Destination: Success® is a unique educational platform that assists students with discovering their “perfect fit” career in the sciences or health professions. USciences is uniquely positioned with the academic programs, faculty, and resources to support students as they follow their path.

Extensive, intensive, and customized, Destination: Success® enhances the USciences journey through:

• **Expanded advising:** Students are guided by multiple advisors who help them discover their options and available resources to confirm that they are on the right path.

• **Flexible curricula:** Transition is smooth, as students take the opportunity to discover majors and programs that fit their goals and strengths with the ability to typically graduate on schedule.

• **Hands-on experiential learning:** Students can begin research as early as the first year and participate in internships and professional shadowing opportunities to reinforce and strengthen their experience.

• **“Early Assurance” seats:** Through USciences’ articulation relationships, students have access to reserved seats in health profession programs at USciences and 8 other partner institutions, leading to degrees in medicine, dentistry, veterinary medicine, optometry, physical therapy, occupational therapy, and more.

To learn more, visit usciences.edu/DestinationSuccess/NSTA
Starts With Inspiring You

It’s an exciting time in education—technology has the potential to help improve outcomes and inspire student success. Our programs are purposefully designed to meet your digital, print, or blended instructional needs so you can provide customized learning experiences for every student. Get inspired by:

• Live demos of our NEW programs.
• Presenters including Dinah Zike, science experts and thought leaders.
• Workshops on NGSS*, literacy integration, gamification, and more.
• Exciting giveaways

Learn more at mheonline.com/nsta2016

*Next Generation Science Standards is a registered trademark of Achieve. Neither Achieve nor the lead states and partners that developed the Next Generation Science Standards was involved in the production of, and does not endorse, this product.
SAVE THE DATES 2016

MINNEAPOLIS MINNESOTA
OCTOBER 27–29
CELEBRATE SCIENCE: 10,000 CONNECTIONS

PORTLAND OREGON
NOVEMBER 10–12
EXPLORING MOUNTAINS: GUIDING SCIENCE TEACHING AND LEARNING

COLUMBUS OHIO
DECEMBER 1–3
CHAMPIONS OF SCIENCE: A GAME PLAN FOR THE FUTURE!

PROFESSIONAL DEVELOPMENT STRANDS

Teaching Science in a Connected World
STEMify Instruction Through Collaboration Across the Curriculum
Celebrating Elementary Science and Literacy Connections

Base Camp: Collaborating to Integrate Elementary Science Instruction with Math and ELA
The View from the Summit: Celebrating Science for All
The View from All Angles: Connecting Three-Dimensional Science Instruction

Training Camp: Strengthening Fundamentals in Elementary Education
Game Time: Tackling Scientific Problems and Pitching Engineering Solutions
Science Boosters: Taking It to the Next Level

For more information and to register, visit www.nsta.org/conferences
The environment is important to science educators. These programs are recyclable and were printed on recycled paper.
National Earth Science Teachers Association
Events at 2016 Nashville NSTA Conference

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

**Friday, April 1**

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

**Saturday, April 2**

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

NESTA gratefully acknowledges the following organizations as sponsors:
### Conference Program • Highlights

**Saturday, April 2**

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

---

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

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

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

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

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

Stringing It All Together: Three-Dimensional Learning
The NRC Framework and the Next Generation Science Standards identified best practices from research for today’s learners. Good instruction must incorporate the NGSS three dimensions of crosscutting concepts, disciplinary core ideas, and science and engineering practices. Three-dimensional science learning produces scientifically literate and competent students. This strand will exemplify the intertwining nature of the three dimensions necessary for the highest quality science instruction. This strand will be tied together by accessing the latest research findings regarding science education.
Saturday, April 2
8:00–8:30 AM
Connecting Interactive Science Notebooks and NGSS Practices: Early Childhood Students Engaging Their Community

8:30–9:00 AM
Little Learners, BIG Ideas: Innovative Thinking in Early Childhood

9:30–10:30 AM
Using the 2017 U.S. Total Solar Eclipse to Promote Educational Outreach

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

Sunday, April 3
8:30–9:00 AM
Using Expeditions as Contexts for Teaching Science: Adventure Mississippi River

9:30–10:00 AM
Science Fair: A Learning Progression Across K–5

10:00–10:30 AM
Using Web-Based Resources to Assist Diverse Learners to Learn Scientific Concepts While Engaging in Science Practices

Setting the Stage: Scientific Literacy

11:00 AM–12 Noon
Your Kids Can, Too! Scientific Argumentation for All Students

12:30–1:30 PM
Write to Know Science

2:00–3:00 PM
Designing Animals to Survive Cold Temperatures

3:30–4:30 PM
From Cookbook to Open Inquiry: How to Develop the Necessary Skills

5:00–5:30 PM
Enhanced Exit Ticket: Round-Trip to Greater Student-Teacher Accountability

5:30–6:00 PM
Primary Literature: Students Reading Real Science

FORENSIC SCIENCE:
FOODBORNE OUTBREAK INVESTIGATION
BAD FOOD AT A GOOD PARTY

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

Come to Booth 816 for more info
Conference Program • Conference Strands

Building the Band: Involving Community Stakeholders

Saturday, April 2
8:00–9:00 AM
Students and Teachers Investigating Climate Change and Remote Sensing

8:40 AM–3:30 PM
Short Course: Is It Spring Yet? Field Studies with Middle School Citizen Scientists
(By Ticket: SC-14)

9:30–10:30 AM
Science Ambassadors: Partnering Elementary and High Schools for STEM Night Events

11:00 AM–12 Noon
Making STEAM Rise in Your School

12:30–1:00 PM
Empowering Our Students to Be Citizen Scientists!

1:00–1:30 PM
Using Career Academies to Develop Community Partnerships in the Classroom

Sunday, April 3
9:30–10:00 AM
Planting the Seeds to Cultivate Meaningful Science Practices in Garden Classrooms

10:00–10:30 AM
Building a Learning Garden While Integrating Literacy and Science

Stringing It All Together: Three-Dimensional Learning

Saturday, April 2
8:00–9:00 AM
All Learners and the NGSS: The Importance of Three-Dimensional Learning and Reasoning

8:00–11:00 AM
Short Course: Building Better Lessons: NGSS Classroom Redesign (By Ticket: SC-11)

9:30–10:30 AM
Engineering Remotely Operated Vehicles Incorporates Three-Dimensional Learning to Improve Student Achievement

11:00 AM–12 Noon
Revamping Our Best Earthquake Lessons with Argument-Driven Inquiry to Better Target the NGSS

12:30–1:00 PM
Warm the Water to Save Your City: An Engineering and Educational Technology NGSS Student Assessment Task

Harmonizing Concepts: Integrating Instruction

Saturday, April 2
8:00–9:00 AM
Art and the Cosmic Connection

9:30–10:30 AM
NGSS and CCSS Mashup: Science Museum Transforms Teaching

11:00 AM–12 Noon
Come Fly with Us!

12:30–1:30 PM
Lead with Science: Learn How to Use Science Tasks to Reinforce Common Core State Standards, in English Language Arts and Mathematics

5:00–6:00 PM
A Cross-Curricular Contamination Case: Integrating Core Content Through Self-Paced Learning

Sunday, April 3
8:00–9:00 AM
Chapter Books at the Crossroads of the NGSS and CCSS

9:30–10:30 AM
Project-Based Learning: How It Has Changed Teaching and Learning in Our School

11:00 AM–12 Noon
Data Literacy for Science Teachers: Understanding and Integrating CCSS Mathematics Data Standards to Strengthen Your Science Curriculum

1:00–1:30 PM
Explaining Population Dynamics Through the Modeling of Long-Term Data on Hurricane Disturbance in Puerto Rico

3:30–4:30 PM
Motivating Modeling with Anchoring Phenomena and Challenge Questions

Sunday, April 3
8:00–9:00 AM
Is Your Beak Stuck? How to Use the Three Dimensions of the NGSS in a Natural Selection Activity

9:30–10:30 AM
From Memorization to Modeling—Reconceptualizing Teaching About Cellular Division

11:00 AM–12 Noon
Orchestrating a Scientific Symphony with the Three Dimensions of the NGSS
Teacher Researcher Day

Saturday, April 2, 8:30 AM–4:30 PM
East Ballroom, Renaissance

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

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

Stop by our booth #926

For your chance to WIN a FREE MANIKEN® Lab Station!

Workshops Available

ANATOMY IN CLAY® LEARNING SYSTEM

970.667.9047
info@anatomyinclay.com
anatomyinclay.com
NSTA Press Sessions

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

Saturday, April 2
8:00–9:00 AM
Integrating Engineering Practices into a Whole-Class Inquiry Challenge


9:30–10:30 AM
Solar Astronomy Curriculum Resource that Meets the NGSS = Getting Ready for the All-American Eclipse

11:00 AM–12 Noon
Diving into the NGSS Disciplinary Core Ideas: How and Why They Are Important for Teaching and Learning

Bringing Outdoor Science In

Learn Strategies to Help You Implement the NGSS Practices!

2:00–3:00 PM
Five E(2), “Elementary” Steps To Next Generation Science Teaching

3:30–4:30 PM
Uncovering Student STEM-Connected Ideas in Science

Sunday, April 3
8:00–9:00 AM
CCSS ELA and Literacy + NGSS = Even More Brain-Powered Science

9:30–10:30 AM
What Are They Thinking? Investigating the Moon Through Formative Assessment Probes and Strategies That Link Concepts and Practices

11:00 AM–12 Noon
Forensics in Chemistry

The NGSS@NSTA Hub

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

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

NGSS Share-a-Thon

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

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

Saturday, April 2, 10:00 AM–4:00 PM
Omni

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

Calling all middle school science teachers! Meet Me in the Middle Day is designed just for you. The day will include sessions geared toward middle school, and a share-a-thon with a room full of activities that you can take back to your classroom. Join us and re-energize your teaching. You may even be the lucky winner of an iPad mini or other door prizes. Meet Me in the Middle sessions are described throughout this volume.

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:15–10:45 AM</td>
<td>Concurrent Sessions</td>
</tr>
<tr>
<td>11:00–11:30 AM</td>
<td>Concurrent Sessions</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>Concurrent Sessions</td>
</tr>
<tr>
<td>1:15–1:45 PM</td>
<td>Concurrent Sessions</td>
</tr>
<tr>
<td>2:00–4:00 PM</td>
<td>Middle Level Share-a-Thon</td>
</tr>
</tbody>
</table>

To submit a proposal, visit www.nsta.org/conferenceproposals

NSTA 2017 National Conference on Science Education

Los Angeles, CA • March 30 – April 2

SHARE YOUR IDEAS!

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

Proposal Deadline: 4/15/2016
### Three Dimensions of the Next Generation Science Standards (NGSS)

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

### Disciplinary Core Ideas

#### Disciplinary Core Ideas in Physical Science
- **PS1: Matter and Its Interactions**
  - PS1.B: Chemical Reactions
  - PS1.C: Nuclear Processes
- **PS2: Motion and Stability: Forces and Interactions**
  - PS2.A: Forces and Motion
  - PS2.B: Types of Interactions
  - PS2.C: Stability and Instability in Physical Systems
- **PS3: Energy**
  - PS3.A: Definitions of Energy
  - PS3.B: Conservation of Energy and Energy Transfer
  - PS3.C: Relationship Between Energy and Forces
  - PS3.D: Energy in Chemical Processes and Everyday Life
- **PS4: Waves and Their Applications in Technologies for Information Transfer**
  - PS4.A: Wave Properties
  - PS4.B: Electromagnetic Radiation
  - PS4.C: Information Technologies and Instrumentation

#### Disciplinary Core Ideas in Life Science
- **LS1: From Molecules to Organisms: Structures and Processes**
  - LS1.A: Structure and Function
  - LS1.B: Growth and Development of Organisms
  - LS1.D: Information Processing
- **LS2: Ecosystems: Interactions, Energy, and Dynamics**
  - LS2.A: Interdependent Relationships in Ecosystems
  - LS2.B: Cycles of Matter and Energy Transfer in Ecosystems
  - LS2.C: Ecosystem Dynamics, Functioning, and Resilience
  - LS2.D: Social Interactions and Group Behavior
- **LS3: Heredity: Inheritance and Variation of Traits**
  - LS3.A: Inheritance of Traits
  - LS3.B: Variation of Traits
- **LS4: Biological Evolution: Unity and Diversity**
  - LS4.B: Natural Selection
  - LS4.C: Adaptation
  - LS4.D: Biodiversity and Humans

#### Disciplinary Core Ideas in Earth and Space Science
- **ESS1: Earth's Place in the Universe**
  - ESS1.A: The Universe and Its Stars
  - ESS1.B: Earth and the Solar System
  - ESS1.C: The History of Planet Earth
- **ESS2: Earth's Systems**
  - ESS2.A: Earth Materials and Systems
  - ESS2.B: Plate Tectonics and Large-Scale System Interactions
  - ESS2.C: The Roles of Water in Earth’s Surface Processes
  - ESS2.D: Weather and Climate
  - ESS2.E: Biogeology
- **ESS3: Earth and Human Activity**
  - ESS3.A: Natural Resources
  - ESS3.B: Natural Hazards
  - ESS3.C: Human Impacts on Earth Systems
  - ESS3.D: Global Climate Change

#### Disciplinary Core Ideas in Engineering, Technology, and the Application of Science
- **ETS1: Engineering Design**
  - ETS1.A: Defining and Delimiting an Engineering Problem
  - ETS1.B: Developing Possible Solutions
  - ETS1.C: Optimizing the Design Solution
- **ETS2: Links Among Engineering, Technology, Science, and Society**
  - ETS2.A: Interdependence of Science, Engineering, and Technology
  - ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World

12  
NSTA Nashville National Conference on Science Education
SCIENCE RESOURCES FOR YOUNG CHILDREN

Young children need STEM, too! That’s why the National Association for the Education of Young Children provides its members with some of the most groundbreaking resources on introducing children from birth to age 8 to science, technology, and other crucial areas of learning.

**Books and Publications:** Find these books and more at NAEYC.ORG/STORE!

**NEW! Engaging Young Engineers: Teaching Problem-Solving Skills Through STEM**
- Item #7237
- Price: $37

**Starting With Science: Strategies for Introducing Young Children to Inquiry**
- Item #115
- Price: $19

**Spotlight on Young Children: Exploring Science**
- Item #373
- Price: $20

Visit NAEYC.ORG/MEMBERSHIP and join today!

**BONUS:** NSTA Conference attendees receive an extra 10 percent discount at NAEYC.ORG/STORE with code NSTA2016 through April 30, 2016!
Built to honor Tennessee’s 200th birthday and considered one of Nashville’s top attractions, the Bicentennial Capitol Mall State Park is an outdoor museum of the state’s history, which includes an 18,000 lb. rotating granite globe showing the places where Tennesseans fought during World War II.
7:00–9:00 AM  Networking Opportunity
APAST Breakfast Meeting
(By Invitation Only)  Broadway K, Omni
Start your day with a great breakfast and catch up with old friends. This is an excellent opportunity to find out what’s happening. Get more involved with APAST! For additional information, please visit www.apast.org.

7:30–8:15 AM  Networking Opportunity
NSTA Past Presidents’ Breakfast
(By Invitation Only)  Legends A, Omni

8:00–8:30 AM  Presentations
Connecting Interactive Science Notebooks and NGSS Practices: Early Childhood Students Engaging Their Community
(Grades P–6)  101E, Music City Center
Science Focus: PS, SEP
Kyle Phelps (phelps.39@wright.edu), Enon Primary School, Dayton, Ohio
Michelle Fleming (michelle.fleming@wright.edu) and Samantha Baker, Wright State University, Dayton, Ohio
Join us as we showcase urban early childhood students’ interactive science notebooks using the NGSS practices to engage their community in a schoolwide science fair.

The Vanderbilt Scientist-Teacher Collaborative Apprenticeship: Enhancing Science Teaching and Learning in Middle Schools
(Grades 5–8)  Davidson A2/3, Music City Center
Science Focus: GEN
Heather J. Johnson (heather.j.johnson@vanderbilt.edu), Vanderbilt University’s Peabody College, Nashville, Tenn.
Emphasis will be placed on the unique Vanderbilt scientist—teacher collaborative apprenticeship that leads to positive impacts on teacher, student, and fellow participants.

Making Informal Partnerships More Formal
(Grades K–12)  Acoustic, Omni
Science Focus: INF, NGSS
Thomas McKenna (@tjscience; tjmckenna01@gmail.com), Connecticut Science Center, Hartford
Successful implementation of the NGSS requires major support—informal science institutions can be that support in more ways than one.

---

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

The science areas and their abbreviations are:

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

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

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

Setting the Stage: Scientific Literacy

Building the Band: Involving Community Stakeholders

Harmonizing Concepts: Integrating Instruction

3D  Stringing It All Together: Three-Dimensional Learning

The following icons will be used throughout this program.

NSTA Press® Sessions

INF Sessions highlighting STEM learning experiences that occur in out-of-school environments.
Dalton, Curie, Bohr, and More: A Chemistry Unit Outline
(Grades 6–12) Broadway A, Omni
Science Focus: PS1
Marla Hines (marlarhines@gmail.com) and Jennifer Brown (@jbrownaps; brownjc@vestavia.k12.al.us), Vestavia Hills High School, Vestavia Hills, Ala.
Amy Murphy (@amykfmurphy; amykfmurphy@gmail.com), University of Montevallo, Ala.
We will share a chemistry unit organized by the major discoveries in the field of chemistry to help students see the big picture and make connections.

STEM Partnerships Among All Levels: Bringing It All Together
(General) Broadway B, Omni
Science Focus: GEN, NGSS
Bonnie Maur (bmaur1@aol.com), Sacred Heart University, Fairfield, Conn.
Discussion centers on the implications of collaborating to create PD opportunities and provide examples of curriculum development in the STEM arena incorporating practices based on the NRC Framework and CCSS. Multi-leveled educators collaborated to create interdisciplinary STEM units.

Differentiated Instruction Through Technology-Based Menus
(Grades 3–12) Broadway G, Omni
Science Focus: GEN
Michele Thompson (@mkttexas; mthompson2@kleinsd.net), Klein Instructional Center, Spring, Tex.
Let’s show you the power of choice for students through menus with hands-on and technology options.

A Consilient Approach to Interdisciplinary History and Science
(Grades 7–12) Broadway J, Omni
Science Focus: LS4, CCC
Nathan Mook (@nathanmook; nmook@chandlerschool.org), Chandler School, Pasadena, Calif.
Open the door to new ways of understanding human history through genetics. Our project aims to create a more holistic, nuanced approach to studying past civilizations by utilizing new arenas of scientific investigation, such as genetics, forensics, heredity, and pedigrees.

Noticing Phenomena or Everyone Knows What a Zebra Looks Like
(Grades 4–10) Cumberland 2, Omni
Science Focus: GEN, CCC1, CCC6, SEP1, SEP2, SEP3, SEP4
Richard Frazier (richard_frazier@hotmail.com), American Embassy School–New Delhi, India
We scrutinize the zebra test, consider showing patterns to students vs. helping them discover on their own, and explore activities about noticing and scientific inference.
# Saturday, April 2

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

NSTA Press® Session: Integrating Engineering Practices into a Whole-Class Inquiry Challenge
(Grades 9–12) 101D, Music City Center
Science Focus: ETS
Dennis Smithenry (smithenryd@elmhurst.edu), Elmhurst College, Elmhurst, Ill.
Michael Nocella (micnoc@d219.org), Niles West High School, Skokie, Ill.
Learn how an early-career chemistry teacher has integrated engineering practices into a “whole-class inquiry” challenge and hear what the experts have to say about it.

Students and Teachers Investigating Climate Change and Remote Sensing
(Grades 6–College) 103B, Music City Center
Science Focus: ESS, SEP4
David Bydlowski (@k12science; davidbydlowski@me.com), Science Consultant, Livonia, Mich.
Paul Henry (@k12science; henrya@resa.net), Wayne County Regional Educational Service Agency, Wayne, Mich.
Student projects require teachers to provide the best instructional materials while students collect “real” data. This happens when students investigate climate change and remote sensing.

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

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

Before and After Retirement—Practicalities and Possibilities
Saturday, April 2
9:30–10:30 AM
Omni Nashville Hotel, Music Row 3

For more information on the Retired Members Advisory Board, contact Linda Smith, chair, at elementary.science.teacher@gmail.com.
The NGSS@NSTA Hub (Grades K–12) 104A, Music City Center Science Focus: GEN, CCC1, CCC2
Ted Willard (@Ted_NSTA; twillard@nsta.org), Program Director, NGSS@NSTA, NSTA, Arlington, Va.
This session will feature a tour of the NGSS@NSTA Hub, a digital destination to support teaching and learning of the NGSS. Hear about the work of 55 NGSS@NSTA curators—a group of educators from all across the U.S. working to identify resources that support the standards.

Help! I Don’t Know How to Grow Plants in My Classroom (Grades P–8) 106A, Music City Center Science Focus: LS, CCC1, CCC2, CCC6, SEP1, SEP3
Gennadyi Gurman (ggurman@queensbotanical.org), Urban Advantage at Queens Botanical Garden, Flushing, N.Y.
We’ll dig into how to bridge the gap between the desire and the ability to grow plants in the classroom as well as address related pedagogical methodology.

Design Engineering with Young Learners Using Edible Lunar Vehicles (Grades 2–8/College) Broadway H, Omni Science Focus: ETS1, CCC
Kate Baird (@7350goldendreams; kabaird@iupuc.edu), Indiana University–Purdue University Columbus
Stephanie Coy (sscoy@iupuc.edu), Ingleswood Elementary School, Nashville, Tenn.
Today, partnerships are often multinational. See how we build engineering design and crosscutting concepts into an edible lunar vehicle with worldwide school partners.

Teacher’s Guide to Technical Writing for STEM: Proposals, Plans, and Reports (Grades 6–12) Cumberland 1, Omni Science Focus: GEN, NGSS
Angela McMurry (@AngelaMcMurry1; angela_mcmurry@darke.k12.oh.us) and April Wulber (@awulber; april_wulber@darke.k12.oh.us), Darke County ESC, Greenville, Ohio
Receive a copy of the guide developed for teachers by teachers that provides resources to assist in preparing students for the technical writing required for any type of STEM proposal or project.

INF After-School STEM Partnerships in Nashville (Grades 1–12) Cumberland 3, Omni Science Focus: INF
Melissa Ballard (@afterschool4all; @mellyball; mjballard@afterschoolalliance.org), Afterschool Alliance, Washington, D.C.
Tiffany Hodge (thodge@pencilfd.org), PENCIL Foundation, Nashville, Tenn.
Katherine Jezidja-Kendall (@katiekendall199; katiekendall15@gmail.com), John Early Museum Magnet Middle School, Nashville, Tenn.
Robyn Sellers (rsellers@adv Scotecistory.org), Adventure Science Center, Nashville, Tenn.
Nashville boasts a unique partnership network for after-school learning. Find out how to think BIG when developing STEM learning experiences outside of the school day.

Dragon Genetics and Other Powerful Free Simulations for Biology Teaching (Grades 6–College) Cumberland 4, Omni Science Focus: LS1, LS3, CCC, SEP
Chad Dorsey (@chaddorsey; c dorsey@concord.org) and Frieda Reichsman (@freichsman; freichsman@concord.org), The Concord Consortium, Concord, Mass.
Add some fire to your genetics teaching with Geniverse, a game-based unit on dragons, genetics, and DNA. This research-based genetics curriculum from The Concord Consortium has been demonstrated to deepen students’ learning and engage them with all three dimensions of the NGSS. Receive free login and class account for Geniverse.

Using Young Adult Literature to Support Content Learning and Reading Comprehension in the Science Classroom (Grades 4–12) Cumberland 5, Omni Science Focus: GEN, NGSS
Paula Greathouse and Stephanie Wendt, Tennessee Tech University, Cookeville
Transform your science classroom through the introduction of young adult literature—addressing national science standards and CCSS ELA in tandem.
Learning About Earth Across the Curriculum: Mapping Connections Between NGSS and Social Studies Across K–12
(Grades K–12) Electric, Omni
Science Focus: ESS
Ann Rivet (@arivet6; rivet@tc.columbia.edu), Teachers College, Columbia University, New York, N.Y.
I’ll present key opportunities and strategies identified from the NGSS for developing shared understanding of Earth and environment concepts between Earth science and geography.

Formative Assessments and the NGSS
(Grades 5–9) Mockingbird 2, Omni
Science Focus: GEN, NGSS
Melissa Davis (melissa.davis@jefferson.kyschools.us), Mallory Jensen (mallory.jensen@jefferson.kyschools.us), and Jacob Read (jacob.read@jefferson.kyschools.us), Frederick Law Olmsted Academy South, Louisville, Ky.
Lacey Eckels (lacey.eckels@jefferson.kyschools.us), Jefferson County Public Schools, Louisville, Ky.
Are you struggling with NGSS implementation and formative assessment? Come see how our school transitioned to the NGSS using a schoolwide formative assessment system as our vehicle.

CCSS + NGSS = Science Fair
(Grades 4–12) Mockingbird 4, Omni
Science Focus: GEN, SEP
Ronda Fields (rkfields@twc.com), Ballard High School, Louisville, Ky.
Ashley Fields, J.B. Atkinson Academy for Excellence in Teaching and Learning, Louisville, Ky.
Science Fair projects cover multiple disciplines. The project itself is the science, but English, social studies, math, and other disciplines also come into play. Receive an overview of the process from two teachers—one who has coached more than 20 Intel International Science and Engineering Fair® (ISEF) finalists and one who was a three-time ISEF finalist.

Student-Driven Research Projects in a High School Science Classroom
(Grades 9–12) Music Row 1, Omni
Science Focus: GEN, NGSS
Sean Kerwin (@SeanKerwin1; skerwin@wacohi.net) and Jennifer Miller (@jennamiller4; jmiller@wacohi.net), Washington Community High School, Washington, Ill.
We will cover designing and implementing student-driven research in a high school classroom, including potential hurdles and the ability to link projects to the NGSS.

AMSE Session: Opportunities to Improve Equity in Your Classroom
(Grades 4–College) Music Row 2, Omni
Science Focus: GEN, SEP
Deb Morrison (@educatordeb; educator.deb@gmail.com), TREE Educational Services, Boulder, Colo.
This session can help you gain confidence to improve the way you interact with students and it can open opportunities for all students to participate and succeed in the classroom.

INF ASTC Session: Beyond the Classroom Walls—Tapping into Informal Science Centers to Support Student-Driven Investigations
(Grades K–12) Music Row 3, Omni
Science Focus: INF, SEP1, SEP3, SEP4
Eric Godoy (@marmito79; egodoy@dmns.org), Denver Museum of Nature & Science, Denver, Colo.
Patricia Kincaid (kincaidpatty@msn.com), Denver (Colo.) Public Schools
Acquire resources to support meaningful, authentic student investigations and hear research results from Urban Advantage Metro Denver’s partnership between school districts and informal science organizations.

Deconstructing the Silos of Physical and Life Sciences in Grades 7–12 Classrooms
(Grades 5–College) Fisk Two, Renaissance
Science Focus: LS, PS, CCC, SEP
Lisa Neesemann (@PeskyPlatypus; lisa.neesemann@gmail.com), Jessica Riccio (riccio@tc.edu), and Peter Hillman (pch2110@tc.columbia.edu), Teachers College, Columbia University, New York, N.Y.
We will illustrate disciplinary core ideas and model the use of NGSS sample tasks. Our unique approach melds life and physical sciences into a cohesive crosscutting curriculum per the NGSS.

CEEMS: Challenge-Based Learning Units Incorporating Engineering Design with Secondary Science and Math Content
(Grades 7–12) Music City Ballroom, Renaissance
Science Focus: ETS1, SEP
David Vernot (dvernot@gmail.com), University of Cincinnati School of Engineering, Cincinatti, Ohio
Secondary teachers developed CBL engineering units through this NSF-funded program. See examples and get access to a searchable database of 100+ of these units.
Saturday, 8:00–9:00 AM

Project-Based Learning: Curriculum Design and Integration Strategies That Address NGSS and CCSS (Grades 4–12) West Ballroom, Renaissance Science Focus: GEN, SEP Alfred Hall II (alhall1@memphis.edu), The University of Memphis, Tenn. Review components of PBL design and engage in the development of a PBL unit with integrated content and objectives to address the NGSS and CCSS.

8:00–9:00 AM Hands-On Workshops

STEMulate Student Learning by Infusing Engineering Design Using the 6 Es (Grades 4–8) 101 A/B, Music City Center Science Focus: ETS1, PS2 Anita Deck (anita.deck@gmail.com), Virginia Tech, Blacksburg This 6E adds E-search to the 5E (Engage, Explore, Explain, Elaborate, and Evaluate) model. Join me for a hands-on, cross-curricular engineering design challenge activity with the 6E instructional model that inspires thinking, collaboration, creativity, and problem solving.

NSTA Press® Session: Picture-Perfect Science Lessons: Using Picture Books to Guide Inquiry, K–5 (Grades K–5) 101C, Music City Center Science Focus: GEN, CCC1, CCC2 Emily Morgan (@EmilyMorganNTYS; emily@pictureperfectscience.com) and Karen Ansberry (karen@pictureperfectscience.com), Picture-Perfect Science, West Chester, Ohio The authors of NSTA’s award-winning Picture-Perfect Science series will share lessons that integrate elementary science and the Common Core State Standards for ELA.

All Learners and the NGSS: The Importance of Three-Dimensional Learning and Reasoning (Grades 3–7) 103A, Music City Center Science Focus: LS David Crowther, (crowther@unr.edu), University of Nevada, Reno Explore three-dimensional learning with explicit language considerations and adaptations for ELL through a life science learning experience geared for grades 3–7. Participants will learn to modify existing lessons to accommodate three-dimensional learning aspects and language considerations for all learners.

Evaluate Your Sessions Online!

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

Art and the Cosmic Connection (Grades 4–10) 103C, Music City Center Science Focus: ESS, CCC1, SEP1, SEP4, SEP6 Whitney Cobb (@STEM_McREL; wcobb@mcrel.org), McREL International, Denver, Colo. Shari Asplund (shari.e.asplund@jpl.nasa.gov), NASA Jet Propulsion Laboratory, Pasadena, Calif. Spectacular images arrive from NASA missions. What stories do they tell? The elements of art—shape, line, color, texture, and value—galvanize analysis and discourse. STEAM!

