect Place for Connecting Outdoor Science and Children's Trade Books (p. 65)
2:00–3:00 PM	G	Platinum Blrm. Salon A, JW Marriott	The Top 10 Safety Issues in the Science Classroom/Laboratory You Need to Know! (p. 62)
2:00–3:00 PM	G	Platinum Blrm. Salon E, JW Marriott	A Peek at PEEC: Evaluating Instructional Materials for NGSS (p. 63)
2:00–3:00 PM	9–C	502B, Conv. Center	How and Why STEM Career Interest Changes in High School (p. 64)
2:00–3:00 PM	G	Diamond Blrm. Salon 10, JW Marriott	Technology in the Science Classroom (p. 62)
2:00–3:00 PM	7–12	501C, Conv. Center	Science in the City and Around the Globe (p. 64)
2:00–3:00 PM	9–12	Plaza 1, JW Marriott	Engaging High School Students in Reading and Writing to Support Scientific Practice Proficiency (p. 63)
2:00–3:00 PM	3–12	Platinum Blrm. Salon J, JW Marriott	Productive Academic Talk as a Foundation for Arguing from Evidence (p. 63)
2:00–3:00 PM	6–C	Platinum Blrm. Salon H, JW Marriott	Femineers: A Model for Attracting and Retaining Girls in STEM (p. 63)
2:00–3:00 PM	6–12	Gold Blrm. Salon 2, JW Marriott	Close Reading Practices for the NGSS Notebook (p. 62)
2:00–3:00 PM	K–8	Kentia Hall L, Conv. Center	Reading, Writing, and Science, Oh My! (p. 64)
2:00–3:00 PM	G	506, Conv. Center	NSTA/ASE Honors Lecture: The Climate for Science Practical Work in UK Schools (p. 62)
2:30–3:00 PM	6–C	Plaza 3, JW Marriott	Globalizing Your Curriculum: Promoting Global Citizenship by Bringing the World into Our Classrooms (p. 69)
3:00–6:00 PM	P–K	San Gabriel A, Westin	Kids Love Rocks, So Will You: Introducing Physical Science BIG IDEAS (SC-15) (p. 69)
3:30–4:00 PM	3–7	Kentia Hall R, Conv. Center	Using a Chicken Coop and Raised Gardens to Teach Sustainability (p. 73)
3:30–4:30 PM	K–8	Kentia Hall L, Conv. Center	Creative Co-Teaching (p. 73)
3:30–4:30 PM	C	Olympic 1, JW Marriott	An Innovative Approach to Recruit and Retain Historically Underrepresented Students in Engineering (p. 70)
3:30–4:30 PM	P–12	504, Conv. Center	Maker Faire: Taking a STEAM Fair to the Next Level (p. 72)
3:30–4:30 PM	K–12	Platinum Blrm. Salon I, JW Marriott	Leveraging Green Schools: Using Your School Environment as a Learning Laboratory (p. 71)
3:30–4:30 PM	9–10	Plaza 2, JW Marriott	Bringing PBL from Class to Community (p. 71)
3:30–4:30 PM	G	Platinum Blrm. Salon H, JW Marriott	Making the Science Classroom a Safe Space for LGBT Students (p. 70)
3:30–4:30 PM	6–C	Platinum Blrm. Salon D, JW Marriott	How We Made Our First NGSS Class (p. 70)