To the Moon and Back (Grades 4–6) 104C, Music City Center Science Focus: ESS1.B, ESS1.C, ESS2.A Amanda Blough (@teacher4b; ablough@ccschambersburg.org) and Amy Fetterhoff (@FetterhoffAmy; teacher5a@corpus.pa.net), Corpus Christi School, Chambersburg, Pa. Come learn how to apply NASA resources to your Earth and space science curriculum. Lessons include how moon rocks can be used to teach Earth’s geology by observing and recording data gathered from authentic moon rocks on loan from NASA Johnson Space Center. We’ll compare the geology of the moon to Earth’s geology and you’ll learn firsthand about the location of those moon rocks through hands-on activities. This session will also provide tech resources that students can use on any mobile device or personal computer. A comprehensive list of resources for all attendees. Allergy Warning: Candy that contains peanuts will be used.

Looking Up: Make Satellite Observations by Matching What a Satellite Sees! (Grades K–8) 104E, Music City Center Science Focus: ESS2.D, CCC1, SEP1, SEP3, SEP4, SEP8 Tina Harte, NASA Langley Research Center, Hampton, Va. Engage students in making cloud and weather observations for NASA. Through the use of classroom activities and games, your students will gain a better understanding of clouds and have fun at the same time!
Fantastic Physical Science for Young Learners!
(Grades P–1) 105A, Music City Center
Science Focus: PS2.A, SEP
Pamela Nolan-Beasley, Waitsburg (Wash.) School District
Explore fast-paced inquiry that’s sure to inspire our youngest scientists. Lively force and motion activities are NGSS focused and can be integrated with reading, writing, and language lessons.

Beyond the Fair: Carnivals, Olympiads, and STEAM Clubs, Oh My!
(Grades K–8) 105B, Music City Center
Science Focus: INF, SEP
Betsy Penn (pennb@leonschools.net), Deerlake Middle School, Tallahassee, Fla.
Lindsey Wohlrab (wohlrabl@leonschools.net), Roberts Elementary School, Tallahassee, Fla.
Check out how schools are integrating science carnivals, STEM clubs, and science olympiads into the curriculum in lieu of the classic science fair.

Space System for Middle School: How to Use an Orrery to Teach Earth-Sun-Moon Interactions
(Grades 6–8) 106C, Music City Center
Science Focus: ESS1.B, CCC4, SEP2
Walter Glogowski (@wglogowski; wglogowski@gmail.com), 123STEM.com, Winnetka, Ill.
Learn how to construct an orrery as well as develop a narrative for your students so they can make deep connections to the Earth-Sun-Moon system interactions, including which cyclic patterns are responsible for lunar phases, eclipses, and the seasons. The first 50 participants will get a free orrery kit along with curriculum packet.

Math, Science, and ELA Team Up for an Oil Spill
(Grades 5–8) Broadway C, Omni
Science Focus: ESS3.C, SEP
Kimberly O’Dell (odellk@clintonschools.org) and Dana Denton (dentond@clintonschools.org), Clinton Elementary School, Clinton, Tenn.
Need a ready-made cross-curricular unit that is research based, relevant, and rigorous? This workshop is for you! One participant will win free materials.

Stop by Booth #142 to see our latest products and enter to win science prizes!

Take The Ward’s Pure Challenge
Introducing Ward’s Pure Preserved, the Best Dissection Experience from Start to Finish!
At the Core of STEM: A Tale of Integrated Lessons for Middle School Students  
(Grades 6–8)  
Broadway D, Omni  
Science Focus: ESS, LS, PS, SEP2, SEP5, SEP6  
Adaliz Gonzalez (@adalizg310; adaliz@rocketmail.com), New York City (N.Y.) Dept. of Education  
Engage in two different integrated activities that meet CCSS ELA and the NGSS: forces, motion, and the solar system and ecosystems. Both activities emphasize the integration of math and science as well as engineering practices. Receive materials and handouts.

Why Can’t I Be Michael Jordan? A Planning Tool for Designing Engaging NGSS-Focused Science Units  
(Grades 7–12)  
Legends B, Omni  
Science Focus: GEN, NGSS  
Nicole Lum (@ScienceFunFacts; nicole.peach.lum@gmail.com), Orr Academy High School, Chicago, Ill.  
Alissa Berg (aberg@auslchicago.org), Academy for Urban School Leadership (AUSL), Chicago, Ill.  
Explore a tried-and-true tool for planning NGSS units around engaging phenomena. Collaboratively plan your own unit and leave with resources for creating many more!

Creating a Real-World Experience for All Students in STEM  
(Grades K–12)  
Legends C, Omni  
Science Focus: GEN, SEP  
Jordan Menning (@JordanMenning; jmenning@nwaea.org), Northwest Area Education Agency, Sioux Center, Iowa  
April Tidwell (@AprilTidwell; tidwela@live.siouxcityschools.com), Sioux City (Iowa) Community Schools  
What makes a real-world STEM experience? Join us and experience a hands-on STEM challenge and receive resources supported by research and data.

BSCS Pathway Session: Taking the Lead with the NGSS  
(Grades K–12)  
Legends D, Omni  
Science Focus: GEN, NGSS  
Paul Numedahl, BSCS, Colorado Springs, Colo.  
What does it take to lead K–12 teachers to understand and support three-dimensional learning in science? We will explore the opportunities and challenges of the NGSS for teacher leaders, district leaders, and professional developers. Not only will we cover ways to create a supportive environment for rich and critical conversations about teaching and learning, we’ll unpack the significant changes necessary to bring the NGSS to life in the classroom.

The Lab-O-Matic: Meet Your Classroom’s New Best Friend  
(Grades 6–12)  
Legends E, Omni  
Science Focus: GEN, SEP1, SEP3, SEP4, SEP6, SEP7, SEP8  
Eric Hall (@hallscience; eric.hall@dmschools.org) and Maureen Griffin (@HHSProlearn; maureen.griffin@dmschools.org), Hoover High School, Des Moines, Iowa  
Participants will sit, stay, and roll with the Lab-O-Matic. This tool helps organize students when evaluating and designing experiments. You will leave begging for more!

Crunching the Numbers: Novel Ways to Implement Graphing and Data Analysis into Your Curriculum  
(Grades 6–College)  
Legends F, Omni  
Science Focus: GEN, SEP4, SEP5, SEP8  
Melissa Fischer, Vanderbilt Center for Science Outreach, Nashville, Tenn.  
Learn the basics of using graphing in your classroom and how to encourage students to analyze their data for any discipline you teach.

Science Explorations with Deaf and Hard-of-Hearing Students  
(Grades K–12)  
Legends G, Omni  
Science Focus: ESS, ETS, LS, PS, CSS, SEP2, SEP8  
Explore ways to engage deaf and hard-of-hearing students in science explorations, and engage all students by using American Sign Language.

Earthquake! Integrating CCSS and NGSS in the Elementary Science and Engineering Classroom  
(Grades K–5)  
Music Row 5, Omni  
Science Focus: ESS3.B, ETS1, CCC, SEP  
Rosita Young (rosita.young@ousd.k12.ca.us) and Brenda Tuohy (brenda.tuohy@ousd.org), Oakland (Calif.) Unified School District  
Engage in an engineering challenge that addresses a California problem while applying NGSS engineering design principles and addressing CCSS. All teaching materials provided.  
Note: Hands-on activities available to the first 30 participants.
Paul George’s Injury: The Impact of Whole-Class Modeling on Discussion  
(Grades 5–12) Center Ballroom, Renaissance  
Science Focus: GEN, SEP2, SEP7, SEP8  
Darrin Collins (d.a.collins1831@gmail.com), Wendell Phillips Academy High School, Chicago, Ill.  
Explore the research-based approaches to engaging students in modeling in science. Develop an NGSS-focused curriculum that is relevant and content rich.

8:00–9:30 AM  Exhibitor Workshops  
AP Environmental: Using Your Stream to Teach STEM-Based Skills  
(Grade 12) 107A, Music City Center  
Sponsor: LaMotte Co.  
Tim Trumbauer, Chester River Association, Chestertown, Md.  
Is the stream behind our school healthy? Don’t miss this informative workshop with an actual watershed manager that covers field techniques for collecting and analyzing samples, use of public data, common surface water pollutants, and ways to research potential pollution sources. Upon completion, you will be able to use the Water Quality Index to teach STEM-based skills and successfully implement a water quality component to your AP Environmental curriculum.

Albert Einstein Distinguished Educator Fellowship Program: Exciting Opportunities for K–12 STEM Educators to Influence Federal Programs and Policy in Washington, D.C.  
(Grades K–12) 107B, Music City Center  
Science Focus: GEN  
Sponsor: Albert Einstein Distinguished Educator Fellowship Program  
Patti Obenour (einsteinfellow@orise.orau.gov), Albert Einstein Distinguished Educator Fellowship Program, Oak Ridge, Tenn.  
Learn how Einstein Fellows are using their experience as K–12 STEM educators to influence federal STEM education legislation, programs, and policy in Congressional offices and the U.S. Department of Energy, NSF, and NASA. Find out what Fellows do and learn, what Fellowship benefits are offered, and how to apply.

8:00–9:30 AM  Meeting  
Science Matters State Coordinators Meeting  
(By Invitation Only)  Music Row 4, Omni

Contextualizing Science Literacy with Agriculture  
(Grades K–12) 108, Music City Center  
Science Focus: GEN  
Sponsor: National Agriculture in the Classroom  
Debra Spielmaker (debra.spielmaker@usu.edu), National Agriculture in the Classroom, Logan, Utah  
Investigate how science literacy concepts can be easily understood within the context of agriculture. Explore how authentic examples in agriculture address the nature of science, demonstrate scientific advancements, and continue to engage research and engineering efforts to meet our current and future needs. Several free classroom-ready resources will be demonstrated.

Development of a Science Maker Kit for Inquiry-Based Teaching: Ideation and Feedback  
(Grades 6–12) 110A, Music City Center  
Science Focus: GEN  
Sponsor: Microsoft  
Todd Beard (v-tobear@microsoft.com), Microsoft Innovative Educator Fellow, Detroit, Mich.  
Participate in a set of Project-Based Learning activities to help inform the development of a tool kit for STE(A)M. BYOD for this hands-on session and share your current practices and unmet needs integrating tools into curriculum design. Your great ideas are instrumental into the creation of this tool kit.
Cereal City Science: Going Great Lengths Toward the NGSS
(Grades K–8) 110B, Music City Center
Science Focus: PS1.A, PS2
Sponsor: Battle Creek Area Mathematics and Science Center
Nancy Karre (nancy@bcamsc.org), Battle Creek Area Mathematics and Science Center, Battle Creek, Mich.
Explore NGSS-focused material for kindergarten through middle school that engages students in science concepts through phenomena and natural curiosity. The Battle Creek Area Mathematics and Science Center (BCAMSC) Cereal City Science program offers science units in which students are active learners through science and engineering.

Engagement Unlocked! Using Learning Games for STEM
(Grades K–12) 201B, Music City Center
Science Focus: INF
Sponsor: McGraw-Hill Education
Dan White, Filament Games, Madison, Wis.
STEM learning is important for equipping students with transferable 21st-century skills, but how do we make sure students are engaged with that content? In this workshop, Dan White, CEO of Filament Games, will discuss the ways that game-based learning shines when it comes to teaching STEM concepts.

Self-Propelled Vehicles! Constructing Engaging Engineering Experiences Using NGSS Performance Expectations
(Grades 6–8) 202B, Music City Center
Science Focus: ETS, CCC, SEP
Sponsor: Houghton Mifflin Harcourt
Michael DiSpezio, Author and STEM Specialist, North Falmouth, Mass.
Here’s your chance to learn the basic teaching tenets of engineering as prescribed by grades 6–8 performance expectations. Learn and have fun as you participate in grade-appropriate activities that profile the NGSS approach to engineering and use inexpensive and easy-to-obtain materials. The final product: a mousetrap car!

Tracking Student Growth in Science Practices
(Grades 6–8) 202C, Music City Center
Science Focus: ESS, LS, PS
Sponsor: Inq-ITS
Janice Gobert (info@inqits.com), Rutgers, The State University of New Jersey, New Brunswick
Cameron Betts (info@inqits.com) and Charity Staudenraus (info@inqits.com), Inq-ITS, Worcester, Mass.
For the first time, Inq-ITS has made it possible to track student growth in science practices. We will work through the process of identifying independent and dependent variables applied to virtual labs in life, physical, and Earth science to help overcome student misconceptions. Focus will be on topics that cannot be assessed in an inquiry fashion in a hands-on lab. Bringing a device with internet access is highly encouraged.

Interactive Case Studies: Supplemental Software to Improve Critical Thinking in the Biology Classroom
(Grades 9–12) 205B, Music City Center
Science Focus: LS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Instead of reading a case study, experience one! Interactive case studies enable students to explore a variety of science careers, interact with the molecular world, and learn difficult biological concepts. Case studies have been proven by NSF and NIH research to improve learning and critical-thinking skills. Try one in this hands-on workshop!

Convection Currents and Plate Motion
(Grades 6–8) 205C, Music City Center
Science Focus: ESS2.B
Sponsor: LAB-AIDS®, Inc.
Mark Koker, LAB-AIDS, Inc., Ronkonkoma, N.Y.
Investigate and model convection currents using unique LAB-AIDS/SEPUP materials to develop an operational understanding of the between water temperature and its movement. The hands-on experience with convection in water coupled with the knowledge of Earth’s interior is combined to explain the motion of Earth’s tectonic plates and how that motion causes major geological events.
Forensic Science for High School, 3rd Edition
(Grades 9–12) 206 A/B, Music City Center
Science Focus: GEN
Sponsor: Kendall Hunt Publishing Co.
Barbara Ball (barbanajuliene@yahoo.com), Science Educator, Holt, Mich.
CSI and media influences have students interested in how science relates to the real world. The author will present from the new edition of Forensic Science for High School, an inquiry curriculum that uses labs and digital tools to help you effectively teach forensics through problem solving and analytical thinking.

Vampire Chronicles: Sink Your Teeth into Genetics and Blood Typing
(Grades 7–12) 207A, Music City Center
Science Focus: LS
Sponsor: Ward’s Science
Kelly Smith and Michelle Pagani, VWR Science Education, Rochester, N.Y.
The talk of Bedford is that there are vampires living amongst the townspeople who prefer to feast on rare blood types. They, therefore, frequent large town gatherings. You, a vampire eradication committee member, will help investigate who may be at high risk of becoming a vampire’s next meal using Ward’s Simulated Blood. Explore techniques for extending learning beyond blood typing using animal blood microscope slides and simulated blood-testing techniques.

Zombie Apocalypse!
(Grades 6–12) 207B, Music City Center
Science Focus: LS
Sponsor: Texas Instruments
Jeffrey Lukens, Sioux Falls (S.Dak.) School District
Become part of a zombie apocalypse as brains will be served (while supplies last). Learn about disease-spread modeling using simulations and fun storylines about a zombie outbreak. Applicable for middle school and high school, this workshop is sure to scare you and your little zombies into learning how exciting Hollywood themes can be used to teach science concepts.

Help us with your feedback...and get a chance for a free Apple iPad mini 2

We’re giving you one more reason to evaluate conference sessions.

When you log on to www.nsta.org/nashvillebrowser and fill out an evaluation by clicking on the “evaluate session” button below the session you attended, you get entered into a drawing for a chance to win an Apple iPad mini 2 Wi-Fi tablet courtesy of the NSTA Conference Department.

Your feedback helps us in creating the best conference experience for you and other attendees.

• WE’RE GIVING AWAY Two APPLE iPad MINI 2 WI-FI TABLETS

• CONFERENCE APP

Scan QR code below to access our NSTA Conference App.
Chemistry with Vernier
(Grades 9–College) 207C, Music City Center
Science Focus: PS, SEP
Sponsor: Vernier Software & Technology
Jack Randall (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
Use Vernier sensors to conduct a variety of chemistry experiments from our popular lab books in this engaging hands-on workshop. Collect and analyze data using LabQuest 2 and Logger Pro computer software. Explore the wide range of tools from Vernier that promotes understanding of chemistry concepts.

Integrating Chromebook with Vernier Technology
(Grades 3–College) 207D, Music City Center
Science Focus: GEN, NGSS
Sponsor: Vernier Software & Technology
Verle Walters (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
Learn how to use Chromebooks with Vernier technology in this workshop featuring experiments from Vernier lab books. See how engaging experiments like “Boyle’s Law” or “Grip Strength Comparison” teach students about data collection and analysis—practices that promote science inquiry and boost test scores.

Get That Grant Money!
(Grades 6–12) 208A, Music City Center
Science Focus: GEN
Sponsor: Bio-Rad Laboratories
Successful grant writing isn’t rocket science, but it can take your teaching to new heights. Experienced grant writers will share some powerful tips for success to get you to the next level. Bring in any grant you wish to apply for and get your questions answered during this interactive workshop.

Circuits as Crayons: Crafting Interactive Circuits with Circuit Stickers
(Grades 2–8) 208B, Music City Center
Science Focus: PS
Sponsor: Chibitronics
Patricia Ng and Alisha Panjwani (alisha@chibitronics.com), Chibitronics, Lewes, Del.
This workshop will demonstrate how to introduce electronics through fun arts and craft activities. Participants will craft their own circuits on paper with Chibitronics Circuit Stickers, tiny peel-and-stick electronic parts that you can use to make interactive light projects. Join us and express yourself with electronics!

Engage with NGSS Using STEM Gauge™
(Grades 6–8) 209B, Music City Center
Science Focus: GEN, NGSS
Sponsor: Measured Progress
Susan Tierney and Janet Dykstra, Measured Progress, Dover, N.H.
Learn strategies for transitioning to NGSS and gathering evidence of three-dimensional learning using STEM Gauge formative assessment tools. This interactive workshop highlights a variety of classroom strategies to engage students with assessment questions, rubrics, and self-reflection templates. Participants will get a free Middle School STEM Gauge item set!

Implementing Three-Dimensional Learning
(Grades 6–12) 209C, Music City Center
Science Focus: GEN, NGSS
Sponsor: AquaPhoenix Education
Roxane Ohl (rohl@aquaphoenixsci.com), AquaPhoenix Scientific Inc., Hanover, Pa.
Looking for teaching strategies to develop scientifically competent students empowered with problem-solving skills? Come experience fingerprinting processes in the realm of the NGSS crosscutting concepts, disciplinary core ideas, and science and engineering practices. Partner with Kemtec to transition the focus from teaching and learning to understanding and applying.

Living By Chemistry: Pass the Proton—Acids and Bases
(Grades 9–12) 210, Music City Center
Science Focus: PS
Sponsor: Bedford, Freeman, & Worth High School Publishers
Teach rigorous chemistry with guided inquiry! Let’s explore activities that help students understand theories of acids and bases and other core chemistry concepts through the context of toxicity. Take home free sample lessons and materials from the Living By Chemistry (2nd ed.) curriculum.
Proteins Are the Cash of Biotech
(Grades 9–College) 212, Music City Center
Science Focus: LS
Sponsor: G-Biosciences
Ellyn Daugherty, Biotechnology Educator, Redwood City, Calif.
Proteins are usually colorless and always submicroscopic. How can scientists know they have an active protein and determine how much protein they have? Join Ellyn Daugherty, biotechnology educator/author, in this hands-on workshop to conduct three assays showing the presence and relative activity of two different types of amylase.

Discourse Tools for Equitable and Rigorous Talk
(Grades 5–8) 214, Music City Center
Science Focus: GEN, SEP
Sponsor: Activate Learning
Heather Milo (hmilo@activatelearning.com), Activate Learning, Greenwich, Conn.
The Framework promotes learning as a fundamentally social endeavor supported by collaborative and communicative norms. Yet, sustaining these norms requires all members to articulate, make sense of, and evaluate each other’s ideas, making discourse tools vitally important. Walk away with ready-to-use tools that foster productive talk around big science ideas!

8:00–11:00 AM Short Courses

Building Better Lessons: NGSS Classroom Redesign (SC-11)
(Grades K–12) Tickets Required; $28 Davidson, Sheraton
Science Focus: GEN, NGSS
Zoe Evans (@zoe_evans; zoeevans@carrollcountyschools.com), Villa Rica High School, Villa Rica, Ga.
Chris Embry Mohr (chrisembry.mohr@olympia.org), Olympia High School, Stanford, Ill.
Jeremy Peacock (jeremy.peacock@negaresa.org), Northeast Georgia RESA, Winterville, Ga.
Julie Olson (julie.olson@k12.sd.us), Mitchell High School, Mitchell, S.Dak.
For description, see Volume 1, page 57.

Models: Key to Making Thinking Visible (SC-12)
(Grades 3–8) Tickets Required; $31 Suite 5A, Sheraton
Science Focus: ETS1, PS1.A PS3.B, PS3.C, CCC1, CCC2, CCC4, CCC5, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8
Diana Velez (@dlvelez; dvelez@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley
Claudio Vargas (claudio.vargas@ousd.org), Oakland (Calif.) Unified School District
For description, see Volume 1, page 57.

8:15–9:15 AM Meeting
Past Presidents Advisory Board Meeting
Legends A, Omni
8:30–9:00 AM  Presentations

Little Learners, BIG Ideas: Innovative Thinking in Early Childhood
(Grades P–3)  101E, Music City Center
Science Focus: GEN
Allison Bemiss (@LittleInnovator; allison.bemiss@wku.edu), Western Kentucky University, Bowling Green
Childhood is a magical time full of curiosity and wonder. I’ll share strategies to help little learners play, explore, and develop innovative thinking skills.

Influence of 1:1 Chromebooks on Student Learning and Associated Professional Development Strategies
(Grades 3–8)  Davidson A2/3, Music City Center
Science Focus: GEN
Miles McGeehan (miles.mcgeehan@gmail.com), Bozeman (Mont.) Public Schools
Nicholas Lux (nicholas.lux@montana.edu), Montana State University, Bozeman
Join us as we highlight the impacts of 1:1 Chromebook devices in grades 3–8 that were compiled in a formal mixed-methods research evaluation. Discussion includes strengths of ongoing teacher professional development and collaboration strategies.

Smithsonian National Air and Space Museum Exhibits as Sources for STEM Investigations
(General)  Acoustic, Omni
Science Focus: ESS, ETS, INF, CCC3, CCC4, CCC6, SEP2, SEP4, SEP6, SEP7, SEP8
Katie Nagy (nagyks@si.edu) and Martin Kelsey (@STE-Min30; kelsey@si.edu), Smithsonian National Air and Space Museum, Washington, D.C.
Explore object-based learning and techniques for using museum field trips as opportunities for students to collect data that they’ll use in the classroom.

Simple Use of Scientific Models in High School Chemistry and Physical Science
(Grades 7–12)  Broadway A, Omni
Science Focus: PS1.A, CCC4, SEP2
Kelly Ramey (@kellyramey; kramey@tntech.edu), Tennessee Tech University, Cookeville
Chemistry knowledge is especially difficult for students based on the interplay between the submicroscopic (atoms and molecules) and the macroscopic (observable) views. I’ll highlight simple activities to help students understand the use of models and visualize matter as they connect these views.

Integrated STEM Learning with the ASSIST Teaching Approach
(General)  Broadway B, Omni
Science Focus: GEN
Mark McDermott (@CollegeofEdSTEM; mark-a-mcdermott@uiowa.edu), The University of Iowa, Iowa City
Laura Wood (@MP_LWood; laura.wood@mpcsd.org), Mount Pleasant Middle School, Mount Pleasant, Iowa
Mason Kuhn, University of Northern Iowa, Cedar Falls
Darrin Ellsworth (@DarrinEllsworth; ellsworthdarrin@gmail.com), Xavier High School, Cedar Rapids, Iowa
Argument-based Strategies for STEM Infused Science Teaching (ASSIST) is a research-supported comprehensive approach to developing engaging STEM learning environments built on argument-based instruction.

Learning to Teach Science in an Online Environment
(Grades 5–College)  Broadway G, Omni
Science Focus: GEN, SEP
Lori Fulton (fultonl@hawaii.edu) and Jon Yoshioka (jonyoshi@hawaii.edu), University of Hawaii at Manoa, Honolulu
Online classes can be challenging in the sciences. Join us as we explore possibilities and outcomes for a hybrid course focused on preparing science educators.

Coding Contagion: Teaching Computational Thinking and Scientific Modeling by Having Students Develop Simulations of an Outbreak
(Grades 6–12)  Broadway J, Omni
Science Focus: LS2.A, LS2.C, CCC4, CCC7, SEP
Adam Colestock (acoleston@fwparker.org) and Kara Schupp (kschupp@fwparker.org), Francis W. Parker School, Chicago
Come hear how students programmed an epidemic simulation using StarLogo, conducted experiments and extended their models to incorporate additional factors influencing the spread of disease.

Teach Your Students to Consciously Replace Misconceptions with Sound Scientific Knowledge
(Grades 2–College)  Cumberland 2, Omni
Science Focus: GEN
Duane Stilwell (dstilwell57@yahoo.com), Nyack (N.Y.) Public Schools
Charles Sincerbeaux (sincerbeaux@yahoo.com), George Washington Elementary School, White Plains, N.Y.
Students are not blank slates. They may have very robust misconceptions that must be addressed if they are to replace these with robust scientific understanding.
Making Students Scientists
(General) Fisk One, Renaissance
Science Focus: GEN, NGSS
Kathy Biernat, St. Mary’s Visitation School, Franklin, Wis.
Dislike hearing “When will we ever use this?” Leave with ways to integrate real-world citizen science projects into your classroom.

8:30–9:30 AM Presentation
Teacher Researcher Day Session: Poster Session
(General) East Ballroom, Renaissance
Science Focus: GEN, NGSS
Deborah Roberts-Harris (drober02@unm.edu), The University of New Mexico, Albuquerque
Find out what questions teachers and teacher educators are asking and how they are exploring these in their own classrooms.

8:30–10:00 AM Meeting
Shell Breakfast Meeting
(By Invitation Only) Ryman One, Renaissance

9:00 AM–3:00 PM Short Course
Is It Spring Yet? Field Studies with Middle School Citizen Scientists (SC-14)
(Genres K–12) Tickets Required; $60 Suite 7A, Sheraton
Science Focus: INF, LS1, LS2, CCC1, CCC6, SEP1, SEP3
Candyce Johnson (cjohnson@bbg.org), Brooklyn Botanic Garden, Brooklyn, N.Y.
Judith Hutton (jhutton@nybg.org), The New York Botanical Garden, Bronx
Deborah Sarria (dsarria@schools.nyc.gov), Andries Hudde Junior High School, Brooklyn, N.Y.
For description, see Volume 1, page 58.
Saturday, 9:00–10:30 AM

9:00–10:30 AM  Exhibitor Workshop
Climate Changes Series I: Polar Popsicles—Life in the Ice
(Grades 6–12) 201A, Music City Center
Science Focus: ESS3
Sponsor: NOAA Ocean Service
Louise Huffman (louise.t.huffman@dartmouth.edu), Thayer School of Engineering at Dartmouth, Hanover, N.H.
What kind of life exists in glacial environments? How can new biological records from Antarctic ice cores inform our understanding of climate change? Polar scientist Christine Foreman will share the excitement of her latest research; proven hands-on activities will bring this home to your classroom.

9:00–11:00 AM  Meeting
Teaming Up for STEM: Team Discussion and Planning Meeting
(By Invitation Only) Grand Ballroom A1, Music City Center

9:00 AM–3:00 PM  Exhibits
Hall B, Music City Center
The NSTA Exhibit Hall is a must-see! NSTA brings you the leading science education companies and organizations to showcase products, services, curricula, and much more. You'll discover something new and exciting in the world of science teaching. Some exhibitors will offer materials for sale.

9:00 AM–5:00 PM  Networking Opportunity
NSTA International Lounge  Mockingbird 1, Omni
Please stop by the NSTA International Lounge to relax or meet colleagues while you're at the conference. The lounge is open Thursday through Saturday, 9:00 AM–5:00 PM.

9:30–10:00 AM  Presentations
Integrating Probes in the Interactive Notebook: The More You Put “IN” the More You Get “OUT!”
(Grades 7–12) Acoustic, Omni
Science Focus: GEN
Jen MacColl (jmaccoll@susd.org), Chaparral High School, Scottsdale, Ariz.
The Interactive Notebook activates students’ prior knowledge and uncovers their misconceptions. It allows students to demonstrate how much they learned, allows for infinite variation, and forces students to truly understand material, as opposed to simple memorization.

Who’s Afraid of the Big Idea? Teaching About Ecosystems by Examining Wolves and Their Food Chains
(Grades 9–12) Cumberland 4, Omni
Science Focus: LS2
Sanya Sidhu, Lakehead University, Thunder Bay, Ont., Canada
Big Ideas–based case studies to teach “sustainable ecosystems” using wolves in Yellowstone and Isle Royale National Parks? Yes, it works!

Teaching and Learning: Perspective on K–12 from Scientists
(Grades K–12) Fisk One, Renaissance
Science Focus: GEN, NGSS
Margery Gardner (magard01@syr.edu) and John Tillotson (@johnwtillotson; jwtillot@syr.edu), Syracuse University, Syracuse, N.Y.
Gain insights from scientists on K–12 classroom teaching experiences. Through the lens of science education outsiders, we will share a study that provides refreshing insights on science teaching practices.

Primary Students and Teachers Practicing Authentic Engineering Practices: Look, Draw, Build, and Do It Again!
(Grades K–1/College) Music City Ballroom, Renaissance
Science Focus: ETS1.A, ETS1.B, SEP
Alicia McDyre (@amcdyre; axd252@psu.edu), Pennsylvania State University, University Park
Jill Corkery (jcw19@scasd.org), State College (Pa.) Area School District
Jessica Jeffries (@jessjeffries12; jlc31@scasd.org), Gray’s Woods Elementary School, Port Matilda, Pa.
Participants will have the opportunity to view students and teachers collaboratively working on solving authentic problems while employing NGSS engineering practices in two primary classrooms.
Saturday, 9:30–10:30 AM

**Paul F-Brandwein Lecture**

*Love: The Four-Letter Word That Science Forgot*  
(General)  
Grand Ballroom C2, Music City Center  
Science Focus: ESS3, LS

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

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

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

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

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


---

**NSTA Committee, Advisory Board, and Panel Chairs Meeting**  
(By Invitation Only)  
Mockingbird 2, Omni

**Presentations**

*Teaching Macromolecules Through the Lens of Nutrition*  
(Grades 9–12)  
101 A/B, Music City Center  
Science Focus: GEN

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

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

*Engineering Remotely Operated Vehicles Incorporates Three-Dimensional Learning to Improve Student Achievement*  
(Grades 6–12)  
103A, Music City Center  
Science Focus: ETS

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

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

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

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

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

*Science Ambassadors: Partnering Elementary and High Schools for STEM Night Events*  
(Grades 1–5/9–12)  
103B, Music City Center  
Science Focus: INF, SEP3

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

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

Science Ambassadors are high school students who take science to local elementary schools. Find out how to begin and implement this program in your district.
NGSS and CCSS Mashup: Science Museum Transforms Teaching (Grades K–6) 103C, Music City Center
Science Focus: GEN, NGSS
Deanna Wheeler (@sciwheeler; dwheeler@ccboe.com), J.C. Parks Elementary School, Indian Head, Md.
What happens to a school when they create a science museum… total teaching transformation! Experience how J. C. Parks Elementary changed from teaching to facilitating during a five-week inquiry-based environmental investigation. Starting from student questions, follow the journey of teachers and students as they move through the process of inquiry and student-led investigations while meeting the CCSS and NGSS.

Using the 2017 U.S. Total Solar Eclipse to Promote Educational Outreach (General) 104A, Music City Center
Science Focus: ESS, INF
Charles Fulco (@totality2017; sans61@gmail.com), Professional Development Consultant, Otis, Mass.
Take advantage of a rare and spectacular celestial event to promote science literacy in your school and community while dispelling myths about eclipses through cross-content lessons.

Science Notebooks: Tools to Develop Scientific Practices and Student Learning (Grades K–6) 104B, Music City Center
Science Focus: GEN, NGSS
Lori Fulton (fultonl@hawaii.edu), University of Hawaii at Manoa, Honolulu
When used insightfully, science notebooks help students develop scientific understandings. We will examine strategies that help teachers implement science notebooks in an insightful manner.

Argument-Driven Inquiry with Science Writing in the K–5 Classroom (Grades K–5) 104D, Music City Center
Science Focus: GEN, SEP7
David E. Johnson (johnson.david@outlook.com), Perkiomen Valley School District, Collegeville, Pa.
Can argument-driven inquiry drive science writing in an elementary classroom? Emphasis will be placed on writing strategies focused on justifying claims with evidence and reasoning.

Building Claims, Evidence, Reasoning (CER) Skills Through a Pink Palace Museum and Shelby County Schools Collaboration (Grades K–8) 105B, Music City Center
Science Focus: GEN
Alex Eilers (alex.eilers@memphistn.gov), The Pink Palace Museum, Memphis, Tenn.
Explore literacy-supported investigations with electromagnetism from Memphis’ Pink Palace Museum that help urban students from Shelby County Schools develop claims, evidence, and reasoning skills.

Adopting, Adapting, and Applying the 5E Instructional Model to Enhance Science Experiences for Students with Special Needs (Grades P–5) 106A, Music City Center
Science Focus: GEN, SEP3, SEP6, SEP8
Gregory Borman (gborman@schools.nyc.gov), New York City (N.Y.) Dept. of Education
Derek Ramdass (dramdas@schools.nyc.gov), P.S. K004, Brooklyn, N.Y.
Lionel Callender (lionel387@aol.com), P.S. Q993, Floral Park, N.Y.
Deborah Charles (dcharles2@schools.nyc.gov), P4K@P843K, Brooklyn, N.Y.
Special educators have modified the 5Es (Engage, Explore, Explain, Elaborate, and Evaluate) to provide effective science experiences for students with special needs through an interdisciplinary center-based learning approach.

Old Dog, New Tricks: Transitioning to Engineering and Design Challenges (Grades K–8) Davidson A2/3, Music City Center
Science Focus: ETS, SEP6
Larry Plank (larry.plank@sdhc.k12.fl.us), Shana Tirado (shana.tirado@sdhc.k12.fl.us), and Michele Wiehagen (michele.wiehagen@sdhc.k12.fl.us), Hillsborough County Public Schools, Tampa, Fla.
Design competitions have been a part of science instruction for years, however, true engineering experiences require multiple iterations along with evolving constraints.
NGSS Share-a-Thon  
(Grades K–12)  
Grand Ballroom C1, Music City Center  
Science Focus: GEN, NGSS  
Presider: Ted Willard (twillard@nsta.org), Program Director, NGSS@NSTA, NSTA, Arlington, Va.  
Would you like a chance to talk to colleagues about how they have implemented NGSS? At the NGSS@NSTA Share-a-Thon, get tips and tools to implement three-dimensional standards from NSTA’s NGSS Curators, NGSS writers, and other education experts. Leave with plenty of handouts and ideas you can use in your classroom right away!

STEM Learning Ecosystems  
(General)  
Broadway A, Omni  
Science Focus: GEN  
Gerald Solomon (@geraldrsolomon; gsolomon@samueli.org), Co-Chair STEM Funders Network, and Samueli Foundation, Corona Del Mar, Calif.  
Hear from the STEM Funders Network on the history—and findings—of their national STEM Ecosystem Initiative involving 27 cities around the country.

Enhancing and Integrating NGSS Strands Through Appropriate Uses of Technology  
(Grades 7–12)  
Broadway G, Omni  
Science Focus: GEN, NGSS  
Marion Reeves (marion-reeves@comcast.net), Science Education Consultant, Decatur, Ga.  
When both students and teachers use technology as a norm, creative application of the tools can enhance lessons as the three strands of NGSS are woven together.

Building Capacity for NGSS in Your District  
(Grades 6–12)  
Broadway H, Omni  
Science Focus: GEN, NGSS  
David Helm (david.helm@fayette.kyschools.us), Fayette County Public Schools, Lexington, Ky.  
Mary Elizabeth McKnight (mary.mcknight@fayette.kyschools.us), Tates Creek Middle School, Lexington, Ky.  
Listen to a group of teachers as they discuss how they are helping their science teachers grow in NGSS understanding.

I CAN Ask a Question! DID I Define a Problem?  
(General)  
Cumberland 2, Omni  
Science Focus: GEN, SEP  
Holly Rosa (@BPSScienceHolly; hrosa@bostonpublicschools.org) and Pamela Pelletier (@BPSSciencePam; ppelletier@bostonpublicschools.org), Boston (Mass.) Public Schools  
Join us as we introduce a new tool designed to make the science and engineering practices more student, teacher, and community friendly.
Differentiating Life Science NGSS for Lower-Level Students
(Grades 9–12) Cumberland 3, Omni
Science Focus: LS
Justin Stroh (@StrohCity; jstroh1124@gmail.com), Barrington High School, Barrington, Ill.
Join me as I share experiences, learning targets, lessons, and activities related to modifying our co-taught lower-level biology classes based on the NGSS.

Using a Model of Shared Language to Build Science Literacy
(General) Cumberland 5, Omni
Science Focus: GEN, NGSS
Kate Baird (@77350goldendreams; kabaird@iupuc.edu), Indiana University–Purdue University Columbus
Stephanie Coy (scoy@iupuc.edu), Inglewood Elementary School, Nashville, Tenn.
Too often science is taught just as vocabulary. Join us as we share our language model that brings together personal understanding with scientific vocabulary through notebooks.

ICARUS
(Grades 3–College) Electric, Omni
Ted Neal (ted-neal@uiowa.edu), The University of Iowa, Iowa City
Space—an obtainable frontier. Explore how to collect real data, including temperature, altitude, rates of accent/decent, CO₂, O₂, and more. Join in for inquiry-based investigations for teachers.

Students Solving Real-World Problems
(Grades K–12) Mockingbird 4, Omni
Science Focus: PS3.A, PS4, CCC5, SEP1, SEP3, SEP4, SEP8
Jessica Gaither (@ElemSciTchr; jfriesgaither@gmail.com), L. Paige Gullett (gullettscience@gmail.com), and Ann Marie McDonnell (ammacdonnell@columbusschoolforgirls.org), Columbus School for Girls, Columbus, Ohio
Learn how to plan an authentic schoolwide inquiry investigation solving a real-world problem. Easy-to-use handouts and examples included from our K–12 Dining Room Sound Study.

Engage with Engineering: Preparing a Science Department to Integrate Engineering Practices into Its Courses
(Grades 9–12) Music Row 1, Omni
Science Focus: ETS, SEP
Amy Winston (amy_winston@newton.k12.ma.us), Newton North High School, Newton, Mass.
Baby steps, professional development, and fun! Hear one administrator’s experience preparing a science department to infuse engineering into its science instruction.

STEM Teacher Liability: Walking on the Safer Side!
(Grades 1–12) Music Row 2, Omni
Science Focus: ETS2, SEP
Kenneth Roy (@drroysafersci; royk@glastonburyus.org), Glastonbury (Conn.) Public Schools
Tyler Love (@UMES_Tech_Dpt; tslove@umes.edu), University of Maryland Eastern Shore, Princess Anne
A STEM lab can be an unsafe place! Learn strategies to make activities and demos safer to reduce the risk of accidents and teacher liability.

Equity: Buzzword or Catalyst During a District Transition to the NGSS
(Grades K–12) Music Row 5, Omni
Science Focus: GEN
Thomas Reinhardt (reinhardt.biology@gmail.com), Oakland (Calif.) Unified School District
Learn from Oakland, California, science specialists who maintain a focus on equity during districtwide curriculum development and professional learning. Participants will investigate strategies to apply to their NGSS transition.

What Do They Think? Engaging and Assessing Through the Use of Visual Media
(General) Fisk Two, Renaissance
Science Focus: GEN
Vicki Massey (vickimassey@cox.net), Higley Unified School District #60, Gilbert, Ariz.
Grab your students’ attention and find out what they are thinking by using cartoons, engaging visuals, and short videos. List of resources provided.

Promoting Scientific Reasoning Through Writing
(Grades 5–12) West Ballroom, Renaissance
Science Focus: GEN
Missy Brooks (@wildmanbrooks; brooksm@mtbbrk.k12.al.us), Mountain Brook Schools, Birmingham, Ala.
Practical processes and protocols for implementing writing in the science classroom will be shared. Writing allows students to communicate deeper understanding and scientific reasoning.
9:30–10:30 AM  Hands-On Workshops

NSTA Press® Session: Solar Astronomy Curriculum Resource That meets the NGSS = Getting Ready for the All-American Eclipse
(Grades 5–9) 101C, Music City Center
Science Focus: ESS, CCC1, CCC2

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

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

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

Leith Nye (@GLBioenergy; leith.nye@wisc.edu), University of Wisconsin—Madison

John Greenler, Great Lakes and Bioenergy Research Center, Madison, Wis.

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

Meaningful Integration Between STEM Subjects in the Elementary Classroom
(Grades 1–5) 104C, Music City Center
Science Focus: ETS2, SEP

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

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

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

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

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

Black Holes Suck!
(Grades 7–College) 105A, Music City Center
Science Focus: ESS1, PS2

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

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

Using Lab Notebooks in the Preschool and Elementary Classroom
(Grades P–5) 106B, Music City Center
Science Focus: GEN, SEP

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

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

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

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

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

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

Michael Passow (michael@earth2class.org), Dwight Morrow High School, Englewood, N.J.

Carla McAuliffe (carla_mcauliffe@terc.edu), TERC, Cambridge, Mass.

Join more than 20 NESTA members and other education specialists as they share their favorite classroom activities. Lots of free handouts!
Games in Science! How to Use Them Effectively!  
(Grades 3–10)  
Science Focus: ETS1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8  
Judith Lucas-Odom, Chester High School, Chester, Pa.  
Using the engineering design process, students will develop usable games to connect the CCSS and NGSS.

Engage Families with Your STEM Teaching  
(Grades K–12)  
Science Focus: INF, SEP  
Jake Noel-Storr (@noelstoj; drijkens@gmail.com), Insight-STEM, Inc., Tucson, Ariz.  
Learn how to engage whole families in science by inviting them within your walls and helping them create their own learning opportunities beyond school.

BSCS Pathway Session: Using the BSCS 5E Instructional Model to Promote Three-Dimensional Learning  
(Grades 3–12)  
Science Focus: GEN, NGSS  
Paul Numedahl, BSCS, Colorado Springs, Colo.  
This interactive session will deepen participant understanding of the BSCS 5E instructional model (Engage, Explore, Explain, Elaborate, and Evaluate) and how this model can be used to promote and support science learning for all students.

Building Partnerships: Schools, Museums, Nature, Along with Science Centers, Scientists, and MITS  
(Grades 3–12)  
Science Focus: GEN, NGSS  
Sandra Ryack-Bell (sryackbell@mits.org), MITS, Inc. (Museum Institute for Teaching Science), Quincy, Mass.  
Robert Rocha (@rockybob65; trocha@whalingmuseum.org), New Bedford Whaling Museum, New Bedford, Mass.  
Rachel Stronach (rstronach@lloydcenter.org), Lloyd Center for the Environment, Dartmouth, Mass.  
Ronald St. Amand (rstamand@charter.net), Springfield (Mass.) Public Schools  
Join teachers participating in collaborative programs with MITS’ partner organizations to explore inquiry investigations using NGSS science and engineering design practices and learn how to develop partnerships.

Family Science Night: Involving Community Stakeholders  
(Grades 6–College)  
Science Focus: INF, NGSS  
Elana Jacobs, Illinois Institute of Technology, Chicago  
Family science nights are creative ways to involve all community stakeholders in the science learning process. Lesson plans and activities provided.

Analyzing and Interpreting Data: A 3-D Look at the Practice  
(Grades K–12)  
Science Focus: GEN, NGSS  
Walter Woolbaugh (walter@montana.com), Manhattan (Mont.) School District #3  
The practice of analyzing and interpreting data will be explored through a three-dimensional lens in this interactive workshop focused on teachers’ conceptual understanding.

Augmented Science  
(Grades 3–College)  
Center Ballroom, Renaissance  
Science Focus: ETS2, CCC2, CCC3, SEP2, SEP3, SEP4, SEP5, SEP6, SEP7, SEP8  
Matthew Cushing (mpc3@rice.edu), Rice University, Houston, Tex.  
Find out how to use augmented reality in your science classroom to engage all learners and create an active learning environment. Explore multiple augmented reality apps and learn how to create your own augmented reality triggers using Aurasma.
9:30–11:00 AM  Presentation  
Teacher Researcher Day Session: Integrating Instruction to Meet Student Needs  
(General)  
East Ballroom, Renaissance  
Science Focus: GEN, NGSS  
Deborah Roberts-Harris (drober02@unm.edu) and Kathryn Watkins (watkins@unm.edu), The University of New Mexico, Albuquerque  
Discussion centers on the benefits and challenges of providing equitable integrated science education from multiple perspectives. Come with an open mind, and possible questions for the panel.

9:30–11:00 AM  Hands-On Workshop  
NSTA Aerospace Share-a-Thon  
(General)  
Davidson C, Music City Center  
Science Focus: ESS  
Coordinated by members of the NSTA Aerospace Programs Advisory Board  
Dave Garner (dgarnet@usit.net), The University of Tennessee, Knoxville  
From airplanes to asteroids—join teachers and representatives from industry and organizations to discover innovative ways to connect students to STEM through aerospace! Drawing for two one-year NSTA memberships (must be present to win).
Saturday, 9:30–11:30 AM

**9:30–11:30 AM  Presentation**

AMSE Session: George W. Carver Conversations Series on Diversity and Equity (Grades K–12)  
Broadway J, Omni  
Science Focus: ETS, LS, SEP1, SEP3  
Cherry Brewton (cbrewton@georgiasouthern.edu), Science Education Consultant, Statesboro, Ga.  
Join George Washington Carver as “he” steps up to the podium to expound on his life story in the context of science and equity. Conversation follows and NGSS lesson ideas will be shared!

**10:00–10:30 AM  Presentations**

Easy Ways to Modify Existing Lessons to Deepen Student Understanding (Grades 7–12)  
Acoustic, Omni  
Science Focus: GEN, NGSS  
Robbie Higdon (rhigdon72@yahoo.com), James Madison University, Harrisonburg, Va.  
Stephanie Green (sgreen@anderson2.k12.sc.us), Belton-Honea Path High School, Honea Path, S.C.  
Observe several approaches we have used to transform favorite labs, lessons, and instructional activities to support the guiding principles of the CCSS and NGSS.

**Professional Learning Communities for Science Leaders**

(General)  
Fisk One, Renaissance  
Science Focus: GEN  
Holly Sullivan (@lex1science; hsullivan@lexington1.net), Lexington County School District One, Lexington, S.C.  
Elizabeth Boland (eboland@lexrich5.org), Lexington Richland School District Five, Irmo, S.C.  
Find out how a professional learning community can help science leaders help each other support science instruction.

**Weight and See**

(General)  
Music City Ballroom, Renaissance  
Science Focus: GEN, NGSS  
Grace Glanton, The University of Mississippi, University, Miss.  
Discover an innovative lesson that incorporates the three dimensions of the NGSS, even for our youngest learners.

**10:00–11:30 AM  Exhibitor Workshops**

Modeling Earth, Sun, and Other Stars with Bring Science Alive! (Grades K–8)  
107A, Music City Center  
Science Focus: ESS  
Sponsor: Teachers Curriculum Institute  
**Presenter to be announced**  
Experience learning from a student’s perspective as you learn about the relationship between Earth, Sun, and other stars using a powerful online learning system. The lesson was entirely built on the NGSS.

**The Expanding Universe**

(Grade 9)  
107B, Music City Center  
Science Focus: ESS  
Sponsor: Perimeter Institute for Theoretical Physics  
Kevin Donkers and Stephanie Keating, Perimeter Institute for Theoretical Physics, Waterloo, Ont., Canada  
Use simple hands-on activities to help students better understand the expansion of our universe.

**Stretch Your Legs for Science!**

(Grades K–12)  
108, Music City Center  
Science Focus: ESS3, LS2, LS3, LS4, CCC1, CCC6  
Sponsor: Celestron  
Jennifer Fee (birdsleuth@cornell.edu), The Cornell Lab of Ornithology, Ithaca, N.Y.  
Join us for some pre-lunch exercise—explore Nashville via a bird walk! After a tutorial on bird identification, we’ll head outside with Celestron binoculars to experience firsthand how you can meet standards and engage students through bird-watching! After the walk, Celestron will raffle binoculars to a few lucky attendees.

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

(Grades 7–12)  
110A, Music City Center  
Science Focus: ESS  
Sponsor: Microsoft  
Helen Gooch (v-hegooc@microsoft.com), Microsoft Innovative Educator Fellow, Clarksville, Tenn.  
Come learn about a project-based lesson that can create student understanding of environmental science and challenge students to take action to make a difference in their community. Through research and analysis, students create and present a proposal for a solution to the environmental hazard impacting their community.
McDowell Farm School: Integrating Best Practices in a Scientific Garden
(Grades 2–College) 110B, Music City Center
Science Focus: INF
Sponsor: McDowell Farm School
Maggie Johnston (maggie@campmcdowell.com), McDowell Educational Programs, Nauvoo, Ala.
Ali Papp (ali@campmcdowell.com), McDowell Farm School, Nauvoo, Ala.
Connect students to Earth, the food they eat, and their ability to impact the future of agriculture through STEM-based investigations in the garden. Activities focus on creating interdisciplinary garden programs where students can get outside, practice scientific inquiry and design, and explore sustainable systems for the future.

The Truth Behind Brain-Based Learning
(Grades 6–College) 201B, Music City Center
Science Focus: GEN
Sponsor: Society for Neuroscience
Alissa Ortman, Society for Neuroscience, Washington, D.C.
Janet Zadina, Tulane University School of Medicine, New Orleans, La.
There are numerous myths about the brain, and many of them relate to education and how the brain learns. In this workshop, challenge your beliefs and discover the truth behind some of the most commonly held brain-based learning myths.

3-2-1 Blast Off!
(Grades 2–8) 202A, Music City Center
Science Focus: PS2, PS3, CCC2, CCC5, CCC7, SEP1, SEP3, SEP4
Sponsor: Educational Innovations, Inc.
Tami O’Connor, Educational Innovations, Inc., Bethel, Conn.
Join us for a workshop brimming with things that go Bump! (and Zoom! and Boing!) We’ll dazzle you with dynamic demos to help you teach Newton’s laws. Explore energy with hands-on materials that can ignite your students’ curiosity and spark their desire to learn more. Giveaways and door prizes!

Earth and Space Sciences for NGSS: A New Program
(Grades 9–12) 202B, Music City Center
Science Focus: ESS
Sponsor: BIOZONE International Ltd.
Richard Allan (richard@biozone.co.nz), BIOZONE International Ltd., Hamilton, New Zealand
Find the tools you need to successfully implement the high school Earth and space science component of the NGSS program with BIOZONE’s newest student workbook. This carefully constructed resource is strongly focused on student inquiry and written from first principles to address all aspects of the NGSS system architecture. Attendees receive a free sample packet that supports the NGSS.

No Great Science Student (NGSS) Left Behind with NexGen Inquiry™
(General) 202C, Music City Center
Science Focus: GEN, NGSS
Sponsor: Van Andel Education Institute Science Academy
Jim Nicolette (nexgeninquiry@vai.org) and William Dinkelmann, Van Andel Education Institute Science Academy, Grand Rapids, Mich.
Learn how NexGen Inquiry’s affordable, intuitive, and powerful software supports your curriculum and three-dimensional learning called for in the NGSS. Built by teachers for teachers, our web-based platform supports implementation of a research-based instructional model. Drawings for free subscriptions included. Bring your device, create your account, and get started.

Implementing 3D Printing Across the K–12 Curriculum
(Grades K–12) 204, Music City Center
Science Focus: GEN, SEP
Sponsor: Stratasys
Ryan Erickson, District 196, Eagan, Minn.
3D printing is all the rage. Come see how one district’s K–12 approach to 3D printing is leading to greater student engagement, success, and college/career readiness. By implementing a scaffolded plan using 3D printer hardware and software, your students can experience—hands on—the excitement that comes with this technology.
Saturday, 10:00–11:30 AM

Waves
(Grades 6–8) 205C, Music City Center
Science Focus: PS4.B
Sponsor: LAB-AIDS®, Inc.
Mark Koker, LAB-AIDS, Inc., Ronkonkoma, N.Y.
Although we live an EM waves–enabled lifestyle, most of us have no idea how they work. Join LAB-AIDS for a new middle level NGSS-based waves activity from SEPUP’s Issues and Physical Science program. Explore light properties by investigating colors of the visible spectrum and their energy levels using phosphorescent material. Activities exemplify the NGSS and show how SEPUP embeds the research-based practices and real issues to deliver powerful content learning.

Collisions™: Reconceptualizing Chemistry Through Gameplay
(Grades 9–12) 206 A/B, Music City Center
Science Focus: PS
Sponsor: PlayMada Games
Jude Julien, Bronx High School for Writing and Communication Arts, Bronx, N.Y.
Joseph Vincente, East Side Community High School, New York, N.Y.
Edward Wang (edwardw@playmadagames.com), PlayMada Games, New York, N.Y.
Experience a new digital game designed to teach fundamental chemistry ideas in a fun, exploratory, and engaging way. See how Gameplay gives high school students deepened, enduring understandings of key concepts in the system of chemistry. Hear chemistry teachers share their experiences using the game in their classrooms.

Grant Writing: Pipelines, Partnerships, and Finding Funding
(General) 207A, Music City Center
Science Focus: GEN
Sponsor: Ward’s Science
Rusti Berent, Ward’s Science, West Henrietta, N.Y.
Explore proven strategies for finding science funding at the local, regional, state, and national levels. Learn how to implement in your planning process to secure the materials your students need to succeed. Leave this workshop armed with easy-to-implement tools, techniques, and resources to win funding.

Using Fables to Scaffold Inquiry-Based STEM Instruction and the Engineering Design Process
(Grades K–12) 207B, Music City Center
Science Focus: ETS1
Sponsor: Advancement Courses
Amanda Bickerstaff (amanda.bickerstaff@advancement-courses.com), Advancement Courses, New York, N.Y.
In this hands-on PD workshop, learn how to use the Three Little Pigs and other fables as a framework to have STEM instruction meet the NGSS and CCSS, develop authentic tasks and assessments, and integrate the engineering design process along with the four levels of inquiry.

Inquiry-Based Chemistry with Vernier
(Grades 9–College) 207C, Music City Center
Science Focus: PS, SEP
Sponsor: Vernier Software & Technology
Jack Randall (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
Involving your students in inquiry-based chemistry can be easy and fun. Many investigations have already been designed and tested in our lab book, Investigating Chemistry through Inquiry. In this engaging hands-on workshop, conduct an inquiry-based chemistry investigation using Vernier sensors with a LabQuest 2 or Logger Pro computer software.

Elementary Science with Vernier
(Grades 3–6) 207D, Music City Center
Science Focus: GEN, SEP
Sponsor: Vernier Software & Technology
David Carter (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
Learn how to incorporate Vernier sensors and data loggers into your elementary classroom. In this engaging hands-on STEM workshop, you will conduct an activity from our award-winning Elementary Science with Vernier lab manual that promotes student understanding of science, mathematics, and technology using an integrated teaching approach.

NGSS in the High School Biology Classroom
(Grades 9–College) 208A, Music City Center
Science Focus: LS1, PS1, PS2, PS3, SEP
Sponsor: Bio-Rad Laboratories
Kirk Brown, San Joaquin County Office of Education, Stockton, Calif.
Engage with Kirk Brown, a lead writer of the revised California science framework, to understand how to apply the three dimensions from the NGSS in your biology classroom. Gain practical insights and develop strategies to integrate
NGSS into your classroom. This interactive learning opportunity includes modeling, explanation, argumentation, and engineering practices.

**National Geographic Educator Certification Program**
(Grades P–12) 208B, Music City Center
Science Focus: GEN
Sponsor: National Geographic
Alison Szopinski (aszopinski@ngs.org), National Geographic Education, Washington, D.C.
Join us to learn about and help shape National Geographics’s new Educator Certification Program. Complete Phase 1 of the process—learning about our new Learning Framework, which covers the skills and knowledge that teach kids about the world, empowering them to succeed and make it a better place. Also hear about how to undertake Phase 2 and Phase 3 of the certification process and, upon completion, be among the first Nat Geo Certified Educators in the nation.

**Enhance Your AP Chemistry Course with POGIL™ Activities**
(Grades 9–12) 209A, Music City Center
Science Focus: PS
Sponsor: Flinn Scientific, Inc.
Jillian Saddler, Flinn Scientific, Inc., Batavia, Ill.
Process-Oriented Guided Inquiry Learning (POGIL) activities guide students to construct new understandings while simultaneously developing key process skills, including critical thinking, problem solving, and collaboration. The new POGIL Activities for AP Chemistry manual includes 30 activities aligned with the College Board’s recently revised AP chemistry curriculum.

---

**Conference App**

Download our conference app for a social experience you don’t want to miss.

- Search sessions, exhibitors, and speakers to build a schedule of your favorites
- Access maps with pinpoint locations
- Take notes within app
- Bookmark an interesting speaker
- Share the play-by-play with social media channels
- Tweet a memorable quote from a session
- Access conference FAQs

Available for download on

- iPhone + iPad
- Android

Powered by: NSTA National Science Teachers Association
Life Cycle of Stars—From Birth to Catastrophic Death
(Grades 6–12) 209B, Music City Center
Science Focus: ESS1.A
Sponsor: Simulation Curriculum Corp.
Herb Koller, Simulation Curriculum Corp., Minnetonka, Minn.
Where do stars come from? What happens during their life cycle? Why must a star die? Where are stellar graveyards? Join us as we answer these and other questions using Simulation Curriculum’s award-winning Starry Night lessons and learn how to access a free classroom-ready lesson.

The REAL Story of the Animal Kingdom on Planet Earth
(Grades 5–8) 209C, Music City Center
Science Focus: LS
Sponsor: Shape of Life
Nancy Burnett, Shape of Life, Carmel Valley, Calif.
Denise Ryan, Ryan+Forest.Hayes, Soquel, Calif.
Learn from a founder of the Monterey Bay Aquarium how sharing the greatest story every told on planet Earth—the evolution of the animal kingdom—through classroom media, can captivate students. Please join Nancy Burnett as she shares her experience and exquisite short videos, readings, illustrations, and amazing free resources for your classroom. All Shape of Life short videos are derived from the popular PBS series produced by the Shape of Life team. CCSS and NGSS resources available for all attendees.

Engaging Your Students Through the U.S. Fish & Wildlife Service’s Conservation Connect
(Grades 3–8) 210, Music City Center
Science Focus: INF, LS1, LS2
Sponsor: U.S. Fish & Wildlife Service (FWS)
Randy Robinson and Maria Parisi, U.S. Fish & Wildlife Service, Falls Church, Va.
Learn the benefits and opportunities our free Conservation Connect video series offers you, in classrooms and in other settings. FWS’ new web-based series connects students with conservation careers, wildlife species, and the technology we use to protect those species. Try out, discuss, and leave with educational resources aligned with the Next Generation Science Standards and Common Core State Standards, in English language arts and mathematics.

Make Science Come to Life
(Grades 1–5) 211, Music City Center
Science Focus: GEN, NGSS
Sponsor: LEGO Education
Laura Jackson, Anderson (S.C.) School District Five
Did you know LEGO® bricks can provide an engaging platform for making science come to life? Using LEGO Education solutions, elementary students can explore, create, and share discoveries as they build solutions to real-world, standards-based projects and deeply engage with science practices and the engineering design process. Come experience a resource that develops students’ confidence to ask questions, find answers, and solve problems by putting discovery in their hands.

A Peek Behind the Curtain: Disney Parks Approach to Physics and Energy
(Grades 6–12) 212, Music City Center
Science Focus: ETS, PS
Sponsor: Disney Youth Programs
Joseph Cardello, Disney Parks Education Facilitator, Anaheim, Calif.
Join us for a peek into how Disney conducts in-park field trips that teach kids how Disney uses mechanical physics and elements, such as light and sound, to create world-class attractions and entertain guests from around the world.