3:30–4:30 PM	3–12	Platinum Blrm. Salon J, JW Marriott	Science Olympiad Urban Schools Initiative Kick Starter (p. 71)
3:30–4:30 PM	9–12	Plaza 1, JW Marriott	Do You Know What You Can Do? (p. 71)
3:30–4:30 PM	K–5	Kentia Hall B, Conv. Center	Putting It All Together: The Crossroads of NGSS, CCSS, and ISTE in the Elementary Classroom (p. 72)
3:30–4:30 PM	G	Theatre (411), Conv. Center	Featured Presentation: Engaging ALL in STEM (p. 70)
3:30–4:30 PM	6–8	506, Conv. Center	In My Defense: Writing and Presenting Scientific Research (p. 72)
3:30–4:30 PM	7–C	Kentia Hall P, Conv. Center	Model My Watershed: Using Place-Based Education to Promote STEM Learning and Watershed Citizenship (p. 73)
3:30–4:30 PM	7–12	Diamond Blrm. Salon 6, JW Marriott	Hooks and Investigations in the STEAM Classroom (p. 73)
3:30–4:30 PM	K–12	Diamond Blrm. Salon 2, JW Marriott	Exploring Practices, Nature of Science, and Science in Society: Analyzing Historical Primary Sources from the Library of Congress (p. 73)
3:30–4:30 PM	6–12	Platinum Blrm. Salon F, JW Marriott	Differentiated Instruction That Will Engage Everyone in Your Classroom (p. 74)
3:30–4:30 PM	C	Olympic 3, JW Marriott	Faculty Learning Program: Professional Learning Experience for STEM University Faculty to Improve Teaching Practice (p. 74)
3:30–4:30 PM	5–8	West Hall B-3, Conv. Center	Zombies, Space, and Connecting Creativity to STEM (p. 76)
3:30–4:30 PM	K–5	Kentia Hall D, Conv. Center	STEAMing Through the NGSS (p. 74)
3:30–4:30 PM	4–12	Kentia Hall K, Conv. Center	Using Student-Created Virtual Field Trips to Enhance Learning (p. 75)
3:30–4:30 PM	1–12	Platinum Blrm. Salon A, JW Marriott	AMSE-Sponsored Session: Diversity and Equity: Changing Classroom Assessment Practices to Support Science Achievement (p. 70)
3:30–4:30 PM	P–12	515A, Conv. Center	The Essentials of High-Quality NGSS Implementation for All Students (p. 72)
3:30–4:30 PM	6–C	515B, Conv. Center	Inquiry—Without Reinventing the Wheel (p. 72)
3:30–4:30 PM	G	152, Conv. Center	Award-Winning Share-a-Thon: Featuring NSTA Distinguished Teachers (p. 71)
3:30–4:30 PM	G	514, Conv. Center	Join an NSTA Journal Manuscript Review Panel (p. 72)
4:00–4:30 PM	K–6	502A, Conv. Center	A Response to Intervention Model for Argument-Based Inquiry: The Importance of Using Student Writing to Find Out What They Really Know (p. 76)
4:00–4:30 PM	7–C	Kentia Hall R, Conv. Center	1230 Science: Inclusive, Affordable In-School Research Projects for All (p. 76)
5:00–5:30 PM	P–5	Kentia Hall B, Conv. Center	Interactive Science Read Alouds and Scientific Modeling (p. 77)
5:00–6:00 PM	6–12	515A, Conv. Center	Developing Tools for Three-Dimensional Classroom Assessment (p. 79)
5:00–6:00 PM	K–12	Kentia Hall P, Conv. Center	NASA’s Scale of Discovery: Applications from Our Universe (p. 80)
5:00–6:00 PM	P–4	Kentia Hall E, Conv. Center	Discover Three-Dimensional Learning with the Cat in the Hat Knows A Lot About That: PBS Kids Multimedia Addresses NGSS (p. 80)
5:00–6:00 PM	4–5	Kentia Hall D, Conv. Center	Step-by-Step and Frame-by-Frame: Using NGSS-Based Sentence Frames to Encourage Elementary Students to Talk Science (p. 80)
5:00–6:00 PM	3–8	West Hall B-2, Conv. Center	S.Y.S.T.E.M.S.: STEM-izing Youth Scholars Through Technology Engineering Math and Science (p. 80)
5:00–6:00 PM	6–8	506, Conv. Center	Middle School 3D NGSS in Action! (p. 78)
5:00–6:00 PM	K–12	Platinum Blrm. Salon G, JW Marriott	Two Tools for Observing the NGSS (p. 79)
5:00–6:00 PM	6–12	Diamond Blrm. Salon 8, JW Marriott	Designing a Balanced NGSS Unit Using a 3-Dimensional Planning Organizer (p. 79)
5:00–6:00 PM	1–12	Platinum Blrm. Salon H, JW Marriott	More than Data, Science Is a Story (p. 78)
5:00–6:00 PM	2-5	Kentia Hall G, Conv. Center	“STREAM” Lining the Elementary Experience Science, Technology, Reading, Engineering, Arts, and Math (p. 78)

**General Science Education: Sunday**

8:00–8:30 AM	K–12	513, Conv. Center	Financing Green Schools in Low-Income Communities (p. 83)
8:00–9:00 AM	P–12	303 AB, Conv. Center	Teachers Leading Teachers: Using Protocols to Support Collaboration Around NGSS Implementation (p. 85)

## Schedule at a Glance General Science Education

8:00–9:00 AM	5–8	Kentia Hall J, Conv. Center	The Interactive Science Notebook: The Role of Documentation in Knowledge Construction and the Assessment of Learning (p. 87)
8:00–9:00 AM	9–12	404 AB, Conv. Center	Exploring Visible and Infrared Light and Energy in a 3-Dimensional Learning Setting (p. 87)
8:00–9:00 AM	4–8	Kentia Hall H, Conv. Center	What’s a “CER” and Why Do I Need One? (p. 87)
8:00–9:00 AM	6–8	Kentia Hall M, Conv. Center	Integrating Digital Games into Instruction to Address Crosscutting Concepts (p. 87)
8:00–9:00 AM	K–5	Kentia Hall D, Conv. Center	The Science Practices Hands-On: Exploring the Science Practices from the NGSS (p. 86)
8:00–9:00 AM	P–5	Kentia Hall F, Conv. Center	Ambitious Modeling in the Elementary Classroom (p. 87)
8:00–9:00 AM	K–6	502B, Conv. Center	Coding Curriculum for K–6 Students (p. 84)
8:00–9:00 AM	P–12	512, Conv. Center	HEROES: Helping Educate, Re-energize, and Organize Environmental Stewards (p. 84)
8:00–9:00 AM	P–12	402A, Conv. Center	Leadership Strategies for Ensuring Each Student Has a STEM Future (p. 83)
8:00–9:00 AM	6–12	502A, Conv. Center	Removing Literacy Barriers to Rigorous STEM Units (p. 84)
8:00–9:00 AM	4–10	501C, Conv. Center	Sing for the Planet (p. 84)
8:00–9:00 AM	K–12	408A, Conv. Center	NSTA Press® Session: <i>Problem-Based Learning in the Classroom, K–12</i> (p. 83)
8:00–9:00 AM	7–C	501 AB, Conv. Center	Beyond the CDC Hot Zone (Centers for Disease Control and Prevention) (p. 86)
8:00–9:00 AM	6–12	406 AB, Conv. Center	Epidemiology as the Next “Forensic Science” Capstone Course (p. 86)
9:30–10:00 AM	6–12	515B, Conv. Center	Using 3D Printers in Your Science Classroom (p. 88)
9:30–10:00 AM	7–C	515A, Conv. Center	EQuIP Rubric: A Formative Assessment Tool in Creating NGSS Lessons (p. 88)
9:30–10:30 AM	K–8	506, Conv. Center	Science Teaching Network: How the Peggy Notebaert Nature Museum Uses Teams of Teachers, “Action Research Lite,” and Inquiry-Based Curriculum to Improve Science Instruction in High-Needs Chicago Public Schools (p. 89)
9:30–10:30 AM	G	403A, Conv. Center	Focusing on Physical Science Classes: Creating a Pipeline for Interest in STEM-Related Classes for Females and Underrepresented Minorities (p. 88)
9:30–10:30 AM	9–12	501C, Conv. Center	Which Professional Development Improves AP Scores? (p. 88)
9:30–10:30 AM	6–C	408A, Conv. Center	NSTA Press® Session: Helping Your Students (and You!) Achieve Basic Data Literacy (p. 91)
9:30–10:30 AM	5–8	Kentia Hall N, Conv. Center	Too Much? Too Little? Just Right! (p. 92)
9:30–10:30 AM	3–8/C	Kentia Hall G, Conv. Center	UTeach Boston: Teaching and Learning Together to Support the Three Dimensions in Science (p. 92)
9:30–10:30 AM	4–10	304 AB, Conv. Center	Penguins and Polar Bears: Bring Polar Science to Your Classroom (p. 90)
9:30–10:30 AM	P–6	Kentia Hall E, Conv. Center	Creating a Coding Culture in the Classroom (p. 91)
9:30–10:30 AM	5–10	507, Conv. Center	Communications in STEM (p. 89)
9:30–10:30 AM	K–8	506, Conv. Center	Science Teaching Network: How the Peggy Notebaert Nature Museum Uses Teams of Teachers, “Action Research Lite,” and Inquiry-Based Curriculum to Improve Science Instruction in High-Needs Chicago Public Schools (p. 89)
9:30–10:30 AM	3–9	Kentia Hall H, Conv. Center	How Spatial Reasoning Engages Diverse Learners in Mathematical Understanding and Equips Them for STEM Pursuits (p. 90)
11:00–11:30 AM	6–8	506, Conv. Center	Can Students Learn Argumentation by Playing Video Games with Mentors Online? (p. 93)
11:00 AM–12 Noon	K–2	515B, Conv. Center	Early Elementary STEM Curriculum (p. 95)
11:00 AM–12 Noon	3–10	403A, Conv. Center	Exploring the Chemistry Between Science and ELA (p. 94)
11:00 AM–12 Noon	5–9	507, Conv. Center	Sustainability in the STEM Classroom (p. 94)
11:00 AM–12 Noon	5–12	406 AB, Conv. Center	Just Add Markers: Using Whiteboards to Evaluate Student Thinking (p. 96)
11:00 AM–12 Noon	6–C	514, Conv. Center	To Infinity and Beyond: Send Students Experiments to Space (p. 94)
11:00 AM–12 Noon	3–C	402A, Conv. Center	Raise the Rigor for All and Eliminate the Matthew Effect (p. 93)