Let’s Get Helical
(Grades 8–College) 214, Music City Center
Sponsor: MSOE Center for BioMolecular Modeling
Margaret Franzen (franzen@msoe.edu) and Gina Vogt (vogt@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.
DNA can be viewed as a macromolecule or a source of genetic information. Explore both features with interactive DNA models and a paper bioinformatics exercise focusing on the beta subunit of hemoglobin. Examine the mutation that leads to sickle cell disease and the regulation of fetal and adult hemoglobin expression.
10:15–10:45 AM Presentations
Meet Me in the Middle Session: What the NGSS Mean to a Middle Level Teacher—Thoughts from a Member of the Writing Team
(Grades 5–8) Broadway B, Omni
Science Focus: GEN, NGSS
Kenneth Huff (kenneth.huff@roadrunner.com), NSTA Director, Middle Level, and Williamsville (N.Y.) Central School District
Join a member of the NGSS writing team to learn how these standards impact a middle level classroom.

Meet Me in the Middle Session: Roundtable Discussions for Middle School Educators, Part 1
(Grades 5–9) Broadway E/F, Omni
Science Focus: GEN, NGSS
Todd Hoover (DrToddHoover; thoove2@bloomu.edu), Bloomsburg University of Pennsylvania, Bloomsburg
Diana Cost (dcost@gkcps.org), NMLSTA President, and Global Learning Charter Public School, New Bedford, Mass.
Mary Lou Lipscomb (mllsscience@aol.com), National Middle Level Science Teachers Association, Naperville, Ill.
Patty McGinnis (pattymcinnis@gmail.com), Arcola Intermediate School, Eagleville, Pa.
Lisa Brosnick (lbrosnick@gmail.com), North Collins Central School, North Collins, N.Y.
Nealyn Dunlop, Roosevelt Middle School, New Bedford, Mass.
Matthew Hartman, eCYBERMISSION Content Manager and Cheryl Long (clong@nsta.org), eCYBERMISSION Outreach Specialist, NSTA, Arlington, Va.
Jill Lewis (jill.lewis@vwr.com), Ward’s Science, West Henrietta, N.Y.
Tom Loschiavo, PASCO scientific, Roseville, Calif.
Wendy Peel (wpeel@si.com) and Donald Tunstall (dunstall@ti.com), Texas Instruments, Dallas
Jaclyn Stallard, Project Learning Tree, Washington, D.C.
Join middle school teachers for roundtable discussions featuring topics related to the NGSS, science literacy, and more!

10:15–10:45 AM Hands-On Workshops
Meet Me in the Middle Session: Everyday Engineering
(Grades 5–9) Broadway C, Omni
Science Focus: ETS
Richard Moyer, University of Michigan—Dearborn
Engage in STEM activities related to everyday engineering (sweet spots on ball bats or how a plastic baggie seals) and learn how to integrate the four STEM disciplines into one lesson.

Meet Me in the Middle Session: Use Science to Support and Develop ELL Language Acquisition
(Grades 5–9) Broadway D, Omni
Science Focus: GEN
Melissa Sleeper (onewhosleeps3@aol.com), Gifford Middle School, Vero Beach, Fla.
The NGSS supports science learning for all students. We will focus on English language learners and the language support and discourse strategies that engage all students regardless of their English proficiency. Activities will be geared toward developing a classroom culture that ensures that all student voices are included and respected. Take home engaging lessons.

10:30 AM–12:30 PM Meeting
Association of Multicultural Science Education General Membership Meeting
Broadway K, Omni
For details, please visit www.amsek16.org.

10:45–11:45 AM Exhibitor Workshop
Climate Change Series II: Bringing Climate Change Closer to Home: U.S. Forest Service Climate Change Education Resources
(Grades 6–12) 201A, Music City Center
Science Focus: ESS3
Sponsor: NOAA Ocean Service
Amtchat Edwards (mkedwards@fs.fed.us), U.S. Forest Service, Washington, D.C.
Explore Forest Service climate change education resources. Collect and enter tree data to quantify and value services trees provide. Use computer modeling to visualize potential effects to birds and trees through varying emissions scenarios. Bring climate change closer to home; helping to answer, “What does climate change mean to me?”
Meet Me in the Middle Session: Roundtable Discussion—Awards, Recognition, and Competitions for Middle School Educators
(Grades 5–9) Broadway B, Omni
Science Focus: GEN
Diana Wiig (dwiig@uwyo.edu), University of Wyoming, Laramie
Acacia McKenna, Director, Competitions, NSTA, Arlington Va.
The NSTA Awards and Recognition committee, along with the Science Education Competitions, will present a roundtable discussion on the awards and competitions for middle school teachers.

Meet Me in the Middle Session: Science and Special Education—How to Make It Work
(Grades 5–9) Broadway D, Omni
Science Focus: GEN, NGSS
Kathleen Brooks, Retired Educator/Educational Consultant, Westbrook, Conn.
Suggestions are offered for science teachers to work with special education teachers who are weak in science content...for the benefit of all students.

Spoiling Everything They Love: The Truth Behind Pizza and Other Foods
(Grades 6–12) Cumberland 5, Omni
Science Focus: GEN, SEP1, SEP6, SEP8
William Bowman (wbowman@pkwy.k12.mo.us), Parkway North High School, Saint Louis, Mo.
Monica Bowman (@MBowmanScience; mbowman@ladueschools.net), Ladue Horton Watkins High School, Saint Louis, Mo.
Learn how to use food items that many students are familiar with to discuss the interrelationships between the history, ecology, geology, chemistry, and biology of this food.

Community Stakeholders: Banding Together to Leverage Green Schools
(Grades K–12) Fisk Two, Renaissance
Science Focus: GEN, NGSS
Laurel Kohl (kohl1@easternct.edu), The Institute for Sustainable Energy, Willimantic, Conn.
Connecticut’s Green LEAF Schools model—NGSS/CCSS skills supported by a network of state agency programs and informal education providers—has turned our schools and school yards into learning laboratories. Come find out how.
**11:00–11:30 AM  Hands-On Workshop**  
Meet Me in the Middle Session: More Engineering to the Standards  
(Grades 5–8)  
Broadway C, Omni  
Science Focus: ESS, ETS, SEP6  
Susan German, Hallsville Middle School, Hallsville, Mo.  
Come for more lessons related to NGSS engineering performance expectations. Lessons will be shared via electronic means and limited hands-on activity demonstrated.

**11:00 AM–12 Noon  American Geophysical Union (AGU) Lecture**  
Curiosity’s Adventures in Gale Crater, Mars  
(General)  
Grand Ballroom C2, Music City Center  
Science Focus: ESS  
Linda Kah (lkkah@utk.edu), Kenneth G. Walker Associate Professor, Carbonate Sedimentology and Geochemistry, Dept. of Earth and Planetary Sciences, The University of Tennessee, Knoxville  
Mars is an enigma. Despite evidence from the Viking orbiters of a landscape dissected by channels, the Viking landers revealed the surface of Mars to be a desolate place, shaped primarily by wind rather than water. More recent data from the MER rovers has defined a world still dominated by wind, but a world in which water occurred both within the subsurface, and at least episodically, upon the land surface. With Curiosity’s investigation of Gale crater, currently pressing onward toward Mount Sharp, we continue to glimpse a land with a far more complex history of water than first imagined.

Linda C. Kah is a Kenneth G. Walker associate professor in the Carbonate Sedimentology and Geochemistry Department of Earth and Planetary Sciences at The University of Tennessee. She has been pursuing her love of science since kindergarten, when she announced her intention to become a geologist.  
In her research, Linda combines her knowledge of geology, isotope geochemistry, and biology to decipher how ecosystems arise on planets, and how biological processes fundamentally interact with, and even change, geological systems. Her research has taken her to some of the most remote places on Earth, including the Canadian Arctic, Saharan West Africa, and the high Andes of Argentina; and continues to take her to even more remote localities as she explores Gale Crater with NASA’s Mars Science Laboratory mission.

**11:00 AM–12 Noon  Presentations**  
NSTA Press® Session: Diving into the NGSS Disciplinary Core Ideas: How and Why They Are Important for Teaching and Learning  
(Grades K–12)  
101D, Music City Center  
Science Focus: GEN, NGSS  
Ann Rivet (@arivet6; rivet@tc.columbia.edu), Teachers College, Columbia University, New York, N.Y.  
Ravit Golan Duncan (ravit.duncan@gse.rutgers.edu), Rutgers Graduate School of Education, New Brunswick, N.J.  
Joseph Krajcik (krajcik@msu.edu), CREATE for STEM Institute, Michigan State University, East Lansing  
Book editors discuss the disciplinary core ideas across physical, life, Earth and space sciences, and engineering through rich descriptions of phenomena, learning progressions, and teaching resources.

**11:00 AM–12 Noon  Presentations**  
Making STEAM Rise in Your School  
(Grades 4–8)  
103B, Music City Center  
Science Focus: ETS, INF  
Natalie Coleman (@afterthepeanut; ncoleman@joliet86.org), Joliet (Ill.) Public Schools District 86  
Find out how one school district went from two after-school STEM programs to more than 30 with the help of community and educational institutions.

**11:00 AM–12 Noon  Presentations**  
Ten NGSS Talking Points: How to Talk About the Next Generation Science Standards in Your School and Community  
(Grades K–12)  
104A, Music City Center  
Science Focus: GEN, NGSS  
Cindy Workosky (cindy_w@nsta.org), Communications Specialist, NSTA, Arlington, Va.  
Talking about educational standards is an expected task of teachers and administrators. It’s an opportunity to help parents and others know what teachers will be teaching and what students will be learning. Join me and learn more about the goals of the NGSS and get 10 tips for how you can talk about them in your school and community.
Sensing Science: Temperature and Heat Readiness for Early Elementary Students

(Grades K–2) 104B, Music City Center
Science Focus: PS1, PS3, CCC5, SEP1, SEP2
Carolyn Staudt (cstaudt@concord.org), The Concord Consortium, Concord, Mass.

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

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

(Grades 1–8) Davidson A2/3, Music City Center
Science Focus: ESS, INF
Renard Harris (harrisr@cofc.edu), Cynthia Hall (hallcr@cofc.edu), and Willie McCray (mccraywc@g.cofc.edu), College of Charleston, S.C.
Hear how we used Teaching And Learning with Engaging Stories (TALES) as a strategy to enhance socio-economically disadvantaged students’ learning in an after-school program. We will share our collaborative process of creating engaging content-based oral stories that weave Earth and space science concepts.

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

(Grades 9–12) Broadway A, Omni
Science Focus: PS, CCC, SEP
Julie Lockhart, Energy Institute High School, Houston, Tex.
A team of two chemistry teachers who have embarked on the journey of Project-Based Learning relate their successes, best practices, and planning resources.

Earthquakes—From Paper to ArcGIS

(Grades 9–12) 101 A/B, Music City Center
Science Focus: ESS2.B, ESS3.B, CCC1, CCC2, CCC3, SEP2, SEP4, SEP7, SEP8
Mary Shane (shanem@interact.ccsd.net), Advanced Technologies Academy, Las Vegas, Nev.
Let’s take a cookbook lab and infuse it with multiple layers of technology, even having it meet the NGSS.

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

(General) Cumberland 1, Omni
Science Focus: INF
Keri Randolph, Public Education Foundation, Chattanooga, Tenn.
I’ll share lessons learned over four years of supporting and cultivating community partnerships with public schools to support STEM education.

Science for All: Including Diverse Learners

(General) Cumberland 2, Omni
Science Focus: GEN
Vicki Massey, Higley Unified School District #60, Gilbert, Ariz.
Emphasis will be placed on leaders in science facilitating professional development relating to helping diverse learners become scientifically literate.

INF Academic Language: More Vocabulary Strategies to Enhance Engagement and Learning

(Grades 6–12) Cumberland 3, Omni
Science Focus: GEN
Lauren Rentfro (rentfrla@lewisu.edu), Tiffany Albers-Lopez (tiffanyalberslope@lewisu.edu), and Christopher Blogg (cjblogg44@comcast.net), Lewis University, Romeoville, Ill.
This activity-based presentation shares more than 30 vocabulary games and strategies to enhance student learning and the use of academic vocabulary in the science classroom.

INF Brain Science: Resources for the Classroom

(Grades 6–College) Cumberland 4, Omni
Robert Steiner (rsteiner@amnh.org) and David Randle (drandle@amnh.org), American Museum of Natural History, New York, NY
Robert Payo (robert.payo@dmns.org), Denver Museum of Nature & Science, Denver, Colo.
Tammy Cook-Endres (tcook-endres@exploratorium.edu) and Hillary Osheroff (hosheroff@exploratorium.edu), Exploratorium, San Francisco, Calif.
Exceptional brain science resources from the American Museum of Natural History, the Denver Museum of Nature and Science, and the Exploratorium will be presented.
Debatable Demos  
(Grades 5–10)  
Electric, Omni  
Science Focus: PS1, PS2, SEP1, SEP3, SEP4, SEP7  
Richard Frazier  
(richard_frazier@hotmail.com), American Embassy School–New Delhi, India  
Hear about a variety of debatable demonstrations. Challenges to these demos offer rich opportunities for investigation consistent with the spirit of the NGSS.

NSELA Session: Tools for Science Leaders  
(General)  
Legends A, Omni  
Science Focus: GEN, NGSS  
Elizabeth Mulkerrin  
(@nselasscience; elizabeth@omahazoo.com), NSELA President, and Omaha’s Henry Doorly Zoo and Aquarium, Omaha, Neb.  
Presider: Kenn Heydrick, The University of Texas at Tyler  
Come learn about the various tools and strategies that science leaders can use to enhance teaching and learning in their outreach.

Before and After Retirement—Practicalities and Possibilities  
(General)  
Mockingbird 2, Omni  
Science Focus: GEN  
Teshia Birts  
(@TeshiaBirts; tbirts@nsta.org), Senior Director of Membership Development and Chapter Relations, NSTA, Arlington, Va.  
Linda Smith, Retired Educator, Elmer, N.J.  
The NSTA Retired Advisory Board invites you to a vibrant and useful information-sharing session. Join your fellow colleagues and share your ideas about staying active both in and out of the profession.

NSTA Nashville National Conference on Science Education  
Saturday, 11:00 AM–12 Noon  

IRIS EARTHQUAKE Resources  
At NSTA Booth #1327  
www.iris.edu/hq/NSTA  

Teach About Earthquakes  
Access and Explore Earthquake Data  
> Seismic data from recent and historic quakes  
> Lessons and demonstrations  
> Animations and videos  
> Software  
> Much more...

FREE EDUCATIONAL RESOURCES

Saturday, 11:00 AM–12 Noon
ACT’s National Curriculum Survey: Insights About Science Curricula on a National Scale
(General) Mockingbird 4, Omni
Science Focus: GEN, NGSS
Robert Hamilton (brian.hamilton@act.org), Stephanie Stratton, and Jay Thomas (jay.thomas@act.org), ACT, Inc., Iowa City, Iowa
Review results of ACT’s unique comprehensive survey of K–12 and postsecondary educators and hear how the results relate to the Next Generation Science Standards.

HS Engineering 4.0: Going from One Engineering Class to an Articulated Four-Year Science/CVTE Engineering Program
(Grades 9–12) Music Row 1, Omni
Science Focus: ETS, SEP
Amy Winston (amy_winston@newton.k12.ma.us), Newton North High School, Newton, Mass.
Find out about our homegrown curriculum, program expansion and articulation, and engineering-infused science classes. Develop your own “next steps” for expanding (or starting) engineering offerings at home.

Reviewers Needed for NSTA’s Journals
(General) Music Row 2, Omni
Science Focus: GEN, NGSS
Ken Roberts, Assistant Executive Director, Journals, NSTA, Arlington, Va.
Meet with editors to learn how you can join a manuscript review panel for one of NSTA’s award-winning journals.

Nuts and Bolts of Science Program Leadership at the District Level
(Grades K–12) Music Row 3, Omni
Science Focus: GEN
Kelly Price-Colley (@kpriceca; kellyprice@comcast.net), NSTA Director, Coordination and Supervision of Science Teaching, and Forsyth County Schools, Cumming, Ga.
You have been promoted to the role of district science leader. Congratulations! Now what do you tackle first? Learn from the seasoned experts on the NSTA Coordination and Supervision of Science Committee.

Designing a Districtwide K–12 Science Program
(General) Music Row 5, Omni
Science Focus: GEN, INF, NGSS
Caleb Cheung (caleb.cheung@ousd.k12.ca.us), Oakland (Calif.) Unified School District
Come hear the story of science in Oakland, California. Learn how to design, organize, resource, nurture, and implement a districtwide science program that meets the NGSS.

Teacher Researcher Day Session: Project-Based Learning as a Tool for Success
(Grades 6–College) East Ballroom/Group 1, Renaissance
Science Focus: GEN, NGSS
Let’s cover how to use Project-Based Learning to promote student success within traditional upper-level history, math, and science within middle school and high school settings.

Teacher Researcher Day Session: Exploring Geoscience Methods: An InTeGrate Module for Preservice Secondary Science Teachers
(Grades 9–College) East Ballroom/Group 2, Renaissance
Science Focus: ESS3.D, CCC1, CCC4, SEP2, SEP7
Jeff Thomas (thomasjed@ccsu.edu), Central Connecticut State University, New Britain
This three-part module aims to improve preservice science teachers’ understanding of the methods of geoscience by engaging them in an intensive, inquiry-based climate change activity.

Teacher Researcher Day Session: Claims and Evidence: Developing Scientific Argumentation for ELL, IEP, GT, and General Education Middle School Students
(Grades 6–8) East Ballroom/Group 4, Renaissance
Science Focus: GEN, SEP7
Kathy Kennedy (@kkkennedy7; kkennedy3@stevens.edu), Stevens Institute of Technology, Hoboken, N.J.
Caitlin Folkes (caitfolkes@gmail.com), Frelinghuysen Middle School, Morristown, N.J.
Explore best practices learned from an action research project that examines outcomes of varied strategies for developing student argumentation skills in middle school science.

All About Those Bass-ic Materials in Science
(Grades K–12) Fisk One, Renaissance
Science Focus: GEN
Ashley Lagas (@MissLagas; lagasa@holliston.k12.ma.us), Robert H. Adams Middle School, Holliston, Mass.
Rebekah Fuerst (@Fuerstscience; rebekah.fuerst@ucps.k12.nc.us), Parkwood Middle School, Monroe, N.C.
Buy less, learn more! Engage in hands-on activities that you can immediately use in your classroom. CHEETOS®, cookies, pretzels, Pop-Tarts®...the fun is just beginning!
Transforming Teaching into Three-Dimensional Learning  
(Grades 4–12)  
West Ballroom, Renaissance  
Science Focus: GEN, NGSS  
Jan Douglas (@JanKWDouglas; jan.douglas@pccsk12.com), Plymouth-Canton Community Schools, Plymouth, Mich.  
Jan Coratti (jan.coratti@pccsk12.com), East Middle School, Plymouth, Mich.  
Barbara Johnson (dbazjohn@comcast.net), Pioneer Middle School, Plymouth, Mich.  
Deb Stephens (deborah.stephens@pccsk12.com), Central Middle School, Canton, Mich.  
A team of middle school department chairs will describe how to engage all students in the three-dimensional learning of the NGSS by using collaborative whiteboards.

11:00 AM–12 Noon  Hands-On Workshops  
NSTA Press® Session: Bringing Outdoor Science In  
(Grades K–8)  
101C, Music City Center  
Science Focus: LS, CCC  
Steve Rich (@bflyguy; bflywriter@comcast.net), University of West Georgia, Carrollton  
Explore STEM in the school yard with NSTA Press books, and find out how birds and students can “engineer” with sticks and stems. Free seeds!

Your Kids Can, Too! Scientific Argumentation for All Students  
(Grades 5–10)  
101E, Music City Center  
Science Focus: LS1.B, CCC1, SEP3, SEP4, SEP6, SEP7  
Deena Gould (deena.gould@asu.edu), Arizona State University, Tempe  
Come participate in exploration, meaning-making, and argumentation about core concepts in life sciences. Experience strategies, resources, and real examples for success with English language learners, as well as all learners.

Revamping Our Best Earthquake Lessons with Argument-Driven Inquiry to Better Target the NGSS  
(Grades 6–12)  
103A, Music City Center  
Science Focus: ESS2.B, CCC4, SEP7  
Michael Hubenthal, IRIS, Washington, D.C.  
We have adapted several great earthquake-related lessons using argument-driven inquiry to make these lessons really shake (and enhance their NGSS three-dimensional learning)!

Come Fly with Us!  
(Grades 4–7)  
103C, Music City Center  
Science Focus: ETS1, PS2.A, CCC2  
Karen Umeda (karen_umeda@notes.k12.hi.us), Hawaii State Dept. of Education, Pearl City  
Garrett Arakawa (garrett_arakawa@notes.k12.hi.us) and Annette Tanaka (tanakaanet@hawaii.rr.com), Momilani Elementary School, Pearl City, Hawaii  
Join us as we share how a STEM program might be built at your school. Explore a STEM unit that addresses the NGSS performance expectations and integrates history and English language arts. Engage in an engineering challenge that applies the forces of flight!

Supporting English Language Learners in STEM Education Through Engagement in Engineering  
(Grades K–5)  
104C, Music City Center  
Science Focus: ETS  
Nicole O’Neil (@cie_org; noneil@mos.org), Museum of Science, Boston, Mass.  
Emphasis will be placed on supporting English language learners in elementary classrooms. Come engage in background building around a science concept connected with a hands-on engineering activity.
Reframing Classic Elementary Science Lessons with the NGSS
(Grades K–5)  104D, Music City Center
Science Focus: GEN, NGSS
David Kleiner (dkleiner@cliftonschools.net), School 13, Clifton, N.J.
Teachers—are you overstressed and underwhelmed by the NGSS and CCSS? Deepen and broaden “old school” labs by applying the new standards. We will revisit some familiar elementary lessons, reworking them through the lens of the science and engineering practices and crosscutting concepts, and offer suggestions to help you build on what you have always done, rather than start from scratch with the NGSS.

NSTA Press® Session: Learn Strategies to Help You Implement the NGSS Practices!
(General)  104E, Music City Center
Science Focus: GEN, SEP
Susan Koba (skoba@cox.net), Science Education Consultant, Omaha, Neb.
Use instructional tools that help provide students with multiple opportunities to learn, promote linguistic and nonlinguistic approaches to teaching, and support NGSS practices. Handouts!

Let’s Get Physical—From Force and Friction to Water and Weather
(Grades P–3)  105A, Music City Center
Science Focus: PS
Ruth Ruud (ruudruth61@gmail.com), Cleveland State University, Cleveland, Ohio
Juliana Texley (jtexley@att.net), NSTA Retiring President, and Science Writer/Instructor, Boca Raton, Fla.
Don’t look now, but the CCSS asks that you teach physical sciences as early as kindergarten, and the NGSS have very specific goals for early primary. No more procrastinating! The good news is that you have your equipment. Come get easy activities, lit basics, and basic teacher background so that you can start right away!

How to Assess Three-Dimensional Learning in Your Classroom: Building Tasks That Work
(Grades K–8)  105B, Music City Center
Science Focus: GEN, NGSS
Katie Van Horne (@dizzvh; katie.vanhorne@colorado.edu) and William Penuel (@bpenuel; LearnDBIR; william.penuel@colorado.edu), University of Colorado Boulder
Philip Bell (@philipbell; pbell@uw.edu), University of Washington, Seattle
Analyze assessment tasks, discuss strengths of these tasks, and explore how they can be improved to better elicit 3D science learning.

The 6th Mass Extinction: Student Inquiry-Based Lessons on the Decline of Earth’s Biodiversity
(Grades 9–12)  106B, Music City Center
Amber Willis (asb9616@lausd.net), Downtown Magnets High School, Los Angeles, Calif.
This workshop guides teachers through two units to teach the NGSS and CCSS evolution and ecology requirements. Students explore mass extinctions of the past and compare with the current decline in biodiversity.

Ocean Plastic Pollution: Examining Issues and Solutions in a Middle School Classroom
(Grades 6–8)  106C, Music City Center
Science Focus: ESS3.C, PS1.A, CCC6, SEP1
Mary Whaley (mwhaley@mbayaq.org), Monterey Bay Aquarium, Monterey, Calif.
Enrich your classroom with NGSS-focused activities on issues and solutions surrounding plastic pollution. Activities will highlight the physical and chemical properties of plastics, including density and buoyancy. Door prizes!

Using STEM to Fight the Zombies!
(Grades 7–12)  Legends B, Omni
Science Focus: GEN
Jeffrey Lukens, Sioux Falls (S.Dak.) School District
Use the popularity of zombies to make STEM become “un-dead” in your science classroom! Make sure to bring your brains to this hands-on session.
#askNSTA

How can I find funds to attend an NSTA conference?

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

What does NSTA have for student teachers?

What are the Next Generation Science Standards?

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

Come by booth #934 in the Exhibit Hall and ASK US ANYTHING!
Free Online Software for Visualizing Data Across Multiple Disciplines
(Grades 6–College) Legends C, Omni
Science Focus: GEN, SEP4, SEP5, SEP7
William Finzer (wfinzer@me.com), The Concord Consortium, Emeryville, Calif.
Experience data visualization activities from multiple disciplines using free online software from the NSF-supported Common Online Data Analysis Platform (CODAP) project at Concord Consortium. Bring your own laptop!

BSCS Pathway Session: Designing Effective Professional Development for the Next Generation Science Standards
(Grades P–12) Legends D, Omni
Science Focus: GEN, NGSS
Paul Numedahl, BSCS, Colorado Springs, Colo.
What professional development experiences will help teachers understand the three-dimensional aspects of the NGSS and the ways they impact teaching? How can these changes be systemic and sustainable? This session will introduce a model for planning effective science professional development experiences focused on the NGSS and explore the questions that district leaders, teacher leaders, and PD providers need to ask before the PD begins.

Designing Design: A New Model for 21st-Century Teaching
(Grades 3–12) Legends E, Omni
Science Focus: ETS, SEP1, SEP2, SEP6, SEP8
Leah Hirsch (@Leah_B_Hirsch) and Kate Selkirk, Quest to Learn, New York, N.Y.
Complete a hands-on design challenge and explore how to use the design process to promote a classroom culture of innovation, collaboration, and critical thinking.

Science Can Flow Like Poetry!
(Grades 4–10) Legends F, Omni
Science Focus: GEN, NGSS
Emily Millwood (emily.millwood@dcs.edu) and Jenny Letson (jenny.letson@dcs.edu), Oak Park Middle School, Decatur, Ala.
Carolyn Pistorius (pistorc@uah.edu), The University of Alabama in Huntsville
Check out how we teach poetry through science, as well as other forms of scientific literacy! We will do an inquiry-based hands-on lesson and weave writing and art through it.

Shifting Your Lessons to Target NGSS Science and Engineering Practices Using the NextGen ASET Rubrics
(Grades K–12) Legends G, Omni
Science Focus: GEN, SEP
Corinne Lardy (corinne.lardy@csueastbay.edu), Michele Korb (michele.korb@csueastbay.edu), Rachelle DiStefano (rachelle.distefano@csueastbay.edu), and Danika LeDuc (danika.leduc@csueastbay.edu), California State University, East Bay, Hayward
Learn how to unpack, target, and apply specific elements of the NGSS science and engineering practices to your current curriculum using the NextGen ASET rubrics.

Academic Discussions That Promote Science Talk
(Grades 5–College) Center Ballroom, Renaissance
Science Focus: ESS3, SEP8
Kelsey Voller (@missvoller; kelsey.voller@gmail.com), Pacific Heights Academy, Sabin, Minn.
Learn the key components of academic discussions that can support students in building and refining their ability to think, speak, and argue like a scientist.
11:15 AM–12 Noon  Presentation
Fly with Banning!
(Grades 4–8)  Broadway H, Omni
Science Focus: ETS2
Pat Smith (patsmithba@yahoo.com), Greatest Stories Never Told, Broken Arrow, Okla.
Louisa Jaggar (louisajag@aol.com), Greatest Stories Never Told, Bethesda, Md.
James Herman Banning’s life story will be a catalyst to teach the science of flight plus math, technology, and humanities in your classroom.

11:30 AM–12 Noon  Presentations
Teacher Researcher Day Session: Physical Science Understanding in the Young Learner
(Grades P–2)  East Ballroom/Group 3, Renaissance
Science Focus: PS
Mary Hobbs (maryhobbs@utexas.edu), The University of Texas at Austin
Researchers discuss outcomes and implications of NSF-funded research looking at what four-year-olds know and can do in the physical sciences.

Think Science—Taking It to the Streets
(General)  Fisk Two, Renaissance
Science Focus: INF, NGSS
Donna Casanova (@dcasanova77; donna.casanova@ppsd.org), Providence (R.I.) Public Schools
To call out what the NGSS truly inspires us to do requires the interdisciplinary coordination of community partners.
We will share examples of how the school district of Providence, Rhode Island, is making this shift tailored to each individual school.

Using Social Media to Enhance Science Class
(Grades 4–College)  Music City Ballroom, Renaissance
Science Focus: GEN
Marielle Venturino (@msventurino; mari.venturino@gmail.com) and Alicia Johal (@ALICIAJOHAL; aliciajohal@gmail.com), Mar Vista Academy, San Diego, Calif.
Use social media to enhance your science class by connecting students with outside resources both at home and at school.
See how two teachers seamlessly integrate social media into the school day, and use it to bring science home.

12 Noon–12:30 PM  Presentation
Teacher Researcher Day Session: Leading from the Classroom: Science Inquiry Group Network
(General)  East Ballroom, Renaissance
Science Focus: GEN, NGSS
Deborah Roberts-Harris (drober02@unm.edu), The University of New Mexico, Albuquerque
The Science Inquiry Group Network provides a way for interested teachers and teacher educators to continue talking with one another via the internet in between Teacher Researcher Days. Come engage in discussing ways to support teachers interested in inquiring into their own teaching practices and student learning.

12 Noon–1:30 PM  Exhibitor Workshops
Spicing Up Classical Physics Using Modern Examples
(Grades 11–12)  107B, Music City Center
Science Focus: PS
Sponsor: Perimeter Institute for Theoretical Physics
Glenn Wagner and Damian Pope, Perimeter Institute for Theoretical Physics, Waterlo, Ont., Canada
Come see how modern physics can be explored within the classical curriculum with these easy-to-adapt examples for your classroom.