11:00 AM–12 Noon	5–8	502B, Conv. Center	Mem Art: Images That Help SPED Students Retain Science Concepts! (p. 94)
11:00 AM–12 Noon	6–C	306 AB, Conv. Center	A Three-Dimensional Look at Your Oldies but Goodies (p. 95)
11:00 AM–12 Noon	K–8	Kentia Hall G, Conv. Center	Applying Three-Dimensional Learning to Everyday Phenomena (p. 96)
11:00 AM–12 Noon	3–6	Kentia Hall B, Conv. Center	Stories to STEM: Connecting Picture Books to Real-Life STEM Projects (p. 95)
11:00 AM–12 Noon	6–12	510, Conv. Center	Mastery Notebooks: Reflective Writing for Internalizing Ideas (p. 94)
11:00 AM–12 Noon	1–8	Kentia Hall J, Conv. Center	Revising Explanatory Models through Peer Feedback (p. 96)
11:00 AM–12 Noon	5–9	Kentia Hall M, Conv. Center	Gaining Perspective: Using Video to Reflect on Teaching Practice Around Integrating <i>CCSS ELA</i> Strategies into Science Instruction (p. 97)
11:30 AM–12 Noon	3–12	501 AB, Conv. Center	Teaching with Screen-Capture Podcasts (p. 97)
11:30 AM–12 Noon	3–6	Kentia Hall C, Conv. Center	You Do Have Time! Infuse Literacy, Digital Citizenship, and Research into Your Science Lessons Without Breaking a Sweat! (p. 97)
11:30 AM–12 Noon	K–5	502A, Conv. Center	Science Notebooks Reloaded (p. 97)

**Informal Science Education: Saturday**

8:00–8:30 AM	K–8	505, Conv. Center	STEM with Sharks: Leveraging the Ocean to Teach <i>Next Generation Science Standards</i> (p. 15)
8:00–9:00 AM	2–8/C	Theatre (411), Conv. Center	Igniting Student Interest and Imagination with Harry Potter Episodes (p. 18)
8:30–9:00 AM	6–12	Kentia Hall N, Conv. Center	Robotics: A Pathway to Get Ready for the Real World (p. 26)
9:30–10:30 AM	5–9	Kentia Hall R, Conv. Center	Going MAD at the Zoo: Bridging Mean Absolute Deviation and Math Standards to Animal Behavior Field Studies (p. 35)
9:30–10:30 AM	2,6–8	Kentia Hall J, Conv. Center	Building Bridges Between Elementary and Middle School Science Through STEM (p. 34)
9:30–10:30 AM	4–5	Kentia Hall C, Conv. Center	Teaching and Learning—Outdoors and Active! (p. 34)
9:30–10:30 AM	10–C	West Hall B-5, Conv. Center	Real-World Three-Dimensional Environmental Science (p. 31)
9:30–10:30 AM	6–12	Kentia Hall P, Conv. Center	Science from the Ends of Earth: Nat Geo Fellows Bring Field Experiences into the Classroom (p. 31)
9:30–10:30 AM	1-C	Diamond Blrm. Salon 6, JW Marriott	How Can a STEM Teacher Become a Relevant and Sought-After Voice in Policy? (p. 29)
11:00 AM–12 Noon	5–9	504, Conv. Center	Packing Your Scale Backpack: Research-Based Science Resources and Experiences for Learning about Size and Scale (p. 43)
11:00–12:30 PM	7–C	152, Conv. Center	High School Hands-On Hodge-Podge Share-a-Thon (p. 50)
12:30–1:30 PM	G	515B, Conv. Center	Engaging Multilingual Students and Their Families in STEM (p. 55)
12:30–2:30 PM	G	151, Conv. Center	Science in the Community Session: Using Informal Science Experiences to Explore Environmental Issues (p. 60)
2:00–2:30 PM	4–8	Kentia Hall J, Conv. Center	Helping Girls See Themselves as Capable Engineers (p. 61)
2:00–3:00 PM	1–12	Platinum Blrm. Salon C, JW Marriott	STEAM Festivals: Improving Your Science Fair (p. 63)
2:00–3:00 PM	3–12	Platinum Blrm. Salon B, JW Marriott	Facilitating NGSS Practices Through Citizen Science (p. 66)
3:30–4:00 PM	K–8	Kentia Hall J, Conv. Center	IMAGINE HKIS: Family STEM Event (p. 69)
3:30–4:30 PM	P–4	West Hall B-2, Conv. Center	Partnering with Parents to Level the Playing Field in Science (p. 76)
3:30–4:30 PM	P–12	504, Conv. Center	Maker Faire: Taking a STEAM Fair to the Next Level (p. 72)
3:30–4:30 PM	4–C	Petree Hall D, Conv. Center	NESTA and PRI Share: <i>Teacher-Friendly Guides™</i> to the Earth Science of the United States: Regional Content Guides for Place-Based Approaches to Earth System Science Education (p. 73)
3:30–4:30 PM	K–12	Platinum Blrm. Salon I, JW Marriott	Leveraging Green Schools: Using Your School Environment as a Learning Laboratory (p. 71)
3:30–4:30 PM	9–10	Plaza 2, JW Marriott	Bringing PBL from Class to Community (p. 71)
4:00–4:30 PM	4–8	Kentia Hall J, Conv. Center	A Is for Theater and STEM (p. 76)
4:00–4:30 PM	7–C	Kentia Hall R, Conv. Center	1230 Science: Inclusive, Affordable In-School Research Projects for All (p. 76)
5:00–6:00 PM	G	502B, Conv. Center	4-H Follow a Researcher™ (p. 78)

### Informal Science Education: Sunday

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8:00–9:00 AM	P–12	512, Conv. Center	HEROES: Helping Educate, Re-energize, and Organize Environmental Stewards (p. 84)
8:00–9:00 AM	4–10	501C, Conv. Center	Sing for the Planet (p. 84)
9:30–10:30 AM	7–12	511C, Conv. Center	Citizen Science Ecosystem Biodiversity in the U.S. and Abroad (with Lemurs!) (p. 89)
11:00 AM–12 Noon	7–12	408B, Conv. Center	Using a STEM Club to Promote STEM Schoolwide (p. 94)
11:00 AM–12 Noon	6–C	514, Conv. Center	To Infinity and Beyond: Send Students Experiments to Space (p. 94)
11:00 AM–12 Noon	5–12	511C, Conv. Center	Space Station Explorers (p.
11:00 AM–12 Noon	10–C	301 AB, Conv. Center	Building, Evaluating, and Using Systems Models (p. 95)m,

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