Learning Through Hands-On Activities
(Grades 7–College)  201B, Music City Center
Science Focus: GEN, CCC, SEP1, SEP3
Sponsor: Nano-Link: Center for Nanotechnology Education
Billie Copley (billie@nano-link.org) and Deb Newberry (deb.newberry@dxtc.edu), Nano-Link, Rosemount, Minn.
Nano-Link has created a series of topic-specific nanoscience modules that are centered around hands-on activities. Join in for some fun as you learn the nanoscience behind these very simple and easy-to-do experiments.
Saturday, 12 Noon–1:30 PM

**Sparking Interest with Chemistry**  
(Grades 9–12)  
202B, Music City Center  
Science Focus: PS  
Sponsor: Houghton Mifflin Harcourt  
Jerry Sarquis, Miami University, Oxford, Ohio  
A. Mickey Sarquis, Professor Emeritus, Miami University—Middletown, Ohio  
Join Mickey and Jerry Sarquis, the authors of *Modern Chemistry* and leaders in chemistry education, for this presentation of hands-on chemistry activities. This interactive workshop will feature classroom activities that you can use to spark your students’ interest in chemistry! Learn new tips and tricks using readily available and inexpensive materials. Take home free materials!

**Let Motion Show How Cars May Really Drive Themselves in the Future with the ERGOBOT!**  
(Grades 9–12)  
207A, Music City Center  
Science Focus: PS  
Sponsor: Ward’s Science  
Samantha Bonelli, VWR Science Education, Rochester, N.Y.  
Drive new learning in your classroom by teaching motion physics with robots. Using concepts such as position, velocity, acceleration, and vectors, we will explain how to use interactive simulations and animated interactive equations in order to program a small robot vehicle to complete a closed speed course—and eventually navigate a maze.

**Biology with Vernier**  
(Grades 9—College)  
207C, Music City Center  
Science Focus: LS, SEP  
Sponsor: Vernier Software & Technology  
Colleen McDaniel (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.  
Use Vernier sensors to conduct a variety of biology experiments from our popular lab books in this engaging hands-on workshop. Collect and analyze data using LabQuest 2 and Logger Pro computer software. Explore the wide range of tools that promote understanding of physics concepts.

**Physics with Vernier**  
(Grades 9—College)  
207D, Music City Center  
Science Focus: PS, SEP  
Sponsor: Vernier Software & Technology  
David Carter (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.  
Use Vernier sensors to conduct a variety of physics experiments from our popular lab books in this engaging hands-on workshop. Collect and analyze data using LabQuest 2 and Logger Pro computer software. Explore the wide range of tools that promote understanding of physics concepts.

**From “Science Is for Others” to “Science Is for Me”—Hands-On Modules to Engage All Students**  
(Grades P—5)  
208B, Music City Center  
Science Focus: ETS  
Sponsor: ETA hand2mind  
Johannes Strobel, University of Missouri, Columbia  
Science/engineering carry strong stereotypes. Join us as we synthesize existing stereotypes and show how the strategies of hands-on integrated STEM can help address stereotypes and engage ALL your students.

**Hands-On Integrated Science Activities for Middle School from Flinn Scientific**  
(Grades 6—8)  
209A, Music City Center  
Science Focus: ESS, LS, PS  
Sponsor: Flinn Scientific, Inc.  
Janet Hoekenga, Flinn Scientific, Inc., Batavia, Ill.  
Hands-on science leads to minds-on learning! Flinn Scientific presents relevant and age-appropriate activities for middle school—integrating life, Earth, and physical science topics. Workshop participants perform and observe experiments designed to capture the curiosity and engage the energy of adolescent students. Handouts for all activities.

**SAE Middle School Educational Offerings**  
(Grades 6—9)  
209C, Music City Center  
Science Focus: GEN, SEP  
Sponsor: SAE International—A World In Motion Program  
Come see project-based STEM educational offerings from SAE—from the award-winning A World in Motion program with fuel cell, glider, and motorized toy challenges to Formula One™ with our Schools Technology Challenge, the world’s largest STEM competition.

**Citizen Science—From Classroom to Field with the U.S. Fish and Wildlife Service**  
(Grades 3–12)  
210, Music City Center  
Science Focus: GEN, INF  
Sponsor: U.S. Fish & Wildlife Service (FWS)  
Maria Parisi, Randy Robinson, and Tracy McCleaf, U.S. Fish & Wildlife Service, Falls Church, Va.  
Learn best practices for using citizen science to connect learning with real-world problem solving. We’ll share examples demonstrating how FWS partners with schools and others to engage students as scientists while introducing them
to careers. Join the dialog about applying these best practices in your setting. Leave knowing how to connect with FWS and access our educational resources.

**Make Science Come to Life**  
(Grades 1–5)  
*211, Music City Center*  
Science Focus: GEN, NGSS  
Sponsor: LEGO Education  
Laura Jackson, Anderson (S.C.) School District Five  
Did you know LEGO® bricks can provide an engaging platform for making science come to life? Using LEGO Education solutions, elementary students can explore, create, and share discoveries as they build solutions to real-world, standards-based projects and deeply engage with science practices and the engineering design process. Come experience a resource that develops students’ confidence to ask questions, find answers, and solve problems by putting discovery in their hands.

**Constructing and Crossing Cell Membranes**  
(Grades 5–College)  
*214, Music City Center*  
Sponsor: 3D Molecular Designs  
Gina Vogt (vogt@msoe.edu) and Margaret Franzen (franzen@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.  
Hook biology and chemistry students with models that demonstrate the chemical and physical properties of water and the membranes that separate cells from the surrounding environment. Use hands-on teaching tools to explore diffusion, osmosis, and the transmembrane proteins that facilitate the transport of polar molecules across the cell membrane.

---

Visit us at Booth #808

**New!**  
**Take Your Classroom to the Next Level**  
Our Trapezoid and VersaCurve Series provide secure storage along with interactivity at a push of a button.
12:15–1:15 PM  Exhibitor Workshop
Climate Change Series III: ClimateChangeLIVE: Engage Your Students in Learning and Being Part of the Climate Solution!
(Grades 6–12) 201A, Music City Center
Science Focus: ESS3
Sponsor: NOAA Ocean Service
Amchat Edwards (mekedwards@fs.fed.us), U.S. Forest Service, Washington, D.C.
Discover an online treasure chest of climate change education resources to help you educate, inspire, and engage your students! Compiled are resources from 27 federal agencies and NGO partners, which include lesson plans, videos, webinars, and more. Youth from across the country provide examples of how their classes are part of the climate solution!

12:30–1:00 PM  Presentations
3D Warm the Water to Save Your City: An Engineering and Educational Technology NGSS Student Assessment Task
(Grades 5–9) 103A, Music City Center
Joel Donna, 3Ring, Shakopee, Minn.
Find out how you can assess middle school students’ three-dimensional learning of thermal energy transfer using a hands-on technology-enhanced student assessment task.

Empowering Our Students to Be Citizen Scientists!
(Grades P–12) 103B, Music City Center
Science Focus: GEN, CCC1, CCC7, SEP3, SEP4, SEP8
Susan Koppendrayer (@teachspacemn; skdrayer@calvin-christian.org), Calvin Christian School, Edina, Minn.
Hear how citizen science provides students with an established outlet for real science practice and application that meets the NGSS.

Conceptually Concrete
(Grades 9–12) Acoustic, Omni
Science Focus: GEN
Teresa Ware (@twware60; twware@tupeloschools.com) and Monica Rowe (@monicadyerowe; mdowe@tupeloschools.com), Tupelo High School, Tupelo, Miss.
Join two biology and chemistry teachers as they share how they make the abstract concrete in their diverse classrooms using an array of learning styles.

Meet Me in the Middle Session: Formative Assessment in the Classroom
(Grades 6–8) Broadway A, Omni
Science Focus: GEN
Julie Pepperman, Heritage Middle School, Maryville, Tenn.
Get introduced to and be able to practice some formative assessment techniques that can help inform instructional practice and identify individual student needs.

Meet Me in the Middle Session: Know the “Dirty Dozen” for a Safer Lab Experience!
(Grades 5–8) Broadway B, Omni
Science Focus: GEN, NGSS
Kenneth Roy (@drroysafersci; royk@glastonburyus.org), Glastonbury (Conn.) Public Schools
For a safer teaching/learning experience and a way to keep the middle school teacher out of legal entanglement, learn about the “Dirty Dozen” lab hazards!

Global Collaboration in the Science Classroom
(Grades K–12) Cumberland 1, Omni
Science Focus: GEN, SEP1, SEP7, SEP8
Jacqueline Fernandez, LAYC Career Academy, Washington, D.C.
Find out how to find, establish, and maintain a collaboration with a science classroom on the other side of the world!
STEM for All
(Grades 9–12) Cumberland 3, Omni
Science Focus: GEN, SEP
Sarah Eales (sarah_eales@gwinnett.k12.ga.us) and Hyunjin Son (hyunjin_son@gwinnett.k12.ga.us), Peachtree Ridge High School, Suwanee, Ga.
Opening up a STEM program to a wide variety of students can be challenging. Come see how to integrate engineering, literacy, and real-life applications.

Eradicate Point Grubbing
(Grades 7–College) Cumberland 4, Omni
Science Focus: GEN
Timothy Goodwin (@TimGoodwinEdD; tgoodwin@bemidjistate.edu), Bemidji State University, Bemidji, Minn.
Hear how to grade students in a way that encourages academic risk-taking, provides richer engagement, and reduces cheating.

Gender Equitable Teaching Strategies for Engaging Girls in Engineering and Technology Pathways
(Grades 6–12) Cumberland 5, Omni
Science Focus: ETS, SEP1, SEP3, SEP6
Rita Karl (@SciGirls; rkarl@tpt.org) and Sarah Carter (scarter@tpt.org), Twin Cities Public Television, St. Paul, Minn.
Want to inspire more girls to consider technical and engineering pathways? Find out how to use research-based gender equity strategies to spark a girl’s future!

Standards-Based Grading Strategies and Solutions
(Grades 6–College) Electric, Omni
Science Focus: GEN
Elizabeth Savage (@savageaggiesci; esavage@bcahs.com) and Craig Johnson (@aggiescience; cjohnson@bcahs.com), Bristol County Agricultural High School, Dighton, Mass.
Our whole science department has been using standards-based grading (SBG) for two years within a school with a traditional grading system. Come learn the strategies that have worked for us in our classrooms and how we integrated SBG into our school.

Chemical Action-Based Curriculum
(Grades 8–12) Music Row 1, Omni
Science Focus: ETS1, PS
Matthew Hayes (matt.hayes@grayson.kyschools.us), Grayson County High School, Leitchfield, Ky.
The wonder of science is being able to ask questions and use science to solve problems. Be exposed to a curriculum framework that incorporates a major chemical reaction as a unifying concept for each unit.

Teacher Researcher Day Session: Do Novice Elementary Teachers See Scientists in Their Classroom?
(Grades 1–8) East Ballroom/Group 1, Renaissance
Science Focus: GEN
Kathryn Watkins (watkins@unm.edu), The University of New Mexico, Albuquerque
Novice elementary teachers in a science methods course draw pictures of a scientist and then pictures of their students. What do the pictures tell about their lens as they view their students? We will examine pictures made by novice teachers of both scientists and their students. Discussion centers on perceptions and what can be done to adjust the lens of novice teachers to see their students as prospective scientists.

Teacher Researcher Day Session: What Issues Impact Maximizing Instructional Time When Using a Technology-Centered Curriculum?
(Grades 6–College) East Ballroom/Group 2, Renaissance
Science Focus: GEN
We will take a look at my classroom experience using technology in the science classroom—open for questions and discussion.

Teacher Researcher Day Session: Communicating in Scientific Ways
(General) East Ballroom/Group 4, Renaissance
Science Focus: GEN, NGSS
Deborah Roberts-Harris (drober02@unm.edu), The University of New Mexico, Albuquerque
Let’s discuss ways in which you engage your students in thinking/acting like scientists, and learn about our experiences!
12:30–1:00 PM  Hands-On Workshops

Meet Me in the Middle Session: Citizen Science in YOUR Classroom
(Grades 5–8) Broadway C, Omni
Science Focus: GEN, CCC1, CCC2
Lisa Milenkovic (@sleuthacademy; lisa.milenkovic@browardschools.com), Broward County Public Schools, Fort Lauderdale, Fla.
Leonora Shell (@YourWild_Life; @VeganBugLady; lea_shell@ncsu.edu), North Carolina State University, Raleigh
Experience existing citizen science projects spanning a wide range of topics and activities. Learn how to quickly find and implement peer-reviewed projects appropriate for your classroom. Become a peer-reviewer through our Professional Development for Citizen Science in the Classroom module!

Meet Me in the Middle Session: Engineering Practice in Middle School Chemistry
(Grades 6–8) Broadway D, Omni
Science Focus: ETS1, PS, SEP1, SEP3, SEP6
James Kessler, American Chemical Society, Washington, D.C.
Learn about and try a new engineering design lesson soon to be featured in the free teaching resource www.middleschool-chemistry.com.

12:30–1:30 PM  Presentations

Write to Know Science
(Grades 3–12) 101E, Music City Center
Science Focus: GEN, NGSS
Lee Hughes (leoph@leeschools.net), Lee County Public Education Center, Fort Myers, Fla.
Learn about nonfiction writing prompts that support argumentation, discourse, and inquiry. Writing is a cognitive process wherein students “show what they know.” Prompts are research based and standards focused.

Bloom Where You Are Planted: Growing an Elementary STEM Program
(Grades K–5) 104A, Music City Center
Science Focus: GEN
Andrea Sagely (@OklahomaSTEM; asagely@baschools.org), Broken Arrow (Okla.) Public Schools
Learn how to cultivate successful STEM students at ANY school! Leave with program ideas, sample schedules/lessons, and a renewed inspiration for elementary STEM.

STEM for All: Building a Schoolwide STEM Program
(Grades K–5) 104B, Music City Center
Science Focus: GEN
Ted Komada (tkomada@fusd1.org) and Joe Gutierrez (jgutierrez@fusd1.org), Killip Elementary School, Flagstaff, Ariz.
Experience an overview of the components/processes for developing a schoolwide STEM program/academy.

Designing Classroom Assessments to Address NGSS Performance Expectations
(Grades 5–9) 105B, Music City Center
Science Focus: LS, PS, SEP2, SEP4, SEP7, SEP8
Tracy Bratzke (clownfish39@yahoo.com) and Nicole McRee (mcree.nicole@d46.org), Grayslake Middle School, Grayslake, Ill.
Come learn how to use NGSS performance expectations to design classroom assessments. Sample assessments will be provided that require students to incorporate models and use evidence to support their responses.

DIY: Solar Panels
(Grades 6–12) 106A, Music City Center
Science Focus: ETS2, CCC4, CCC5, CCC7, SEP2
Jessica Minton (mintonj04@gmail.com), Riverdale Elementary School (K–8), Germantown, Tenn.
Think STEM means only Science, Technology, Engineering, and Math? Think again. STEM also means Solar Technology Engaging Minds! Solar panels for the classroom.

Students with Inquiring Minds Are Scientists (SWIMAS): A Study of Elementary Inquiry Science
(Grades K–8) Davidson A2/3, Music City Center
Science Focus: GEN, SEP1, SEP3, SEP4, SEP6, SEP8
Linda Cook, Coppell (Tex.) ISD
Learn about the processes, structures, and supports provided within this model of elementary student-driven inquiry science.
Visit NSTA’s SCIENCE STORE
Exhibit Hall B

Offering the latest resources for science teachers, including new releases and best sellers!

- Fun NSTA-branded gear—unique hats, shirts, mugs, collectible pins, and more
- Everyone enjoys member pricing: 20% off all NSTA Press® titles

Download the conference app or follow #NSTA16 for special giveaways, contests, and more throughout the conference!

Visit www.nsta.org/store to make a purchase today, or call 800-277-5300.
NESTA and CIESIN Share: Exploring a Compendium of Online Resources for Teaching Earth Science  
(Grades 6–College) Davidson B, Music City Center  
Science Focus: ESS  
Michael Passow (michael@earth2class.org), Dwight Morrow High School, Englewood, N.J.  
Margaret Holzer (mholzer@monmouth.com), Chatham High School, Chatham, N.J.  
Carla McAuliffe (carla_mcauliffe@terc.edu), TERC, Cambridge, Mass.  
NESTA members will share exemplary educational websites, including the Center for International Earth Science Information Network, to help implement NGSS and state curricular standards programs.

STEM Educators Award-Winning Share-a-Thon  
(Grades 6–12) Davidson C, Music City Center  
Science Focus: GEN, NGSS  
Jacqueline Fernandez (jackie82002@yahoo.com), LAYC Career Academy, Washington, D.C.  
Branie Freeman (@whsfreeman; brandie.freeman@bartow.k12.ga.us), Woodland High School, Cartersville, Ga.  
Presider: Amanda Upton, Manager, Nominations and Teacher Awards Programs, NSTA, Arlington, Va.  
Come learn about the latest STEM classroom initiatives by the PASCO STEM Educator award winners! Teachers will present their winning ideas at the middle school and high school levels.

School District and Community Engagement in STEM Education on the International Space Station…and Beyond  
(Grades 5–College) Grand Ballroom C2, Music City Center  
Science Focus: GEN, INF, NGSS  
Jeff Goldstein, Arthur C. Clarke Institute for Space Education, Ellicott City, Md.  
Let’s discuss what happens when a community gets their own space program, engaging hundreds of students in experiment design, with one launching to the International Space Station. We’ll also explore what happens when a community is given a model solar system.

Harmonizing Science and Math: Making High School Math Relevant  
(Grades 9–12) Broadway G, Omni  
Science Focus: GEN, SEP4, SEP5  
Scott Reis (scottreis@k12tn.net), Unaka High School, Elizabethton, Tenn.  
Help students gain a deeper and more meaningful understanding of both subjects by adding these integrated STEM activities incorporating high school–level math into your science curriculum.

Dive into Engineering Design: Connecting Physical Science and Engineering Through Underwater Robotics  
(Grades 6–12) Broadway H, Omni  
Science Focus: ETS1, PS  
Arthur Camins, Stevens Institute of Technology, Hoboken, N.J.  
Learn about the potential and challenges of 3-D learning when middle school and high school youth engage in underwater robotics to connect engineering design and physical science.

Research Insights into Online Communities of Practice and Teacher Learning Online: NSTA Learning Center  
(General) Broadway J, Omni  
Science Focus: GEN  
Al Byers (abyers@nsta.org), Associate Executive Director, Services Division, NSTA, Arlington, Va.  
Hear about our latest research insights conducted by the American Institute for Research, North Carolina State University, and Edvantia for NSTA’s e-PD portal.

Meeting the NGSS…Even When You Don’t Have To  
(Grades 6–12) Cumberland 2, Omni  
David Zeiger (dzeiger@trinitychristian.org), Trinity Christian Academy, Addison, Tex.  
What do a Rube Goldberg Project, Pig Autopsy CSI, and a Maple Seed Prototype have in common? Come get our lesson plans and find out!

Being a Unicorn: Preservice Teachers and Their Quest for a Professional Identity  
(College) Mockingbird 2, Omni  
Science Focus: GEN  
Robbie Higdon, James Madison University, Harrisonburg, Va.  
Preservice teachers share their experiences about finding their identity as emerging science educators. Student perspectives about their teacher education programs will be shared.
AMSE Session: Differentiating Instruction to Help All Students Reach Their Fullest Potential  
(Grades P–8)  
Music Row 2, Omni  
Science Focus: ESS2.D

Cherry Brewton (cbrewton@georgiasouthern.edu), Science Education Consultant, Statesboro, Ga.  
Experience lessons designed to differentiate instruction and integrate the three dimensions in the NGSS: science and engineering practices, disciplinary core ideas, and crosscutting concepts.

Problem Solving Through Observation: The Mystery of Three Turning Dots  
(Grades 5–12)  
Fisk Two, Renaissance  
Science Focus: PS2, CCC2

Youngseok Jhun, Seoul National University of Education, Seoul, Republic of Korea  
Hear about an activity based on discovery learning in which students employ observation and analysis to explain a physical phenomenon—velocity addition. Find out what happens when two film containers with colored dots are spinned.

Nuts and Bolts of Science Program Leadership at the School Level  
(Grades K–12)  
Music Row 3, Omni  
Science Focus: GEN

Kelly Price-Colley (@kpricega; kellyrprice@comcast.net), NSTA Director, Coordination and Supervision of Science Teaching, and Forsyth County Schools, Cumming, Ga.  
You have been promoted to the role of science department chair. Congratulations! Now what do you tackle first? Learn from the seasoned experts on the NSTA Coordination and Supervision of Science Committee.

Mindset and the Educational Revolution  
(General)  
Music City Ballroom, Renaissance  
Science Focus: GEN

Ramy Mahmoud, Williams High School, Plano, Tex.  
Tired of consistently increasing apathy in your students every year? Learn how to transform your classroom to produce highly engaged risk takers using the book Mindset!

Science for Everyone! Engaging Science Instruction for Students with Profound Disabilities  
(Grades P–12)  
Fisk One, Renaissance  
Science Focus: GEN

Michele Hodson (vvmhodson@mdeca.org), Valley View Junior High School, Farmersville, Ohio  
Discuss the unique science needs of students with profound disabilities. Leave with materials that can be used as soon as you return to your school!

Three Dimensions, Vertical Alignment, and STEM: Sequential Skill Building for Student Success  
(Grades K–12)  
West Ballroom, Renaissance  

Rabieh Hafza (@drhafza; jamalhafza@att.net), Atlanta (Ga.) Public Schools  
Emphasis will be placed on implementing the NGSS three dimensions and vertical alignment to advance students’ research skills and content knowledge in STEM-related classes.

12:30–1:30 PM  Hands-On Workshops

NASA Aeronautics 101: Over a Century of Flight  
(Grades P–12)  
101 A/B, Music City Center  
Science Focus: ESS, PS

April Lanotte (april.a.lanotte@nasa.gov), NASA Aeronautics Research Mission Directorate, Calhan, Colo.  
Celebrate more than 100 years of flight with NACA/NASA. Hands-on activities from the principles of flight to more complex aerodynamic physics will give everyone something to explore.

Supporting the NGSS and CCSS in Urban Elementary Classrooms  
(Grades K–5)  
101C, Music City Center  
Science Focus: GEN, NGSS

Dean Martin (@drdiscover; dean.bpssscience@gmail.com), Boston (Mass.) Public Schools  
Explore a unique model for supporting schools in an urban system that supports an elementary science specialist in the classroom to improve student achievement.
Lead with Science: Learn How to Use Science Tasks to Reinforce Common Core State Standards, in English Language Arts and Mathematics  
(Grades K–6/College)  
Science Focus: ETS, SEP  
Deborah Black, Kenne State College, Keene, N.H.  
Heather Pelkey (@mrs_pelkey; bahpelkey@comcast.net), Winchester School, Winchester, N.H.  
Learn from K–6 teachers, college faculty, and preservice teachers how to use science tasks to reinforce Common Core State Standards, in English Language Arts and Mathematics. Explore ways to develop authentic interdisciplinary application tasks that rest on the science and engineering practices and draw from other content areas. Solve a complex problem confronting a fictional character from a book using science and engineering.

A Way with Words: Integrating Science, Engineering, and ELA in Elementary Classrooms  
(Grades P–5)  
Science Focus: ETS, CCC, SEP1, SEP2, SEP6, SEP8  
Brian Raygor (@ScienceWCBOE; @BrianJRaygor; braygor@wcboe.org) and Kevin Hill (khill@wcboe.org), Wicomico Country Public Schools, Salisbury, Md.  
Science time getting squeezed by CCSS? In this interactive workshop, you’ll use our tool to find STEM in any storybook and get your students excited about reading AND science. Receive a CD packed with classroom resources.

Universal Design for Learning: A Powerful Way to Teach Electric Currents  
(Grades 4–5)  
Science Focus: PS3.B, CCC5, CCC6, SEP2  
Kelly Gillstrom and Deborah Hanuscin (@DHanuscin; hanuscinl@missouri.edu), University of Missouri, Columbia  
Through participation in a 5E (Engage, Explore, Explain, Elaborate, and Evaluate) learning cycle on electric currents, we’ll show how Universal Design for Learning (UDL) can enhance the participation of all students.

Planting a School Garden on a Shoestring Budget  
(Grades P–5)  
Science Focus: ESS2, LS1.C  
Rebecca Kurson (rkurson@goldaochacademy.org), Golda Och Academy, West Orange, N.J.  
Sprout new learning in your preK–5 classroom. Attention prospective gardeners, come find out how to start a school garden using just newspaper, tin cans, and old soda bottles.

Science Notebooks K–3  
(Grades P–3)  
Science Focus: GEN, NGSS  
Sheri Farmer, 93rd Street Elementary School, Los Angeles, Calif.  
Science notebooking is easy to implement even with our littles! Students will use their notebooks as a learning tool while teachers will find the notebooks helpful with progress monitoring, informal assessment, and content understanding. Come learn ways to implement notebooking in K–3 science classes.

Smart Switches  
(Grades 7–12)  
Science Focus: ETS1, PS3, SEP1, SEP2, SEP3, SEP6  
Jana Sebestik (@MSTEOoffice; sebestik@illinois.edu) and Samantha Lindgren (@MSTEOoffice; salindgr@illinois.edu), University of Illinois at Urbana-Champaign, Champaign  
Use LEDs and copper tape to investigate switches that make decisions. Learn how power outages are minimized. Receive NGSS-focused kits and a classroom-ready activity booklet.

Using Modeling Activities in the High School Chemistry Class  
(Grades 9–College)  
Science Focus: PS, SEP2, SEP6  
Michael Mury, American Chemical Society, Washington, D.C.  
Visualization is difficult for many students. Join me as I discuss and demonstrate several modeling activities you can use in your chemistry class.

Taking Advantage of the Power of Google Drive  
(Grades 4–College)  
Science Focus: GEN, SEP4, SEP5, SEP7, SEP8  
Mary Lightbody (lightbody.1@osu.edu), The Ohio State University at Newark  
Integrate media literacy with science for powerful learning experiences. Learn what Google forms, spreadsheets, and other online tools do to foster science argumentation in your classroom, BYOD.
Quick ‘n Easy GMO Detection: Engage Students with Real-World Biotechnology and Genetics  
(Grades 7–College)  
Legends D, Omni  
Science Focus: LS3, CCC, SEP  
Liss O’Connell (loconnell@dimanregional.org), Diman Regional Vocational Technical High School, Fall River, Mass.  
Whitney Hagins, Massachusetts Biotechnology Education Foundation, Cambridge  
Pamela Baptiste (pbaptiste@gnbvt.edu), Greater New Bedford Regional Vocational Technical High School, New Bedford, Mass.  
Engage in a biotechnology activity to foster evidence-based arguments about GMOs—includes connections to NGSS life science core ideas, crosscutting concepts, and science practices. Virtual and hands-on resources!

Modeling in STEM Education with Examples from Climate Modeling  
(Grades 6–College)  
Legends F, Omni  
Science Focus: ESS2.D, CCC4, CCC5, CCC7, SEP2, SEP5  
Randy Russell, UCAR Center for Science Education, Boulder, Colo.  
Join in for activities for teaching scientific modeling as it relates to various scientific disciplines, with specific examples drawn from climate modeling.

A Practical Guide for Aligning Existing Materials to the NGSS: The EQuIP Rubric  
(Grades 9–College)  
Legends G, Omni  
Science Focus: GEN, NGSS  
Hillary Lauren (@ImpactSciEd) and Barbara Hug (bhug@illinois.edu), University of Illinois at Urbana-Champaign, Champaign  
Developers and teachers: Want to better align your curriculum to the NGSS? Gain experience and advice while evaluating an example lesson from Project NEURON.

---

We love science as much as you.

Online M.A. in Science Education  
When did you fall in love with science? The online M.A. in Science Education at Western Michigan University is designed for any teacher with a passion for science.  
Program highlights:  
• 30 credits  
• Average program completion time is 18 months  
• Same tuition rate for in-state and out-of-state students  
• Offers an array of elective courses  
Learn more about what you love.  
wmich.edu/online/nsta
Using Models to Make All Students’ Thinking Visible and Revisable
(Grades 3–8) Music Row 5, Omni


Claudio Vargas (claudio.vargas@ousd.org) and Sonnie-Dae Ross (sonnie.dae@ousd.k12.ca.us), Oakland (Calif.) Unified School District

Models are explanatory and predictive tools that support understanding of phenomena. Join us for an active exploration of strategies to create, revise, and discuss models.

Exploring Light and Color: Hands-On NGSS-Based Investigations from the Exploratorium
(Grades 3–College) Center Ballroom, Renaissance

Science Focus: ETS1, PS4.A, PS4.B

Eric Muller (emuller@exploratorium.edu), Exploratorium, San Francisco, Calif.

We will cover basic optics, color mixing, and biology of the eye/brain system all with make-and-take, easy-to-do, content-rich “Snack” activities.

1:00–1:30 PM Presentations

Explaining Population Dynamics Through the Modeling of Long-Term Data on Hurricane Disturbance in Puerto Rico
(Grades 6–8) 103A, Music City Center

Science Focus: LS2.A, LS2.C, CCC1, CCC4, CCC7, SEP2, SEP4, SEP7, SEP8

Steven McGee (@lponline_mcegee; mcgee@lponline.net), Northwestern University, Evanston, Ill.

Randi McGee-Tekula, The Learning Partnership, Western Springs, Ill.

What will happen to a tropical rain forest if it is struck by hurricanes more frequently? See a demonstration on using modeling to investigate that question.

Using Career Academies to Develop Community Partnerships in the Classroom
(Grades 9–12) 103B, Music City Center

Science Focus: GEN

Alicia Pressel (alicia.pressel@stjohns.k12.fl.us), St. Johns County School District, St. Augustine, Fla.

The Academy of Environmental and Urban Planning is a STEM academy that teaches students environmental science, technology, and engineering. Students have opportunities to earn industry certifications, gain real-world experience, and have internships through community partnerships.

Promoting Academic Integrity in Your Classroom
(Grades 9–12) Acoustic, Omni

Science Focus: GEN

Stacia Hottle (@SPEHottle; shottle@tampaprep.org), Tampa Preparatory School, Tampa, Fla.

Discussions about academic integrity don’t have to wait for a rule violation. Promoting academic integrity on a regular basis will prepare your students for success.

“Link-ing” to Learn
(Grades K–12) Cumberland 1, Omni

Science Focus: GEN

Jill Weaver (@jillsciteach; jill.weaver@valleystreet.k12.oh.us), Valley View Junior High School, Farmersville, Ohio

Hear how “Link-ed” in for learning allows you to create a network of partners to successfully teach and engage your class in opportunities you never dared to dream possible.

Robotics in the Classroom
(Grades 9–12) Cumberland 3, Omni

Science Focus: ETS

Jennifer Smit, Illinois Institute of Technology, Chicago

Students from a Chicago Public School’s high school participate in a competitive robotics competition each school year. Funded by sponsors, including NASA, Baxter, Google, and 3M, this program creates opportunities for students to access real-world engineering experiences and inspire them to find the value of science, technology, and engineering in society. Find out how to modify the robotics competition for the classroom.

Educating for Ecological Identity
(General) Cumberland 4, Omni

Science Focus: ESS

Timothy Goodwin (@TimGoodwinEdD; tgoodwin@bemidjistate.edu), Bemidji State University, Bemidji, Minn.

It isn’t enough to teach ecology and environmental issues. We also need to help students understand their ecological identity if we are to avert an ecological crisis.
Fish Kill! A Three-Dimensional Learning Unit
(Grades 6–10) Cumberland 5, Omni
Science Focus: LS2.C, CCC1, CCC2, CCC4, CCC5, CCC7, SEP
Marsha Bednarski (bednarskim@ccsu.edu), Central Connecticut State University, New Britain
Begin with a phenomenon, end with an engineering solution! Discover how to integrate the three dimensions to design instruction that supports best practices for learning.

INF The Environmental Science Summer Research Experience for Young Women
(Grades 9–College) Electric, Omni
Science Focus: INF, LS2, SEP
David L. Brock (brockda@rpcs.org), Roland Park Country School, Baltimore, Md.
Hear how to create a summer research internship for increasing high school girls’ interest in pursuing careers in science.

Developing Community College Students’ Research Skills
(College) Mockingbird 4, Omni
Science Focus: GEN, CCC2, SEP1, SEP3, SEP7, SEP8
Amy Naylor (@DrANaylor; anaylor@mitchellcc.edu), Mitchell Community College, Statesville, N.C.
Learning about scientific investigations involves more than defining hypotheses and variables. Engage students in developing experimental protocols, critiquing professional articles, and presenting their own research.

Bringing STEAM and Literacy to the Periodic Table
(Grades 6–10) Music Row 1, Omni
Science Focus: PS, SEP2, SEP8
Lois Nyren (nyren@ramaz.org) and Elizabeth Weissman (weissmane@ramaz.org), The Ramaz School, New York, N.Y.
Discover how an elements project integrates technology, literacy, and arts into the study of atomic structure and the periodic table.

Teacher Researcher Day Session: The Effects of Student Collaboration on Performance in a Grade 9 Biology Class
(Grades 7–12) East Ballroom/Group 1, Renaissance
Science Focus: LS
Cynthia McMillen (@cindymcbuf; cmcmillen@dunkirk.wnyric.org), Dunkirk High School, Dunkirk, N.Y.
Jean Michielli-Pendl (jean.michielli-pendl@fredonia.edu), SUNY Fredonia, N.Y.
Join in a discussion about student collaboration structures and how they impacted achievement in a highly diverse grade 9 biology class.

Teacher Researcher Day Session: Student-Developed Assessment
(Grade 7) East Ballroom/Group 2, Renaissance
Science Focus: GEN
Energize your students by having them design multi-modal performance assessments. Hear lessons learned and student feedback, as well as view samples of student-generated assessments and other data collected.

Teacher Researcher Day Session: How the Search for Bigfoot Can Teach Science and Engineering Practices
(Grades 6–College) East Ballroom/Group 3, Renaissance
Science Focus: GEN, SEP
Cher Carlisle, Mount Juliet High School, Mount Juliet, Tenn.
Students struggle to learn science and engineering practices. Turn your students into Sasquatch hunters. Hear how to use the search for Bigfoot as an open-ended inquiry with accountable talk practices to teach these practices.

1:00–2:30 PM Exhibitor Workshop
Getting to Know the Creative Coding Through Games and Apps (CCGA) Course Content
(Grades 7–10) 110A, Music City Center
Science Focus: GEN
Sponsor: Microsoft
Todd Beard (t-tobear@microsoft.com), Microsoft Innovative Educator Fellow, Detroit, Mich.
This session is an overview of a first-semester course to introduce programming in early secondary grades in a manner that will excite and engage students, no prior experience required! Come gain an understanding of the course through hands-on experience with the curriculum.
1:15–1:45 PM  Presentations
Meet Me in the Middle Session: Earworms and Melodies: Teaching Science Through Songs
(Grades 4–10) Broadway A, Omni
Science Focus: ESS, IS, PS
Donna Governor (dgovernor@windstream.net), NSTA Director, District V, and North Forsyth High School, Cumming, Ga.
Orchestrate new learning with content-rich science songs that engage students through novelty while building conceptual knowledge and activating multiple neural pathways for understanding.

Meet Me in the Middle Session: Science Formative Assessment: What Do Middle School Students Really Think?
(Grades 6–8) Broadway B, Omni
Science Focus: GEN
Joyce Tugel (jtugel@gmail.com), Maine Mathematics and Science Alliance, Augusta
Find out how a variety of formative assessment techniques can be used to promote intellectual engagement and uncover middle school students’ ideas and ways of reasoning.

Meet Me in the Middle Session: Engaging Students in Science with Interactive Notebooks and Nature Journaling
(Grades 7–8) Broadway C, Omni
Science Focus: GEN
Nealy Dunlop, Roosevelt Middle School, New Bedford, Mass.
Come learn how to use interactive notebooks and nature journaling as a means of engaging middle school students in science and increasing scientific writing. Samples will be provided and participants will practice these methods of journaling in an interactive environment.

Meet Me in the Middle Session: Using 5Es to Engage Middle Schoolers
(Grades 6–8) Broadway D, Omni
Science Focus: GEN
Vicki Massey (vickimassey@cox.net), Higley Unified School District #60, Gilbert, Ariz.
Learn how using the 5E (Engage, Explore, Explain, Elaborate, and Evaluate) model of instruction engages middle-schoolers in science while developing critical-thinking skills. This session will reinforce cooperative learning strategies.

1:30–2:30 PM  Exhibitor Workshop
Climate Change Series IV: NOAA Climate Stewards
(Grades K–12) 201A, Music City Center
Science Focus: ESS3
Sponsor: NOAA Ocean Service
Molly Harrison (molly.harrison@noaa.gov), Peg Steffen (peg.steffen@noaa.gov), and Bruce Moravchik (bruce.moravchik@noaa.gov), NOAA National Ocean Service, Silver Spring, Md.
Bringing climate science into education settings can be challenging. Come learn from educators in NOAA’s Climate Stewards who will showcase strategies, activities, and resources to use with your audiences. Information about NOAA Climate Stewards Education Program will also be presented.

2:00–2:30 PM  Presentations
History Should Be Repeated in the Science Classroom
(Grades 6–12) Acoustic, Omni
Science Focus: GEN, SEP1, SEP6, SEP8
William Bowman (wbowman@pkwy.k12.mo.us), Parkway North High School, Saint Louis, Mo.
Monica Bowman (@MBowmanScience; mbowan@ladueschools.net), Ladue Horton Watkins High School, Saint Louis, Mo.
Intertwining history and science makes students better appreciate how historical events impacted the development of science and how science causes historical changes.

Get the Maker Party Started
(Grades K–12) Cumberland 2, Omni
Science Focus: INF
Gina Tesoriero (@stemsucceedsu; ginatesoriero@gmail.com) and Amanda Solarsh (amandasolarsh@gmail.com), Simon Baruch MS104, New York, N.Y.
Encourage creativity and engagement in STEM fields by throwing a Maker Party at your school, inspiring both community involvement and student leadership.
Using STEM Interactives in the Classroom to Connect Learning to Real-World Applications  
(Grades 6–12) Cumberland 3, Omni  
Science Focus: GEN  
**Tracie Mastronicola** (@tracie_mastro; tracie.mastronicola@ck12.org), CK–12 Foundation, Palo Alto, Calif.  
Learn how to integrate science interactives into your classroom and lab. These interactives can help you to connect science concepts to real-world examples.

Recruiting STEM Talent and Designing Pathways for STEM Teaching  
(College) Music Row 3, Omni  
Science Focus: GEN  
**Heather J. Johnson** (heather.j.johnson@vanderbilt.edu) and **Jennifer Ufnar** (jufnar@gmail.com), Vanderbilt University’s Peabody College, Nashville, Tenn.  
Discussion centers on recruitment efforts to attract STEM talent into teaching and the construction of supportive licensure pathways to improve STEM teaching in urban schools.

Teacher Researcher Day Session: Multimedia Portfolios as Assessment  
(General) East Ballroom/Group 2, Renaissance  
Science Focus: GEN, NGSS  
**Deborah Roberts-Harris** (drober02@unm.edu), The University of New Mexico, Albuquerque  
Join me as I share student multimedia portfolios prepared as a final assessment for my science methods course.

2:00–3:00 PM NSTA/ASE Honors Lecture  
The Learning Journey  
(General) 103B, Music City Center  
Science Focus: GEN  
**Corinne Stevenson**, Chairperson, The Association for Science Education, Hatfield, Herts., United Kingdom  
Presider: Shaun Reason, Chief Executive, The Association for Science Education, Hatfield, Herts., United Kingdom  
A clear professional pathway for science teachers supports high-quality teaching and good outcomes for young people. Such a pathway places responsibility for progression with teachers by enabling them to benchmark their skills and expertise, identify what they need to progress, and select appropriate professional development to take them forward in their professional journey. There is an expectation that schools will support teachers in their journeys and enable them to access appropriate professional development. Join Corinne, current chair of the Association for Science Education in the U.K., as she shares how ASE is supporting the development of this journey and linking it to its professional registers.

Corinne Stevenson is currently chair of the Association for Science Education in the U.K. as well as a school improvement consultant. She started her teaching career as a secondary teacher in the London Borough of Hounslow. She eventually became head of School Improvement, responsible for achievement in all schools in the Local Authority. She has also held posts as Ofsted inspector, chair of the Chartered Science Teacher Awarding Board, and previous chair and current secretary of NAIGS (National Advisers and Inspectors Group for Science).
Thoughts on Science Education, Science, and Personal Beliefs

(General) Grand Ballroom C2, Music City Center
Science Focus: GEN

Sponsored by Arthur C. Clarke Institute for Space Education

Jeff Goldstein (@doctorjeff; jeffgoldstein@ncesse.org), Institute Director, Arthur C. Clarke Institute for Space Education, Ellicott City, Md.

Presider: Fred Myers, APAST President, Bolivia, N.C.

Discussion centers on the vital role in the science and STEM classroom of inquiry- and evidence-based conceptual understanding at an emotional level, and its connections to both science and one’s personal beliefs. It is a pedagogy grounded in what it means to be human, and embracing the notion that science and personal beliefs need not be in conflict. Jeff’s goal is a truly thought-provoking experience for all teachers of science and STEM.

Dr. Jeff Goldstein is director of the National Center for Earth and Space Science Education (NCESSE). He is responsible for overseeing the creation and delivery of national science education initiatives with a focus on Earth and space. These include programs for schools, families, and the public; professional development for grades K–12 educators; and exhibitions for museums and science centers. Initiatives are meant to provide a window on the nature of science and the lives of modern-day explorers. Programs are designed to “inspire… then educate.”

As NCESSE director, Dr. Goldstein creates and directs several programs including Student Spaceflight Experiments Program (SSEP), which immerses grades 5–16 students, in 123 communities across the U.S and Canada, in real microgravity experiment design with one experiment selected from each community to launch to the International Space Station and be operated by an astronaut. He also plays a key role in The Voyage National Program, a permanent installation of the Voyage model Solar System on the National Mall in Washington, D.C. In 2016, the Voyage Mark II exhibition will be available for permanent installation at 100+ sites across the U.S. and worldwide. He is also serves as director for The MESSENGER Educator Fellowship Program, supporting NASA’s MESSENGER spacecraft mission to Mercury, provided training for 24,000 K–12 teachers on solar system science through a corps of master science educators, as well as The Family Science Night program at the Smithsonian National Air and Space Museum.

Don’t Open That Textbook Yet, You’ve Got a Story to Share!
(Grades 1–6) 104E, Music City Center
Science Focus: GEN

Adam Devitt (ard386@nyu.edu), New York University, New York, N.Y.

Where and how do you do science? Recognizing and valuing science in our own lives so we can foster meaningful connections to students’ lives.

Investigating the New Madrid Seismic Zone: New Science from Earthscope and Illustrative Physical Models for the Classroom
(Grades 6–College) 105A, Music City Center
Science Focus: ESS2.B, CCC2, SEP6

John Taber (taber@iris.edu), IRIS, Washington, D.C.

Get the latest science on the New Madrid seismic zone and how to investigate the processes causing plate boundary and intraplate quakes with students.

GeoTeach: Engaging Middle School Students in Inquiry and Engineering-Based Earth Science
(Grades 6–8) 106A, Music City Center
Science Focus: ESS, ETS1

Katie Busch (kabusch@uab.edu) and Danielle Yancey (dmyancey@uab.edu), The University of Alabama at Birmingham

We will share innovating and engaging activities that help students and teachers get excited about middle school Earth science. Includes inquiry, engineering, and literacy.
STEM is designing our future and opening doors to strategic thinking and lucrative careers. NSTA has an abundance of STEM resources from award-winning NSTA Press books, virtual conferences, resources in the NSTA Learning Center, journal articles, STEM-specific sessions at our conferences, and a STEM Forum & Expo held this July in Denver, plus much more! Also, on most all of these resources, you can use your member discount on purchases!

www.nsta.org/membership
Inside the Science Teacher’s Studio  
(General) Broadway B, Omni  
Science Focus: GEN, NGSS  
**Linda Jordan** (jordan.linda1212@gmail.com), Council of State Science Supervisors, Nashville, Tenn.  
**Jennifer Dye** (@jendye71_dye; jennifer.dye@jp2hs.org), Pope John Paul II High School, Hendersonville, Tenn.  
**Margie Hawkins** (@margiebg; margiebg@gmail.com), Program Coordinator, NSTA Nashville National Conference, and Winfree Bryant Middle School, Lebanon, Tenn.  
Learn how the TSTA, Oakley STEM Center, and Building Capacity for TN Science Education network have partnered to facilitate a smooth transition into the new Tennessee Science Curriculum Framework way of teaching and learning, with online webcasts and on-site pop-up conferences.

**App and at ’em: Using Technology in Professional Development**  
(Grades K–12) Broadway G, Omni  
Science Focus: ETS2  
**Lisa Bohn** (@lisa_bohn; lbohn@astate.edu), Arkansas State University, Jonesboro  
**Elizabeth Allan** (eallan@uco.edu), University of Central Oklahoma, Edmond  
**Pat Shane** (pshane@unc.edu), 2009–2010 NSTA President, and Educational Consultant, Chapel Hill, N.C.  
Join us as we demonstrate free apps that can be used to enhance the essential elements of successful professional development: preplanning, implementation, and evaluation.

**EXENTHUNCO**  
(Grades 6–8) Broadway H, Omni  
Science Focus: LS4.B  
**Frederick Maier** (fredmaier@sbcglobal.net), Village of Itasca Nature Center, Itasca, Ill.  
Species populations change over time. Take students on a 100-year journey with this program where some species thrive, and some go extinct.

**Building Effective STEM Partnerships on a Limited Budget**  
(Grades K–12) Cumberland 1, Omni  
Science Focus: GEN, NGSS  
**Sandra Jenoure** (jenoure@aol.com), Hunter College, New York, N.Y.  
**Adaliz Gonzalez** (@adalizg310; adaliz@rocketmail.com), New York City (N.Y.) Dept. of Education  
**Roy Harris** (rharris@thecei-pea.org; rharris2@schools.nyc.gov), CEI-PEA, Whitestone, N.Y.  
Join a team of educators and administrators as they share their experiences creating a culture of collaboration and trust in a network of K–12 schools. Learn how they are able to meet regularly, share best teaching practices, share STEM lesson planning focused on the CCSS, and develop online resources. All resources will be available for the participants.

**Freshwater Stewardship: Equip Your Student-Scientists with Cutting-Edge Resources from NOAA**  
(Grades 4–12) Cumberland 4, Omni  
Science Focus: ESS  
**June Teisian** (@jlt.eisian; june.teisian@noaa.gov), NOAA Office of Education, Washington, D.C.  
**Dennis Cain** (dennis.cain@noaa.gov), NOAA National Weather Service, Fort Worth, Tex.  
Floodling. Water Pollution. Freshwater is the lifeblood of our planet, and our future depends on the next generation of environmental stewards to preserve the health of watersheds. NOAA and the National Weather Service have a wealth of online lesson plans, videos, data sets, webinars, and more to help inform and inspire students to action in research, stewardship, and resource management for vital freshwater ecosystems.

**Problem-Based Learning: A Partnership Using NGSS and CCSS**  
(Grades 3–College) Cumberland 5, Omni  
Science Focus: GEN, NGSS  
**Barney Peterson** (bpetersen@everettsd.org), Monroe Elementary School, Everett, Wash.  
**Gary Popiolkowski** (garypoprr33@gmail.com), Chartiers-Houston Junior/Senior High School, Houston, Pa.  
Learn how to use Problem-Based Learning to promote authentic research and problem-solving opportunities for all students. Join us to share ideas, techniques, online resources, and experiences.

**Enhancing Science Understanding Through Conceptual Change Lessons**  
(Grades K–6, College) Electric, Omni  
Science Focus: GEN, NGSS  
**Susan Cooper** (sjcooper@fgcu.edu), Florida Gulf Coast University, Fort Myers  
**Lee Hughes** (leoph@leeschools.net), Lee County Public Education Center, Fort Myers, Fla.  
Examine K–6 lessons and activities focused on conceptual change that help elementary education majors develop scientific literacy and understand the nature of scientific knowledge.
Using Machine Learning to Measure Learning Progressions and Inform Instruction  
(Grades 7–12)  
Music Row 2, Omni  
Jay Thomas, Stephanie Stratton, and Brian Hamilton (brian.hamilton@act.org), and ACT, Inc., Iowa City, Iowa  
See how machine learning algorithms can provide insights from student answers that inform instruction. ACT has partnered with Michigan State’s CarbonTIME project to find out.

Equity in the Science Classroom  
(Grades K–12)  
Music Row 5, Omni  
Science Focus: GEN, NGSS  
Thomas Reinhardt (reinhardt.biology@gmail.com) and Sonnie-Dae Ross (sonnie.dae@ousd.k12.ca.us), Oakland (Calif.) Unified School District  
How is “equitable teaching” the same and different from “good science teaching?” Together, we will examine science teaching and learning through a lens of equity.

Design Thinking: A Creative Engineering Approach to Problem Solving  
(Grades 5–College)  
Fisk Two, Renaissance  
Science Focus: ETS1, ETS2.B, CCC4, SEP1, SEP2, SEP4, SEP6  
Ruth Leonard (@CHEM2T; ruth.leonard@sullivank12.net), Sullivan County Schools, Blountville, Tenn.  
Engage in five-step process Design Thinking. This process can be used with students or coworkers in striving to creatively solve problems.

The Magic of Science! Motivate Your Science Students Using “Discrepant Events”  
(Grades 4–12)  
Music City Ballroom, Renaissance  
Science Focus: GEN  
Dwight “Buzz” Putnam, Whitesboro High School, Marcy, N.Y.  
This session introduces thought-provoking, paradoxical discrepant demonstrations for all science subjects, performed with music and humor, guaranteed to energize your most apathetic science students!

2:00–3:00 PM Hands-On Workshop  
Holy Moly Roly Poly!  
(Grades K–3)  
101 A/B, Music City Center  
Teresa Higgins (teresa.higgins@unco.edu), University of Northern Colorado, Greeley  
School yard organisms provide an easy connection for exploring the outdoors with young learners. Pill bugs are the target of great interest by many kids and there is a lot kids can learn! Come explore the fascinating world of the pill bug with engaging experience and ideas to share with your learners.

Integrating STEM into the Entire Elementary Curriculum  
(Grades 2–5)  
104C, Music City Center  
Science Focus: GEN  
Mandy Colwell (mandy.colwell@gscs.org), Crescent Road Elementary School, Griffin, Ga.  
Discover exciting ways to implement STEM into reading, writing, and social studies, as well as science and mathematics! Learn how LEGO® bricks can inspire and engage students in STEM implementation. Take home the design process, lesson plan template, and lesson plans ready for use in the classroom.

STEM: Not Just Another Thing...  
(Grades K–5)  
104D, Music City Center  
Science Focus: ETS  
Michele Wiehagen (michele.wiehagen@sdhc.k12.fl.us) and Shana Tirado (shana.tirado@sdhc.k12.fl.us), Hillsborough County Public Schools, Tampa, Fla.  
This session will provide K–5 teachers with an hands-on approach to the creation of integrative STEM lessons. Receive lessons samples.
Engaging Chemistry Students Through Forensics Investigations  
(Grades 10–12)  
Science Focus: PS  
Tonya Patterson  (tpatterson@alvinisd.net), Alvin High School, Alvin, Tex.  
Presider: Stephanie Hopkins, Alvin High School, Alvin, Tex.  
We will share ways to increase students’ interest in chemistry by converting traditional lab investigations and activities into an exciting forensic problem-solving opportunity. Engage in hands-on activities using extensive and intensive properties, solubility, intermolecular forces, and explore a different approach to the flame test to support forensic investigation.

Participating in the Global Decomposition Project and Using the IMOLD Interactive Model of Leaf Decomposition  
(Grades 6–12)  
Science Focus: LS  
Susan Steiner  (ssteiner76@hotmail.com), Murphy High School, Murphy, N.C.  
Get hands-on learning using the Global Decomposition Project, and learn to use the virtual model of leaf decomposition: IMOLD.

This Efficient House  
(Grades 6–8)  
Science Focus: ETS1, CCC2, CCC3, CCC5, SEP  
Patricia Hillyer  (@iHillyer; phillyer@gmail.com), Matawan-Aberdeen Middle School, Cliffwood, N.J.  
Design your idea of an energy-efficient home. Learn how to use an interdisciplinary unit of Project-Based Learning incorporating the NGSS and CCSS using real research and materials from home.

National Earth Science Teachers Association (NESTA) Shares: Atmosphere and Ocean Share-a-Thon  
(General)  
Science Focus: ESS  
Michael Passow  (michael@earth2class.org), Dwight Morrow High School, Englewood, N.J.  
Carla McAuliffe  (carla_mcauliffe@terc.edu), TERC, Cambridge, Mass.  
Join more than 20 NESTA members and other educators as they share their favorite weather, climate, and ocean classroom activities. Many free handouts!

Capturing Engineering Design and Process in Youth Portfolios  
(Grades 4–College)  
Science Focus: ETS1, CCC, SEP  
Stephanie Chang  (@heyasteph; stephanie@makered.org) and Lisa Regalla  (@Regallium), Maker Education Initiative, Emeryville, Calif.  
Curious about facilitating the creation of open youth portfolios? Join us for a hands-on workshop that focuses on the capture and documentation of engineering design processes by students.

Nano Days and Nights  
(General)  
Science Focus: ESS2.A, INF, CCC3, CCC6, SEP2, SEP3, SEP4  
Lynne Hehr  (lhehr@uark.edu) and John Hehr, University of Arkansas, Fayetteville  
Want a way to tie today’s research-of-the-future to formal and informal science education? Explore fun, hands-on nanotechnology stations and leave with loads of ideas/resources.

Critical Perspectives on Using News Media in the Science Classroom  
(Grades 7–12)  
Science Focus: GEN  
Michael Bowen  (gmbowen@yahoo.com), NSTA Director, District XVIII, and Mount Saint Vincent University, Halifax, N.S., Canada  
Tony Bartley, Lakehead University, Thunder Bay, Ont., Canada  
Discussion centers on problematic issues with using news media in science classrooms to teach science and then engage in example activities that address these issues.

Science at the Dollar Store  
(Grades 3–College)  
Science Focus: GEN  
Nancy Foote  (@mrsfoote; tinkerbell0611@gmail.com), Sossaman Middle School, Queen Creek, Ariz.  
View demos of lots of hands-on standards-based science labs that you can do with your students with materials from the dollar store! Stop spending so much money! Find out how to get stuff for free!
2:00–3:30 PM  Presentation
Multicultural/Equity Share-a-Thon
(General)  Davidson C, Music City Center
Science Focus: GEN, NGSS
Jerry Valadez (jdvscience@yahoo.com), NSTA Director, Multicultural/Equity, and California State University, Fresno
Paul Adams (padams@fhsu.edu), NSTA Director, District XI, and Fort Hays State University, Hays, Kans.
Deena Gould (deena.gould@asu.edu), Arizona State University, Tempe
S. Maxwell Hines (hinessm@wssu.edu), Winston-Salem State University, Winston-Salem, N.C.
Sami Kahn (samikahn@mail.usf.edu), Collegiate School, New York, N.Y.
Brittnee Laurence (b.laurence@vikes.csuohio.edu) and
Brianna Scimone (bscimone13@gmail.com), Cleveland State University, Cleveland, Ohio
Gary Nakagiri (gnakagiri@gmail.com), Alameda County Office of Education, El Cerrito, Calif.
Vanesa Sherman (vanesa.sherman@cgelem.k12.az.us), Cactus Middle School, Casa Grande, N.Mex.
Come get reenergized and renewed as you visit our numerous exhibits of effective strategies, exemplary programs, and successful practices.

Reimagine the classroom

Apply scientific thinking and modern technologies

Open opportunities for students to think and act like scientists, ask questions and explore new ideas with PASCO wireless solutions.

Are you ready to unleash imagination?

Booth #622

Coming June 2016:
• Wireless Voltage
• Wireless Current
• Wireless Conductivity
• Wireless Light

Wireless Temperature $39
Wireless Pressure $59
Wireless pH $59
Smart Cart $159
Wireless Spectrometer $399
Wireless Force/Acceleration $99
2:00–3:30 PM  Exhibitor Workshops
Wind Turbines and Fruit Batteries! Constructing Engaging Engineering Experiences Using NGSS Performance Expectations
(Grades 3–5)  202B, Music City Center
Science Focus: ETS, CCC, SEP
Sponsor: Houghton Mifflin Harcourt
Michael DiSpezio, Author and STEM Specialist, North Falmouth, Mass.
Here’s your chance to learn the basic teaching tenets of engineering as prescribed by grades 3–5 performance expectations. Learn and have fun as you participate in grade-appropriate activities that profile the NGSS approach to engineering and use inexpensive and easy-to-obtain materials.

Elementary Science Activity Jamboree
(Grades 1–6)  207A, Music City Center
Science Focus: ESS, LS, PS
Sponsor: Ward’s Science
Patty Muscatello, VWR Science Education, Rochester, N.Y.
Come on down and join us for good ol’ fashion integrated science lessons, y’all! Learn how to integrate NGSS science concepts across your elementary curriculum and get your kiddos fired up about science. We will highlight at least one NGSS-focused activity from life, Earth, and physical science disciplinary core ideas. Meet fellow teachers, share new ideas, learn tips and techniques, and more.

Human Physiology with Vernier
(Grades 9–College)  207C, Music City Center
Science Focus: LS, SEP
Sponsor: Vernier Software & Technology
John Melville (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
Use Vernier sensors to conduct a variety of human physiology experiments from our popular Human Physiology with Vernier lab book in this engaging hands-on workshop. Experience data collection using LabQuest 2, Logger Pro computer software, and mobile devices.

Introductory Engineering Design Projects with Vernier
(Grades 6–12)  207D, Music City Center
Science Focus: ETS1, SEP
Sponsor: Vernier Software & Technology
Dave Vernier (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
This engaging hands-on workshop explores ways to use Vernier sensors for introductory engineering design projects. Using our Digital Control Unit and Logger Pro computer software, participants will learn how to apply logic statements to set alarms and to control simple electronic devices based on sensor input values.

ECO Classroom: Free Experiential Learning in the Rain Forests of Costa Rica
(Grades 7–12)  208B, Music City Center
Sponsor: Northrop Grumman Foundation
Ryan Cilsick, Edgewood Junior High School, Merritt Island, Fla.
Samuel Wheeler, Einstein Fellow, U.S. Dept. of Energy, Durham, N.C.
Peggy Lubchenco, K–12 Science Professional Development Consultant and Science Specialist, Goleta, Calif.
Past ECO Classroom teachers will share their experiences from participating in a free professional development program that offers middle school and high school science teachers the opportunity to study rain forests in Costa Rica. Information about the next trip will also be presented.
Make Science Come to Life
(Grades 1–5) 211, Music City Center
Science Focus: GEN, NGSS
Sponsor: LEGO Education
Laura Jackson, Anderson (S.C.) School District Five
Did you know LEGO® bricks can provide an engaging platform for making science come to life? Using LEGO Education solutions, elementary students can explore, create, and share discoveries as they build solutions to real-world, standards-based projects and deeply engage with science practices and the engineering design process. Come experience a resource that develops students’ confidence to ask questions, find answers, and solve problems by putting discovery in their hands.

2:00–4:00 PM Meeting
NSTA Council Round Table
(By Invitation Only) Legends A, Omni

2:00–4:00 PM Presentations
INF Science in the Community Session: Forum on Family Science Learning
(General) 104A, Music City Center
Science Focus: INF, CCC1, CCC2
Kelly Riedinger (kriedinger@davidheil.com), David Heil & Associates, Inc., Portland, Ore.
Marc Wunder (marc.wunder@aps.edu) and Stefanie McDermott (stefanie.mcdermott@aps.edu), Albuquerque (N.Mex.) Public Schools
Allison Brody (abrody@explora.us), Explora, Albuquerque, N.Mex.
Join practitioners and researchers as they share insights from research on family science learning as well as exemplary partnerships and programs that seek to provide families with opportunities to learn science.

Check out these dependable, easy-to-use and affordable timers at booth 741

STOKES PUBLISHING COMPANY
1292 Reamwood Avenue
Sunnyvale, CA 94089
1-800-550-5254
www.stokespublishing.com
Saturday, 2:00–4:00 PM

Meet Me in the Middle Session: Middle Level Share-a-Thon
(Grades 5–9) Broadway E/F, Omni
Science Focus: GEN
Organizer: Todd Hoover (@DrToddHoover; thoove2@bloomu.edu), Bloomsburg University of Pennsylvania, Bloomsburg
Visit bit.ly/1T37EXd for a complete list of participants.

Calling all middle school science teachers! Join more than 100 presenters to obtain numerous lesson plans and activities for use in your classroom tomorrow!

2:00–4:00 PM Hands-On Workshop
Alliance of Affiliates Session: The 3Rs: Research, Resources, and Relationships
(General) Broadway K, Omni
Science Focus: GEN
Juan-Carlos Aguilar (jagular@doe.k12.ga.us), Georgia Dept. of Education, Atlanta
Lisa Martin-Hansen (@LMHROCKS; l.martinhansen@csulb.edu), ASTE President, and California State University, Long Beach
Deborah Hanuscin, (hanuscind@missouri.edu), University of Missouri, Columbia
Come connect with NSTA affiliates to learn about research and resources and form relationships to support your work in science education.

2:30–3:00 PM Presentations
Culturally Relevant Teaching Practices in Science Classrooms
(Grades 6–12) Acoustic, Omni
Science Focus: GEN
Katherine Wade (katieohwade@gmail.com) and Suzanna Roman (suzannaroman@hotmail.com), Georgia State University, Atlanta
Melissa Schoene, Georgia Perimeter College, Decatur
This session is geared toward grades 6–12 science teachers who are interested in using culturally relevant pedagogy as a framework for their curriculum.

The Future of School
(General) Cumberland 2, Omni
Science Focus: GEN
Robert Shaw, Mary Institute and Saint Louis Country Day School, Saint Louis, Mo.
Thinking of building a new science/STEM classroom? Learn how to make the building part of the classroom, leverage open space for environmental projects, and launch innovative programs with a greenhouse, research lab, and robotics lab. Renovate or build from scratch to create STEM spaces that will meet the needs of every learner.

Putting the TECH into TEaCHing
(Grades 7–12) Cumberland 3, Omni
Science Focus: GEN
Julie Heintz (@julieheintz; jheints@tfld15.org) and Susan Lessner (slenner@tfld15.org), Thornton Fractional North High School, Calumet City, Ill.
Integrating technology can be intimidating. Come witness easy ways to integrate technology into a science classroom, with stories of success and failure!

How to Create an Engaging and Successful Online Science Classroom
(College) Music Row 3, Omni
Science Focus: GEN
Andrea Bierema (abierema@msu.edu), Michigan State University, East Lansing
Discussion centers on how to create an effective online science course from an instructor who is an adjunct faculty member at multiple online institutions.
Teacher Researcher Day Session: Using Scientific Literacy as a Reflective Practitioner  
(General) East Ballroom/Group 1, Renaissance  
Science Focus: GEN  
Jeremy Ervin (@drjervin; jervin@cedarville.edu), Cedarville University, Cedarville, Ohio  
Attention will be paid to effective inquiry-based reflection strategies to make sense of science teaching practices and student learning.

Teacher Researcher Day Session: Learning About Motion Is MESSY  
(General) East Ballroom/Group 2, Renaissance  
Science Focus: GEN, SEP  
Deborah Roberts-Harris (drober02@unm.edu), The University of New Mexico, Albuquerque  
MESSY stands for Movement, Engagement, Social Interactions, Spontaneity, Yikes and Yippees. University faculty, teachers, and students participated in a MESSY learning adventure. Integrating STEM areas led students to new learning through the NGSS eight practices of science and engineering.

Teacher Researcher Day Session: The Effect of Scientific Research on High School Students  
(Grades 6–College) East Ballroom/Group 4, Renaissance  
Science Focus: GEN  
Cher Carlisle, Mount Juliet High School, Mount Juliet, Tenn.  
This Tennessee course offers scientific research as a laboratory science. Hear about the success of students taking the class at Mount Juliet High School in Wilson County.

2:45–3:45 PM Exhibitor Workshop  
Climate Change Series V: Use NGSS as a Pathway to Climate Literacy  
(Grades 6–12) 201A, Music City Center  
Science Focus: ESS3  
Sponsor: NOAA Ocean Service  
Frank Niepold (frank.niepold@noaa.gov), NOAA Climate Program Office, Silver Spring, Md.  
The NGSS are the first science standards to include human-caused climate change as a core idea for students. This session will provide examples of how and where climate concepts can be integrated with the NGSS, review climate relevant performance expectations, and discuss NOAA and partners efforts to identify NGSS-focused resources.

3:00–4:30 PM Exhibitor Workshop  
The Differentiated Classroom in One Package: Teaching Science Inquiry to Modern Learners Using Microsoft Surface and Apps  
(Grades 7–12) 110A, Music City Center  
Science Focus: GEN  
Sponsor: Microsoft  
Helen Gooch (v-hegooc@microsoft.com), Microsoft Innovative Educator Fellow, Clarksville, Tenn.  
This session will demonstrate examples of how students and teachers can use digital inking and Microsoft tools to differentiate learning in an inclusive science classroom. We will showcase how students are able to learn the five features of scientific inquiry and be engaged at a much deeper level.

3:00–6:00 PM Meeting  
CESI Board Meeting  
(By Invitation Only) Gibson Boardroom, Omni

3:30–4:00 PM Presentation  
Using Multi-Genre Writing to Infuse NGSS into the Science Classroom  
(Grades 7–College) Fisk One, Renaissance  
Science Focus: GEN, SEP  
Ann Haley Mackenzie (@annmackenzie; mackenah@miamioh.edu), Miami University, Oxford, Ohio  
Discussion focuses on the use of multi-genre literacy projects and how they can be infused into the science classroom to support the NGSS.
3:30–4:30 PM  Featured Presentation

**Bundling the NGSS Performance Expectations**

(General)  
Science Focus: GEN, NGSS

![Peter McLaren](image)

**Peter McLaren** (@PeterJMcLaren; pmclaren@achieve.org), Achieve, Inc., Washington, D.C.

Presider: David L. Evans, NSTA Executive Director, Arlington, Va.

“Bundling” is a term used to describe the process of grouping related NGSS performance expectations to build sequences of instruction to maximize learning for students. Join Peter as he shares the what, why, and how behind the bundling process to promote cohesive instruction to support students’ investigations of phenomena and solving problems.

Peter McLaren is currently director of State and District Support for Science at Achieve, Inc. Before joining Achieve, he was the science and technology specialist for the Rhode Island Department of Education (RIDE) where he supported districts in matters pertaining to standards and policy issues on K–12 science curriculum, instruction, and assessment as well as technology education. From 2010 to 2013, Peter served as president of the Council of State Science Supervisors (CSSS). In addition, he was a member of the National Academy of Science Committee for Developing Assessments of Science Proficiency in K–12 Education and the National Academy of Engineering Committee on Guiding Implementation of K–12 Engineering Education. He has also served as a member of the national writing committee for the Next Generation Science Standards.

Before joining RIDE in 2005, Peter was a science teacher for 13 years at both the high school and middle school levels. His recognitions include the Milken Family Foundation National Educator Award (2001) and the Rhode Island Science Teacher of the Year (1995) by the MIT-sponsored Network of Educators of Science and Technology. He holds a master’s degree in science education from the University of Rhode Island.

---

3:30–4:30 PM Presentation

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

(Grades 9–12)  
Science Focus: GEN, SEP3

**Borislaw Bilash**, Pascauk Valley High School, Hillsdale, N.J.

Students doing inquiry doesn’t just happen on its own. Learn how to help students develop the skills they need to design meaningful experiments that will provide convincing evidence.

---

**Full STEAM Ahead**

(Grades K–6)  
Science Focus: GEN, NGSS

**Amanda Iocoangeli** (iocoangeli@monroe.k12.mi.us), Monroe (Mich.) Public Schools

**Lisa McLaughlin** (mclaugh2@monroe.k12.mi.us), Custer Elementary School, Monroe, Mich.

**Cheryl Bindus** (bindus@monroe.k12.mi.us) and **Kyle Reed** (reedk@monroe.k12.mi.us), Waterloo Elementary School, Monroe, Mich.

Thinking about becoming a STEAM school? Come explore one elementary school’s journey—STEM vs. STEAM, LEGO® Robotics with coding, and curriculum redesign.

---

**Climate Studies with Global Hawk and NASA Airborne Science**

(Grades 6–12)  

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

Use teacher-created lesson plans to collect climate and atmospheric data, and then compare it to the data collected by NASA scientists. Connect with NASA scientists during Airborne Science Missions.

---

**Oh Say, Can You C-E-R?**

(Grades 1–7)  
Science Focus: GEN, CCC2, SEP1, SEP6, SEP7, SEP8

**Molly Murador-Cobb** (@mollyp72; molly.murador@fwisd.org) and **Megan Clawson** (@meclawson; megan.clawson@fwisd.org), Fort Worth (Tex.) ISD

Help the young scientists in your classroom as they use evidence to construct scientific explanations. Join us for practical strategies to implement Claim-Evidence-Reasoning in all grade levels with varied scaffolding to meet the needs of all learners.
BRING AEROSPACE INTO YOUR SPACE

LAUNCH INTO

science, technology, engineering, and math with the National Air and Space Museum’s webcast series, STEM in 30. Each fast-paced, 30 minute episode is broadcast LIVE from the floor of the museum.

STEM in 30 webcasts are perfect for students in the sixth to eighth grades and feature interviews with experts, demonstrations, animations, student experiments, challenges, audience polls, and viewer questions.

A dynamic teaching tool, the STEM in 30 website is designed to allow classrooms to get directly involved with the live broadcast. Viewers can participate online by sending in questions and answering polls, connecting students directly to museum experts from anywhere in the world.

2016 Schedule

April 20  Kites
May 11    Helicopters
May 25    Moon Rocks
June 15   Milestones of Flight: Lunar Module
September 14  Science on the Station
September 28  Star Trek 50th Anniversary
October 19  Hot Air Balloons
November 16  Landing on Other Planets
December 14  Wright Brothers

Smithsonian National Air and Space Museum
Watch online at airandspace.si.edu/stemin30
facebook.com/stemin30 @stemin30
Multi-Level Peer Tutoring Supports Student Success in High School Science  
(Grades 9–12)  
Science Focus: GEN, SEP  
Shannon Morey (shannon.morey@gmail.com), East Boston High School, Boston, Mass.  
Hear about an innovative peer tutoring program at an urban high school in which students in advanced science courses tutor peers in introductory courses.

Bring the Experts (Virtually) into Your Classroom  
(Grades 6–12)  
Science Focus: GEN  
Jeffrey Lukens (jeffreylukens0613@gmail.com), Sioux Falls (S.Dak.) School District  
Don’t be at a loss when trying to answer the question: “When are we going to use this?” Let industry experts answer for you!

Weaving Literacy and Technology into the Middle School Science Classroom  
(Grades 6–8)  
Science Focus: GEN, SEP1, SEP6, SEP7, SEP8  
Janet MacNeil (@curiouslearner8; janet_macneil@brookline.k12.ma.us), Public Schools of Brookline, Mass.  
Learn how to integrate talk, writing, reading, and technology seamlessly into rich science learning experiences, assess students’ understanding, and meet the NGSS and CCSS ELA.

Open and Guided Inquiry in Biology  
(Grades 9–10)  
Science Focus: LS, CCC1, CCC2  
Maggy Witecki (maggywitecki@hotmail.com) and Rick Stanley (rick.stanley@mnps.org), Hume-Fogg Academic High School, Nashville, Tenn.  
Experience one approach (presented by our students) and discuss what works for guided and open inquiry projects in biology. Take away rubrics and other helpful documents to get started!

Differentiating Content, Process, and Product: Examples from Earth History, Ecology, Force and Motion, and Astronomy Units  
(Grades 6–12)  
Susan Gran (sgran@lsc.k12.in.us), Lafayette (Ind.) School Corp.  
Join in for sharing of a collection of activities for successfully encouraging students of all ability levels to engage with life, Earth, and physical science content and process.

But I Can’t Do Science! Changing a Culture of Learned-Helplessness Through Standards-Based Grading  
(Grades 7–12)  
Science Focus: GEN, SEP  
April West (april.west@graves.kyschools.us), Graves County High School, Mayfield, Ky.  
Discover why we transitioned to standards-based grading with tips for secondary implementation and the impact it has had on students’ perceptions about their ability to be successful in science.

Mastery Learning That Provides Choice and Changes Perception  
(Grades 8–12)  
Science Focus: PS1, PS2.B, PS2.C, CCC1, CCC3, CCC4, SEP4, SEP5, SEP6, SEP8  
Erica Peddi (@elpeddi; erica.peddi@cobbk12.org; elpeddi@gmail.com), Campbell High School, Smyrna, Ga.  
Find out how to use mastery learning cycles and how one school changed perception of a “hard” course and increased pass rates by differentiating.

Using Models to Teach How Blood Spatter Tells a Story!  
(Grades 9–College)  
Science Focus: GEN  
Anthony Bertino (abertino@nycap.rr.com) and Patricia Nolan Bertino (nolanp@nycap.rr.com), Retired Educators, Schenectady, N.Y.  
Using easy-to-understand inexpensive models, participants determine the direction of blood and area of convergence and origin. Is the blood evidence consistent with eyewitness accounts? Handouts!

From Love Canal to Phytoremediation: What’s New in Environmental Engineering?  
(Grades 9–12)  
Science Focus: ETS, SEP  
Michelle Griffin-Wenzel (@MGriffinwenzel; mtwenzel@att.net), Germantown (Wis.) School District  
Explore how research and inquiry-based activities are used to educate students about Superfund sites and the use of phytoremediation as a cleanup method.
Are You a Co-Teacher? Rethinking Roles Through a Consult Model  
(Grades 9–12)  
Mockingbird 4, Omni  
Science Focus: LS, SEP  
Kathryn Eilert (@eyescience; kathryneilert@gmail.com) and Sarah Klang (sklang@mcpasd.k12.wi.us), Middleton High School, Middleton, Wis.  
Imagine your co-teaching as a Venn diagram. Hear how the Consult Model can use teacher strengths and strategies to support all learners.

Becoming Teacher Leaders in a Turnaround School  
(Grades 5–12)  
Music Row 1, Omni  
Science Focus: GEN  
Sandra Sullivan (sullivans401@aol.com), Matthew J. Kuss Middle School, Fall River, Mass.  
Join me to identify your leadership style, learn strategies to become a leader at your school, and stay sane through it all.

Three Steps to Greater Use of NGSS Practices and Stellar Student Research Projects  
(Grades 6–12)  
Music Row 2, Omni  
Science Focus: GEN, NGSS  
William Rigney (@Rigney18; wfrigney@gmail.com), Massachusetts State Science & Engineering Fair, Cambridge  
Explore a three-step model in Massachusetts that is successfully helping teachers to increase use of NGSS science and engineering practices in their classrooms (grades 6–12).

How to Get Students to Open Their Textbooks and Look Forward to It  
(Grades 8–10)  
Music Row 3, Omni  
Science Focus: GEN  
John Clark (@johndwclark; johnedw@cfl.rr.com), Deltona High School, Winter Springs, Fla.  
Experience an ELA-focused lesson to improve literacy while you facilitate discovery of key science concepts within a chapter. Using a group-focused inquiry-based “Conference Learning” activity, you will have your students reading their textbooks and looking forward to doing it. Other ideas to raise literacy will also be shared.

SIRA: Science Instructional Reflection and Assessment: Creating a Curricular Road Map to NGSS  
(Grades K–8)  
Music Row 5, Omni  
Science Focus: GEN, NGSS  
Rosita Young (rosita.young@ousd.k12.ca.us), Oakland (Calif.) Unified School District  
Interested in embedding the NGSS into existing curricula? Learn about a tool that accomplished this and infused CCSS ELA, relevancy, and higher-order thinking while assessing science learning.

A Visual Representation of Three-Dimensional Learning: A Model for Understanding and a Tool for Evaluating Curricula  
(General)  
Fisk Two, Renaissance  
Science Focus: GEN, NGSS  
Ana Houseal (ahouseal@uwyo.edu), University of Wyoming, Laramie  
Become familiar with and use a new visual model to understand the power of 3-D learning, as well as identify and remedy gaps in existing curricula.

Interactive Notebooks in Middle School Science  
(Grades 5–12)  
Music City Ballroom, Renaissance  
Science Focus: GEN, NGSS  
Alicia Johal (@ALICIAJOHAL; aliciajohal@gmail.com) and Marielle Venturino (@msventurino; mari.venturino@gmail.com), Mar Vista Academy, San Diego, Calif.  
See how middle school science teachers use interactive notebooks in science to improve critical-thinking skills and organization, and enhance literacy.

Science Beyond the Classroom  
(Grades K–11)  
West Ballroom, Renaissance  
Science Focus: INF, NGSS  
Jena Valdiviezo (jvaldiviezo@longbranch.k12.nj.us), Long Branch (N.J.) Public Schools  
Hear about the development and implementation of an after-school student/parent program in which parents and students learn and work together to master the NGSS.
Hands-On Workshops

NSTA Press® Session: Uncovering Student STEM-Connected Ideas in Science
(Grades 3–College)  101C, Music City Center
Science Focus: GEN, NGSS
Page Keeley (@CTSKeley; pagekeeley@gmail.com), 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla.
Joyce Tugel (jtugel@gmail.com), Maine Mathematics and Science Alliance, Augusta
Experience a variety of formative assessment probes and techniques designed to uncover students’ thinking about the T, E, and M connections to science concepts and practices.

Motivating Modeling with Anchoring Phenomena and Challenge Questions
(Grades 7–12)  103A, Music City Center
Science Focus: GEN, SEP2
Cynthia Passmore (cppassmore@ucdavis.edu), Candice Guy (candiceguy@gmail.com), and Chris Griesemer (cdgriesemer@ucdavis.edu), University of California, Davis
Elizabeth Coleman (libcoleman@gmail.com), C.K. McClatchy High School, Sacramento, Calif.
Rich Hedman (hedmanrd@csus.edu), California State University, Sacramento
Come see how we link phenomena and questions with developing and using models. These strategies can help you with lessons to support NGSS implementation.

Connecting Scientists from the Past with Scientists in Our Classrooms: Linking Place-Based Science and Culture
(Grades P–8)  103B, Music City Center
Science Focus: ESS2, ESS3, CCC1, CCC2, CCC4, SEP1, SEP6, SEP8
Beverly Kutsunai (bekutsun@ksbe.edu), Kamehameha Elementary School, Honolulu, Hawaii
Come to this Yager scholar workshop to investigate how natural materials and traditional knowledge can provide an “old” perspective to enrich learners developing a new understanding of their world today.

Rhythm and Blues: Exploring the Science of Sound
(Grades 1–5)  104C, Music City Center
Science Focus: PS
Kristin Rearden (krearden@utk.edu) and Amy Broemmel (broemmel@utk.edu), The University of Tennessee, Knoxville
Orchestrate new learning in your classroom as you engage your grades 1–5 students with the concept of sound through apps, poetry, and hands-on activities. We will create musical instruments with common materials to demonstrate the difference between pitch and volume.

Three-Dimensional Learning of Space Systems Across Elementary Grade Bands
(Grades P–5)  104D, Music City Center
Science Focus: ESS
Caryn Walker (caryn.walkerr@jefferson.kyschools.us), Jefferson County Public Schools, Louisville, Ky.
Presider: LeeAnn Nickerson, Jefferson County Public Schools, Louisville, Ky.
We will share lesson ideas that blend three-dimensional learning in units of instruction focused on patterns in space systems.

Building Plant Literacy with NGSS and CCSS
(Grades K–5)  104E, Music City Center
Science Focus: LS, SEP
Nancy Sale (butterflybonanza@yahoo.com), Lillie C. Evans K–8 Center, Miami, Fla.
Butterfly Bonanza provides a road map to success for implementing a native butterfly habitat. Take home a starter kit that will enable you to immediately set up a habitat at your school. Door prizes and a DVD shared.

Butterfly Bonanza
(Grades P–11)  105A, Music City Center
Science Focus: LS, SEP
Sarah Carter (scarter@tpt.org) and Rita Karl (@SciGirls; rkarl@tpt.org), Twin Cities Public Television, St. Paul, Minn.
The NGSS were developed to make science accessible to all students. Discover how specific pedagogical strategies can be used with STEM activities to reach girls.
Keeping Things in Motion Using NASA and Newton’s Laws  
(Grades P–6) 106B, Music City Center  
Science Focus: ETS, PS  
Linda Smith (elementary.science.teacher@gmail.com), Retired Educator, Elmer, N.J.  
Use engineering challenges to allow your students to better understand the laws of motion.

National Earth Science Teachers Association (NESTA) Shares: Innovative Ways to Teach About Weather Observation and Weather Hazards  
(Grades 4—College) Davidson B, Music City Center  
Science Focus: ESS  
Michael Passow (michael@earth2class.org), Dwight Morrow High School, Englewood, N.J.  
Margaret Holzer (mholzer@monmouth.com), Chatham High School, Chatham, N.J.  
NESTA members will share a variety of strategies to enhance your studies of weather and weather hazards to help implement NGSS and network your school.

Arts and Science: Spark Timers, Glue, and Scissors to Study Motion  
(Grades 9–12) Legends B, Omni  
Science Focus: PS2.A, SEP4  
Meera Chandrasekhar (meerac@missouri.edu) and Dorina Kosztin (kosztind@missouri.edu), University of Missouri, Columbia  
Spark timer tape will be cut and glued to produce position-time and velocity-time graphs of uniform and accelerated motion, and will be correlated to motion diagrams. Handouts!

Using Paper Airplane Design to Teach Scientific Investigations and the NGSS Engineering Practices  
(Grades 5–10) Legends C, Omni  
Science Focus: ETS, PS2.A, CCC6, SEP1, SEP3, SEP4, SEP6  
Karen Bowers (kbowers@guhsd.net), Monte Vista High School, Spring Valley, Calif.  
Take learning to new heights as we explore two labs where students master scientific investigations and NGSS engineering practices through paper airplane design and flight.

Using Whiteboarding as a Strategy for Integrating ELA into Science  
(General) Legends E, Omni  
Science Focus: GEN, NGSS  
Andrew West (andrew.west2@colostate.edu), Colorado State University, Fort Collins  
Kelsey Sullivan (kelsey.sullivan@russellville.kyschools.us), R.E. Stevenson Elementary School, Russellville, Ky.  
Come explore how dry erase boards can be used to integrate the ELA standards into lab-based hands-on science lessons.

Planning a Journey Toward the NGSS  
(Grades K–12) Legends F, Omni  
Science Focus: GEN, NGSS  
Jennifer Gottlieb (@jgottlieb2; jgottlieb@troy.k12.mi.us), Troy (Mich.) School District  
Sarah Coleman (@mkscience; scoleman@muskegonisd.org), MAISD Regional Mathematics & Science Center, Muskegon, Mich.  
Join us as we explore tools for developing and evaluating professional learning action plans that lead stakeholders toward NGSS implementation.

...and ACTION!  
(Grades 6–12) Legends G, Omni  
Science Focus: GEN, SEP2, SEP3, SEP8  
Kristin Bundren (@MrsBundren; kbundren@hoover.k12.al.us), Amber Lewis (alewis@hoover.k12.al.us), and Jeff Johnson (@phyteach1; jjohnson@hoover.k12.al.us), Spain Park High School, Birmingham, Ala.  
Enhance lessons, engage students, and incorporate Project-Based Learning with iMovie, stopmotionHD, screencastify, and more. Bring learning into action! BYOD, bring your own device.

Showing Student Growth of the NGSS: How Do You Know That Your Students Are Really Learning?  
(Grades K–12) Center Ballroom, Renaissance  
Science Focus: GEN, NGSS  
Beth Byerssmall (elizabeth.byerssmall@maine.edu), The Maine Center for Research in STEM Education, University of Maine, Orono  
Melissa Lewis (melissa.lewis@rsu34.org), J.A. Leonard Middle School, Old Town, Maine  
Experience how K–12 teachers can use strategies of assessment for learning coupled with principles of sound design to accurately assess student growth using pre- and post-assessments aligned to the NGSS.
Saturday, 4:00–4:30 PM

4:00–4:30 PM  Presentation
Standardized Tests Put to Good Use
(Grades 5–12)  Fisk One, Renaissance
Science Focus: GEN
Kelsey Voller (@missvoller; kelsey.voller@gmail.com), Pacific Heights Academy, Sabin, Minn.
Learn how standardized exams, when used creatively, provide teachers with differentiated material, quality writing prompts, and manageable data…and they support inquiry lessons.

4:00–5:00 PM  Exhibitor Workshop
Climate Change Series VI: Climate Games and Simulations
(Grades 6–12)  201A, Music City Center
Science Focus: ESS3
Sponsor: NOAA Ocean Service
Peg Steffen (peg.steffen@noaa.gov), NOAA National Ocean Service, Silver Spring, Md.
Climate change is making severe weather events harder to predict. Learn about climate games to develop decision-making skills with students. During this workshop, make decisions as the “mayor” of a vulnerable coastal city, prepare for climate change impacts, and follow a carbon atom as it travels around Earth.

5:00–5:30 PM  Presentations
Enhanced Exit Ticket: Round-Trip to Greater Student-Teacher Accountability
(Grades 6–College)  101E, Music City Center
Science Focus: GEN, SEP
Genevive Bjorn (@GeneviveBjorn; genevive@nasw.org), Eastlake High School, Chula Vista, Calif.
Enrique Romero (enriqueromeroj@gmail.com), University of California, San Diego, La Jolla
Effective science teachers model science practices, including gathering and analyzing student performance data. We will share an innovative teaching idea that boosts accountability using an enhanced exit ticket that allows teachers to gather and analyze real-time performance data from diverse groups of learners.

4:00–5:30 PM  Exhibitor Workshop
Physics of Music
(Grades K–8)  207A, Music City Center
Science Focus: PS
Sponsor: Ward’s Science
Samantha Bonelli, VWR Science Education, Rochester, N.Y.
Let’s explore the physics of music in Nashville, Music City! Students can learn how a trombone works, play in an orchestra, or explore the concept of resonance with the demonstrations and activities included in this kit. You’ll get plastic cups, labels, masonite boards, PVC pipes of various lengths, three music box movements, instructions, and song sheets. Students will learn how physics is everywhere, even in their favorite songs.

4:30–6:00 PM  Networking Opportunity
Teacher Scientist Partnerships Reception
Broadway A, Omni
Teacher Scientist Partnership builds community and partnerships related to science education and welcomes people with diverse roles and expertise. Join us for this informational and organizational session. For additional information, please visit bit.ly/24eleE4.

Integrating Science, Reading, and Writing with a Three-in-One Project
(Grades 3–6)  104B, Music City Center
Science Focus: GEN, SEP2, SEP8
Katie Logan (katiellogan@gmail.com), Edmondson Elementary School, Brentwood, Tenn.
Integrate science, reading, and writing through the use of a three-in-one project that can be used to meet virtually all of your science standards.

Using Video Technology to Analyze Motion in a Physics Classroom
(Grades 9–12)  Cumberland 1, Omni
Science Focus: PS2.A, CCC2, CCC4, SEP4, SEP5
Matthew Oney (oneymatt@gmail.com), Escanaba (Mich.) Area Public Schools
Angela Kolonich (@akolonich; gerberan@msu.edu), Michigan State University, East Lansing
Learn how to design/enact a unit on momentum that uses video technology to engage students in data analysis and mathematical computation.
Let’s Get Talkin’ About Science!  
*(Grades 9–12)*  
*Music Row 1, Omni*  
Science Focus: GEN, SEP1, SEP6, SEP7, SEP8  
**Brittany Klimowicz***(brittany.klimowicz@uasdc.org), Urban Assembly School of Design and Construction, New York, N.Y.*  
Student-led discussions are some of the best ways for students to engage in their learning. Find protocols for facilitating student discussion.

Powering Our Students’ Futures  
*(Grades 5–10)*  
*West Ballroom, Renaissance*  
Science Focus: GEN, SEP2, SEP3, SEP4, SEP5, SEP6, SEP7, SEP8  
**Megan Heng** *(heng5321@yahoo.com), Kelly Schmidt*(kschmidt@min201.org), and **Rachel Klode**, Minooka Junior High School, Minooka, Ill.*  
Hear how a major energy corporation and local schools can team up to build student interest in science and mathematics.

5:00–6:00 PM  
**Meeting**  
NESTA Annual Membership Meeting  
*Davidson B, Music City Center*  
Find out what NESTA has been up to. Share your thoughts on directions for NESTA, and help plan for the future. For additional information, please visit [www.nestanet.org](http://www.nestanet.org).

---

**BOOT SCOOTIN’ BOOGIE!**

*Saturday, April 2, 8:00–10:00 PM, at the Frontier Room*

Frontier Room *(located above the Whiskey Bent Saloon)*

306 Broadway, Nashville, TN 37201 • 615-401-2580

Open to y’all!

*Git yerself* over to the **Frontier Room** *(directions at left)* for an opportunity to network and meet up with your colleagues on the last night of the NSTA conference.

This evening of entertainment will feature…

- **Charity Byars**, performing artist and band as well as line dance lessons and traditional bar foods for sale, including pulled pork sandwiches, sliders, tater tots, etc. (ranging from $5 to $15).
- Cash bar with the “Boot Scootin’ Bourbon” drink special!

*The Frontier Room of the Whiskey Bent Saloon has a separate entrance, which is located around the corner on 3rd Avenue and up the stairs behind the Saloon.*
5:00–6:00 PM  Presentations

Space Station Explorers  
(Grades 6–12)  
103B, Music City Center  
Nikki Hoier (nhoier@ISS-CASIS.org), Diane Matthews, and Dan Barstow (dbarstow@iss-casis.org), CASIS, Melbourne, Fla.  
The International Space Station is an amazing resource for learning and exploring. In this session, learn how to bring ISS resources into your classroom. Door prizes!

A Cross-Curricular Contamination Case: Integrating Core Content Through Self-Paced Learning  
(Grades 9–11)  
103C, Music City Center  
Science Focus: LS2, LS4, PS1  
Alexis Custer (alexis.bizzaro@gmail.com), Princeton High School, Princeton, N.J.  
Jennifer Allessio (jmallessio@gmail.com), Robbinsville High School, Robbinsville, N.J.  
Discover how students can embark on a self-paced cross-curricular unit by solving a lead poisoning case study using chemical, biological, ecological, and mathematical concepts.

We Are Engineers, Too!  
(Grades P–3)  
104A, Music City Center  
Science Focus: ETS1, SEP  
Valerie Patel (valerie_m_patel@mcpsmd.org) and Amy Kanapesky (amy_k_fletcher@mcpsmd.org), William B. Gibbs, Jr. Elementary School, Germantown, Md.  
Hear how to successfully engage students in the engineering design process in early childhood classrooms! Walk away with sample lessons and project ideas. Find out how to teach your students to be excited about making mistakes!

The Maker Movement in EC–Grade 8 Classrooms  
(Grades P–8)  
106A, Music City Center  
Elizabeth Ross, Beth Sanzenbacher, Deanna McBeath (@edumcbeath; dmcbethe@bzaeds.org), and Jeremy Siegel (@jseigel@bzaeds.org), Bernard Zell Anshe Emet Day School, Chicago, Ill.  
Incorporating the Maker Movement into formal learning environments can be challenging. This presentation showcases engaging early childhood through grade 8 scaffolded Maker curricula that meet the NGSS practices.

Glaciers: Traveling Time Capsules  
(Grades 6–12)  
104B, Music City Center  
Science Focus: ESS, SEP8  
Sylvia Tufts, Retired Educator, Flossmoor, Ill.  
The study of glaciers’ locations, movement, and composition provides an excellent opportunity to observe and analyze the effects of global climate conditions and changes over time.

Rigor and Reasoning—From Knowing Science to Understanding Science  
(Grades 6–12)  
Acoustic, Omni  
Science Focus: GEN  
Emily Freeland (@EmilyKFreeland), Alabama State Dept. of Education, Montgomery  
Increase students’ reasoning and application of scientific knowledge and processes using depth of knowledge. Explore ways to use problem-solving protocols and tasks to deepen understanding.

Food Chains: Using Field Surveys That Give Real Results  
(Grades 6–8)  
Broadway G, Omni  
Science Focus: LS2.B  
Frederick Maier (fredmaier@sbcglobal.net), Village of Itasca Nature Center, Itasca, Ill.  
Emphasis will be placed on three hands-on survey techniques that allow students to calculate actual numbers of plants, herbivores, and carnivores in creating a food chain.

Argumentation and Making the Transition to NGSS: How Do Students Develop Fluency in Engaging in Argument from Evidence?  
(Grades 6–8)  
Broadway K, Omni  
Science Focus: GEN, SEP7  
James Narvaez (james.narvaez@ousd.k12.ca.us), Oakland (Calif.) Unified School District  
The practice of argumentation connects the CCSS and NGSS, but how is this developed? Engage in an NGSS-focused performance task and hear lessons learned.

INF  
Hosting STEM Nights? Use Inquiry-Based Investigations to Engage Learners of All Ages  
(Grades 6–12)  
Cumberland 2, Omni  
Science Focus: INF, NGSS  
Karen Jacobs, Alief ISD, Houston, Tex.  
Have you ever had to plan a STEM or Science Night and needed help crafting activities to engage the community? Well, come learn simple strategies and labs you can use to truly engage learners of all age groups!
Simulate STEM Online Through Virtual Clinical Trials
(Grades 8–College) Cumberland 4, Omni
Science Focus: GEN, NGSS
Lynn Lauterbach (lynnlauterbach@gmail.com), Retired Teacher, Loveland, Colo.
Kristi Bowling, Rice University Center for Technology in Teaching and Learning, Houston, Tex.
Expose high school students to scientific and biomedical engineering practices and careers using free online simulations that engage them in technology while designing authentic neuroscience-based clinical trials. Built-in assessment notebook.

Tesla Tales
(Grades 7–12) Cumberland 5, Omni
Science Focus: GEN, SEP3
Carlos Villa (villa@magnet.fsu.edu), National High Magnetic Field Laboratory, Tallahassee, Fla.
Follow the path of discovery through the history of magnetism—with ideas for bringing these scientists and their ideas into your classroom.

Creating a Professional Learning Community to Facilitate Collaboration in Science-Inclusion Classrooms
(Grades 6–12) Electric, Omni
Science Focus: GEN
Regina Borriello (@Karategirl80; rborriello@gmail.com), Clifton High School, Clifton, N.J.
The goals of this session are to provide insight into creating and sustaining a learning community. Come discuss issues encountered while co-teaching in science classrooms.

Integration of the NGSS into an Interdisciplinary Freshman Experience Course
(Grades 12–College) Mockingbird 4, Omni
Science Focus: GEN, SEP6, SEP7
Cynthia Kern (Cindy.L.Kern; cindy.l.kern@gmail.com), Quinnipiac University, Hamden, Conn.
Rosemary Whelan (rwhelan@newhaven.edu), University of New Haven, West Haven, Conn.
Hear how eight professors from five different disciplines facilitated 160 freshmen from all majors to evaluate sustainable decision-making through evidenced-based argumentation and engagement in campus-wide activism projects.

Teaching as Storytelling: How to Infuse History, Mystery, and Inquiry into Your Science Topic Teaching
(General) Music Row 2, Omni
Science Focus: GEN
David Schuster (david.schuster@wmich.edu), Western Michigan University, Kalamazoo
Revitalize science content by creating storylines and infusing “vignette snippets” of history, mystery, and inquiry at just the right places. Leave with a booklet of science examples and vignettes.

What Happens When the Train Runs Off the Tracks? A Problem-Based Learning Module
(Grades 4–9) Music Row 3, Omni
Science Focus: ESS3, ETS
Cheryl Lindeman (clindeman@randolphcollege.edu), Randolph College, Lynchburg, Va.
I’ll share Problem-Based Learning (PBL) activities incorporating ways children make STEM decisions by experiencing local stakeholders’ roles during a local environmental event.

Retiring? Tips for the Next Phase of Your Life
(General) Fisk One, Renaissance
Science Focus: GEN
Joyce Gleason (joycegle@earthlink.net), Educational Consultant, Punta Gorda, Fla.
Susan Clay (szzieclay@aol.com), Ashland University, Ashland, Ohio
Join the Retired Members Advisory Board and explore options for this next stage of life. Topics will include volunteerism, loss of professional identity, and others.
Ramps and Pathways: An Integrated STEM Activity
(Grades P–2) 104C, Music City Center
Science Focus: ETS1, PS2, CCC2, CCC3, CCC4, SEP
Beth Van Meeteren (beth.vanmeeteren@uni.edu), University of Northern Iowa, Cedar Falls
Peggy Ashbrook (scienceissimple@yahoo.com), NSTA Early Years Columnist, Alexandria, Va.
Ramp up new learning in your classroom by having your students design and construct marble runs using cove molding and unit blocks while integrating physics, technology, engineering, and spatial thinking.

Did I Learn That? Tips and Techniques to Ensure Mastery of Science Concepts
(Grades 3–5) 104D, Music City Center
Science Focus: GEN
Shirley Willingham, Rice University, Houston, Tex.
Discover how to incorporate vocabulary activities and short readings into a review of previously taught science concepts. Walk away with a variety of ready-to-use resources!

Sound and Waves: An Integrated K–8 Hands-On Approach Supporting the NGSS and CCSS ELA
(Grades 3–8) 104E, Music City Center
Science Focus: PS4
Chihche Tai (ctai59@gmail.com), Karin Keith (keithkj@etsu.edu), Laura Robertson (robertle@etsu.edu), and Renee Moran (ricemoran@etsu.edu), East Tennessee State University, Johnson City
Leave with ideas to build confidence and understanding about using hands-on activities and literacy strategies as tools to understand the nature of wave movement.

Explore Rocks Part 1: Rock Cycle and Igneous Rocks
(Grades 3–College) 105A, Music City Center
Science Focus: ESS2.A, CCC1, CCC5, CCC6, SEP3, SEP8
Davida Buehler (dbuehler@geosociety.org), The Geological Society of America, Boulder, Colo.
Walk away with numerous inquiry-based activities that you can use immediately in your upcoming lessons on the rock cycle and igneous rocks!

Teaching the High School NGSS Disciplinary Core Ideas: Earth Systems and Human Sustainability Using Real Earthquake Location Data
(Grades 9–12) 106B, Music City Center
Patrick McQuillan (pmequillan@lsc.org), Liberty Science Center, Jersey City, N.J.
John Taber (taber@iris.edu), IRIS, Washington, D.C.
Enhance plate tectonics, natural hazards, and human impact lessons using real earthquake data. A free online global earthquake database will be explored using NGSS-focused lessons.

Riding the Waves
(Grades 4–12) Legends A, Omni
Ingrid Salim (isalim7@gmail.com), Da Vinci Charter Academy, Davis, Calif.
Kathleen Gill (@kmgill135; kmgill135@gmail.com), Robert E. Willett Elementary School, Davis, Calif.
Explore the performance expectation progression sequence of the NGSS through the waves and electromagnetic radiation disciplinary core idea.

Introduction to LinkEngineering
(Grades P–12) Legends C, Omni
Science Focus: ETS, INF, SEP1, SEP6
Greg Pearson (gpearson@nae.edu), National Academy of Engineering, Washington, D.C.
Ted Willard (@Ted_NSTA; twillard@nsta.org), Program Director, NGSS@NSTA, NSTA, Arlington, Va.
Cary Sneider (csneider@pdx.edu), Portland State University, Portland, Ore.
We will illustrate the features of the new National Academy of Engineering website for supporting the implementation of engineering in preK–12 education (www.LinkEngineering.org).

CRASH Science! Investigating the Dangers of Distracted Driving
(Grades 6–12) Legends E, Omni
Science Focus: LS, PS, SEP
Griff Jones (gjones@coe.ufl.edu) and Linda Jones (lcjones@coe.ufl.edu), University of Florida, Gainesville
Learn how to use easy-to-implement biology and physics-related STEM inquiry activities and dramatic web-based crash videos to teach students about the dangers of distracted driving.
Where big ideas become the next big thing.

By hosting Camp Invention, Club Invention or Invention Project, you are partnering with the only nationally recognized programs backed by The National Inventors Hall of Fame.

We provide educators the strategies and environment necessary to nurture curiosity into big ideas through STEM based curricula in an out of school time setting.

Programs for 1st through 8th grade students.
800.968.4332 | campinvention.org | inventionproject.org

Stop by our booth #1122 for more information!

To host a program in your community, send inquiries to campatmyschool@invent.org

In partnership with the United States Patent and Trademark Office
Stimulate Student Learning with Food!
(Grades 7–12) Legends G, Omni
Science Focus: GEN
Laurie Hayes (lhayes@cart.org), The Center for Advanced Research and Technology, Clovis, Calif.
Susan Hartley (susan.mumford.hartley@hotmail.com), Hinkley High School, Aurora, Colo.
Use food as a key ingredient to successful learning. Join us in a hands-on learning experience using food to teach science standards and integrate CCSS principles. Handouts and door prizes included!

I’m the Teacher…How Do I Teach About Nature of Science?
(Grades 4–College) Center Ballroom, Renaissance
Science Focus: GEN, SEP
Julie Angle, (julie.angle@okstate.edu), Oklahoma State University, Stillwater
To strengthen science literacy skills, learn about engaging activities that can be used to explicitly address aspects of nature of science. Take home handouts to use in grades 4–16 science classrooms or in teacher preparation courses.

5:30–6:00 PM  Presentations

Primary Literature: Students Reading Real Science
(Grades 9–College) 101E, Music City Center
Science Focus: GEN, SEP
Melissa McCartney (mmccartn@aaas.org), Science/AAAS, Washington, D.C.
Science in the Classroom (www.scienceintheclassroom.org) is a collection of annotated research papers designed to help students understand the structure and workings of professional scientific research.

Think It, Map It, Write It, Learn It!
(Grades P–2) 104B, Music City Center
Science Focus: LS1, PS1, PS2, PS4
Kimberly Lott (kimberly.lott@usu.edu), Utah State University, Logan
Deborah Roghaar (deb.roghaar@usu.edu), Edith Bowen Laboratory School, Logan, Utah
We will illustrate how different thinking maps can be used for writing in science during grades K–2 with connections made to CCSS ELA and NGSS.

Are You Bohr’d with Bonding?
(Grades 8–12) Music Row 1, Omni
Science Focus: PS
Stephanie Hawthorne, Hewitt-Trussville Middle School, Trussville, Ala.
Learn to use a 3-D manipulative when teaching the concepts of forming ions, naming, and bonding. Leave with resources and ways to build the manipulative on a budget.

The Argumentation Toolkit: The Lawrence Hall of Science Presents a Collection of Multimedia Resources to Support Teacher Learning About Argumentation
(Grades 4–10) Fisk Two, Renaissance
Science Focus: ESS2, LS3, SEP7
Traci Wierman, Kathryn Quigley, Suzanna Loper (sjloper@berkeley.edu), and Phaela Peck (ppeck@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley
We will showcase The Argumentation Toolkit, a new online multimedia resource supporting science teachers striving to infuse argumentation into their program.
6:30–7:30 PM  Networking Opportunity
LinkEngineering Reception
Legends F, Omni
Join National Academy of Engineering staff and members of NAE’s LinkEngineering website for drinks and hors d’oeuvres in this informal gathering of educators interested in supporting K–12 engineering. This event is free.

8:00–10:00 PM  Networking Opportunity
Boot Scootin’ Boogie!
located above the Whiskey Bent Saloon, Frontier Room
Open to y’all! Git yerself over to the Frontier Room (directions below) for an opportunity to network and meet up with your colleagues on the last night of the conference. This evening of entertainment will feature…Charity Byars, performing artist and band, as well as line dance lessons and traditional bar foods for sale, including pulled pork sandwiches, sliders, tater tots, and more (prices range from $5 to $15). Enjoy a cash bar with the “Boot Scootin’ Bourbon” drink special!
Located above the Whiskey Bent Saloon, the Frontier Room has a separate entrance, which is located around the corner on 3rd Avenue and up the stairs behind the Saloon.

Frontier Room: 306 Broadway, 615-401-2580
At Adventure Science Center’s Moonwalker exhibit, visitors can experience the feeling of walking on the moon and find out how high they can jump—and how lightly they come back down when only in 1/6 gravity! Show your NSTA badge and receive half off general admission to Adventure Science Center. See page 12 of Volume 1 to learn more about this special offer.
8:00–8:30 AM  Presentations
Reasons Students Struggle with Reasoning
(Grades 5–9)  106A, Music City Center
Science Focus: GEN, SEP7
Laura Rossier (rossierlj@gmail.com), F.A. Day Middle School, Newtonville, Mass.
Using student work, we’ll explore struggles with argumentation, scaffolding instruction to elicit reasoning that is both logical and based on scientific principles.

8:00–9:00 AM  Presentations
iPad Apps for STEM Activities in the Elementary Classroom
(Grades K–6)  104B, Music City Center
Science Focus: GEN, NGSS
Janet Jordan (janetjordan37@gmail.com), Retired Educator, Fort Wayne, Ind.
Discover many excellent engaging and challenging iPad apps for STEM classroom activities. Current award-winning children’s books will be linked to the apps presented, along with practical tips for integrating iPad apps into the curriculum.

What Constitutes High-Quality Discussion in a Science Classroom?
(Grades 2–8)  106C, Music City Center
Science Focus: GEN, SEP7
Emily Weiss (weisse@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley
Watch and analyze several video examples to understand what constitutes high-quality discussion in the science classroom for students in grades 3–5.

INF  Nature on My Block: Place-Based Ecology Lessons for Urban Students
(Grades 1–5)  110A, Music City Center
Science Focus: LS, INF
Cezar Simeon (csimeon@ccookschool.org), Catherine Cook School, Chicago, Ill.
Inspire city-bound students to discover the wonders of the urban woodland ecosystem that is their neighborhood.

Sources of Pedagogical Content Knowledge for Teaching Life Sciences in Middle School
(Grades 5–8)  205B, Music City Center
Science Focus: LS
David Santibáñez (dpsantibanez@gmail.com), Illinois Institute of Technology, Chicago
Learn about diverse ways to improve your life science pedagogical content knowledge to develop lesson plans based on the NGSS.

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

The science areas and their abbreviations are:
LS = Life Science
PS = Physical Science
ESS = Earth and Space Science
ETS = Engineering, Technology, and the Application of Science
GEN = General Science Education
INF = Informal Science Education

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

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

Setting the Stage: Scientific Literacy
Building the Band: Involving Community Stakeholders
Harmonizing Concepts: Integrating Instruction
Stringing It All Together: Three-Dimensional Learning

The following icons will be used throughout this program.

NSTA Press® Sessions
Sessions highlighting STEM learning experiences that occur in out-of-school environments.
Learning Targets for Student-Led Labs  
(Grades 6–8)    205C, Music City Center  
Science Focus: GEN, SEP3, SEP8  
Kirby Selle, Christel House Academy, Indianapolis, Ind.  
Prepare a mini investigation, examine student work, and receive a copy of learning targets to help students design their own investigative lab.

Teach Engineering Principles on the Cheap with Concrete  
(Grades 7–12)    206 A/B, Music City Center  
Science Focus: ETS  
Debbie Goodwin (nywin@hotmail.com), Retired High School Science Teacher, Chillicothe, Mo.  
Solidify new learning in your classroom by teaching engineering with concrete and other composite materials. Discover inexpensive STEM projects that engage students using the #1 building material in the world. NGSS correlations shared.

Forensics 101: From the Ground Up  
(Grades 6–12)    207B, Music City Center  
Science Focus: GEN  
Kristie Cannon (kcannon@hoover.k12.al.us), Spain Park High School, Birmingham, Ala.  
Receive materials and ideas to help you get your forensic science program off the ground.

Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events  
(Grades 9–12)    207C, Music City Center  
Donna Young (dlyoung.nso@gmail.com), Chandra X-Ray Center, Bullhead City, Ariz.  
Science Olympiad coaches will be provided information on strategies, extensive resources, and content for regional, state, and national competitions by the National Astronomy Event Supervisor.

Go Green! Build and Sustain a Project-Based Learning Garden Program at Your School!  
(Grades 5–12)    208A, Music City Center  
Science Focus: GEN  
Maurice DiGiuseppe (maurice.digiuseppe@gmail.com), University of Ontario Institute of Technology, Oshawa, Ont., Canada  
Blair Sawa (bsawa@pvnccdsb.on.ca), Peterborough, Victoria, Northumberland and Clarington Catholic School Board, Peterborough, Ont., Canada  
Join us for an engaging and informative workshop demonstrating strategies for building and sustaining a cross-curricular Project-Based Learning garden program at your school.

Science in the One-to-One Classroom  
(Grades 6–12)    208B, Music City Center  
Science Focus: GEN  
Lindsay Knippenberg (@ScienceWithMsK; lindsayknippenberg@mgsd.k12.nc.us) and Barbara Huth (@Huth_Barbara; barbarahuth@mgsd.k12.nc.us), Mooresville High School, Mooresville, N.C.  
What does a successful one-to-one science classroom look like? Gain management tips, activities, and lesson ideas for incorporating technology in your science class.

Integrating Literacy Standards in Science  
(Grades 9–12)    209A, Music City Center  
Science Focus: GEN, CCC4, SEP1, SEP2, SEP7  
Stephanie Harmon (@stephharm041; stephanie.harmon@rockcastle.lyschoools.us), Rockcastle County High School, Mount Vernon, Ky.  
Incorporating literacy standards in science can be a natural part of how we teach by using a variety of strategies and resources.

Partnering with Community Resources to Create a Whodunit  
(Grades 9–12)    209B, Music City Center  
Science Focus: GEN  
Mary Anne Butler, Windsor (Conn.) Public Schools  
Learn how to partner with businesses, law enforcement, government, and institutes of higher education to create authentic performance-based assessments for students.
Help Build Students’ Interest in STEM with eCYBERMISSION in Your Classroom

eCYBERMISSION is a web-based STEM competition, free to students in grades 6-9.

Compete for Awards up to $9,000 in U.S. Savings Bonds

For more information, visit us at Booth #1046

www.ecybermission.com
Industry's Role in Creating the Next Generation of Scientists
(General) 209C, Music City Center
Science Focus: GEN
Skyler Wiseman, Washington University in St. Louis, Mo.
How did a leading research-based university build collaboration with local science industries to help support an early childhood science program that has grown into a K–5 instructional program? MySci is leveling the playing field for high-quality science education in the St. Louis area. Come hear about our journey and discuss yours.

Scientists for Tomorrow: An Initiative to Promote STEM in Out-of-School-Time Frameworks
(Grades 4–12) Davidson A2/3, Music City Center
Science Focus: ETS1, INF
Marcelo Caplan (@STinitiative; mcaplan@colum.edu), Columbia College Chicago, Ill.
Scientists for Tomorrow is a program designed to provide urban youth with information and skills related to STEM through a partnership between the university and community centers. Review results and lessons learned from three years so far in my community.

Hands-On Workshops

NSTA Press® Session: CCSS ELA and Literacy + NGSS = Even More Brain-Powered Science
(Grades 5–College) 101C, Music City Center
Science Focus: GEN, CCC1, CCC2, CCC3, CCC4, CCC7, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8
Thomas O’Brien (tobrien@binghamton.edu), Binghamton University, Binghamton, N.Y.
Discrepant event activities and cartoons model how to integrate ELA and science literacy standards to show that “the whole is greater than the sum of the parts.”

Is Your Beak Stuck? How to Use the Three Dimensions of the NGSS in a Natural Selection Activity
(Grades 6–College) 103A, Music City Center
Science Focus: LS4.B, CCC2, SEP2
Virginia (Gini) Oberholzer Vandergon (virginia.vandergon@csun.edu) and Mike Rivas (mike.rivas@csun.edu), California State University, Northridge
Find out how to take a classic natural selection activity on Island Beak Evolution and transform it into a NGSS-rich lesson.

Chapter Books at the Crossroads of the NGSS and CCSS
(Grades 6–9) 103C, Music City Center
Science Focus: GEN
Christine Anne Royce (@caroyce; caroyce@aol.com), Shippensburg University, Shippensburg, Pa.
Examine different chapter book units that can help to integrate the components of the NGSS and elements of the CCSS.

A Beginner’s Guide to Engineering Design Challenges
(Grades 3–5) 104C, Music City Center
Science Focus: ETS1
Holly Mentillo (mentillo@earthlink.net), Ocean Breeze Elementary School, Melbourne, Fla.
Betty Bigney (bettybigney@hotmail.com), Dixon Elementary School, Holly Ridge, N.C.
Join us for a step-by-step walk through the engineering design challenge process. Come find out how much fun they can be and take home a lot of ideas for your classroom!

Exploring Different Acid/Base Indicators in the Classroom
(Grades K–5) 104D, Music City Center
Science Focus: GEN, NGSS
Rebecca Dyasi (bdyasi@aol.com), Long Island University, Brooklyn, N.Y.
Hubert Dyasi, Retired Educator, Yonkers, N.Y.
Learn how prospective teachers engage in and use experiences with plant-based and commercial indicators to engage city children in science practices, understandings, and communication and self-assessment skills.

Engineering Through Children’s Literature
(Grades K–5) 104E, Music City Center
Science Focus: ETS1, SEP
Patricia Maze (@AMSTI_Athens; patricia.maze@athens.edu), AMSTI-Athens, Ala.
Emily McGahee (@AMSTI_Athens; emily.mcghee@athens.edu), Athens State University, Athens, Ala.
Put the science and engineering practices into action in your classroom? Come design, create, and test solutions to problems presented in popular children’s literature.
**Project-Based Learning (PBL) for 21st-Century Thinkers and Innovators**  
*Grades P–8*  
Science Focus: GEN, SEP  
Seema Khan, RAFT San Jose, Calif.  
Implement the PBL approach to help students build knowledge and skills through technology and real-world experiences while implementing NGSS in your classroom.

**Climate Science: How Can Such a Serious Topic Be So Much Fun?!?**  
*Grades 4–8*  
Kathleen Christie-Blick (@christieblick@socsd.org), Cottage Lane Elementary School, Blauvelt, N.Y.  
Jacob Tanenbaum (jtanenbaum@socsd.org) and Samantha Levine (sdd131424@yahoo.com), South Orangetown Central School District, Blauvelt, N.Y.  
Harness this NGSS’s Earth science unit to teach climate change. Use classroom-tested hands-on activities that deepen scientific understanding of this important core idea. Come play!

**Hot Topics Workshop: Nuclear Energy**  
*Grades 9–12*  
Science Focus: PS  
Kathleen Dwyer (@msdchemistry; kathleen.dwyer@m rh-schools.net), MRH High School, Maplewood, Mo.  
Tracie Cain (tcain02@charter.net), Visitation Academy, Saint Louis, Mo.  
Activate your nuclear knowledge! Use marble nuclei to model isotopes, radioactive decay, and fragmentation. Learn how these processes are used to create usable energy.

**Illuminate Intelligence with Creative Circuits**  
*Grades K–12*  
Science Focus: PS, SEP2  
Gina Tesoriero (@stemsucceeded; ginatesoriero@gmail.com) and Amanda Solarsh (amandasolarsh@gmail.com), Simon Baruch MS104, New York, N.Y.  
Hands-on circuitry exploration can light up your classroom. Explore accessible materials that can electrify circuits and STEAM up your curriculum.

**Learning to Fail: Building Confidence with Data Collection**  
*Grades 9–12*  
Science Focus: GEN, NGSS  
Jessica Kohout (@MrsKohout; jessica_kohout@hcpss.org), Reservoir High School, Fulton, Md.  
Do your students have trouble taking risks for fear of failure? Give them a science “toolbox” to overcome any challenge in the lab.

**EdTech and Your Ideal Classroom: Using Educational Technology to Support a Science Classroom Community**  
*Grades 9–College*  
Science Focus: GEN, SEP  
Stephen Traphagen (@mrtraphagen; stephen@m rtraphagen.com), Rolling Meadows High School, Rolling Meadows, Ill.  
Kirstin Milks (@DrMilks; kmilks@mccsc.edu), Bloomington High School South, Bloomington, Ind.  
Go beyond self-paced mastery, flipped classrooms, and increasing lab time. Come think about ways to use EdTech to make time for intellectual risk-taking, science practice, and promoting classroom community.

**Science Is a Social Endeavor: Scientific Inquiry Through Collaborative Work**  
*Grades 7–12*  
Science Focus: ESS, PS, CCC, SEP1, SEP4, SEP6, SEP7, SEP8  
Susan Kelly, University of Illinois at Urbana-Champaign, Champaign  
Join education researchers from the University of Illinois, and learn how to support authentic scientific inquiry by implementing collaborative learning activities in your science classroom.

**Your Ecological Footprint in a 3-D NGSS Classroom**  
*Grades 4–College*  
Science Focus: ESS, CCC  
Laurel Kohl (kohl@easternei.edu), The Institute for Sustainable Energy, Williams College  
The world’s resources are finite. What alternatives are there? This is a three-dimensional lesson from www.ctenergyeducation.com allowing Grades 4–12 students to explore their impact on the world.
Sunday, 8:30–9:00 AM

8:30–9:00 AM  Presentations

Using Expeditions as Contexts for Teaching Science: Adventure Mississippi River
(Grades 5–12) 101E, Music City Center
Science Focus: GEN
Brant Miller (bgmiller@uidaho.edu), University of Idaho, Moscow
Hear about an approach to engage students in authentic science learning through an adventure on the Mississippi River.

Universal Design for Learning: What It Is, and What It Isn’t
(Grades 4–9) 106A, Music City Center
Science Focus: GEN
Gregory Taylor, Thurgood Marshall High School, Dayton, Ohio
Receive an overview of Universal Design for Learning as common misconceptions are addressed. Find out what implementing UDL would look like in your science classroom.

9:30–10:00 AM  Presentations

Science Fair: A Learning Progression Across K–5
(Grades K–5) 101E, Music City Center
Science Focus: GEN, CCC, SEP
Teresa Higgins (teresa.higgins@unco.edu), University of Northern Colorado, Greeley
Lisa Dye (lisa_dye@dpsk12.org), Lena Lovato Archuleta Elementary School, Denver, Colo.
Challenged with school-wide science fairs? Looking for ways to support science literacy in your school’s program? We will share the details and strategies of scaffolding and supporting a whole-school K–5 model for science fairs, including insights for supporting English language learners and addressing standards.

How Does Vocabulary Fit into PBL for English Language Learners?
(Grades K–6) 104A, Music City Center
Science Focus: GEN, SEP
Sara Holm, Smithridge STEM Academy, Reno, Nev.
Hear how teachers from an elementary STEM academy integrate focused vocabulary instruction into Project-Based Learning.

Let’s Explore: The Changes That Surround Us
(Grades 4–8) 106A, Music City Center
Science Focus: ETS, LS1, LS2, PS2.C, PS4.C
Beth Guzzetta (@bethguzzetta; bguzzetta@allendalecolumbia.org), Martha Bjorklund (mbjorklund@allendalecolumbia.org), and Kate Bjorklund (kbjorklund16@allendalecolumbia.org), Allendale Columbia School, Rochester, N.Y.
Hear how our students identify factors that negatively affect the ecosystem in our community and state, and then develop student-motivated projects addressing ecosystems restoration.

Planting the Seeds to Cultivate Meaningful Science Practices in Garden Classrooms
(Grades P–3) 103B, Music City Center
Science Focus: LS, CCC1, CCC4, CCC5, CCC6, SEP2, SEP3, SEP6
Michelle Fleming (michelle.fleming@wright.edu), Wright State University, Dayton, Ohio
Colleen Saxen (colleenxsaxen@gmail.com), Kozmetsky Global Collaboratory, Stanford University, Dayton, Ohio
Eileen Simon (e_d_simon@hotmail.com) and Alison Peters (alisonraepeters@yahoo.com), Oakwood City School District, Dayton, Ohio
This project engaged the community in creating school gardens. Learn interactive science notebook methods, experiments, and investigations connecting garden classrooms to NGSS practices and CCSS.
Session 1
Date: Thursday, Mar 31
Time: 2:00-3:30 PM
Room: Music City Center, 108
Inspire Students to Jump to the Inquiry Arc

Session 2
Date: Friday, Apr 1
Time: 12:00-1:30 PM
Room: Music City Center, 108
Analyzing and Interpreting Data Using TCI’s Bring Science Alive!

Session 3
Date: Saturday, Apr 2
Time: 10:00-11:30 AM
Room: Music City Center, 108
Modeling the Earth, Sun and Other Stars with Bring Science Alive!

teachtc.com
9:30–10:30 AM  Presentation  

**Project-Based Learning: How It Has Changed Teaching and Learning in Our School**  (Grades K–8)  103C, Music City Center  

Science Focus: GEN, SEP  

Amanda Popovich (apopovich@dps61.org) and Ashley Keeling, Dennis Lab School, Decatur, Ill.  

Hear how we have implemented Project-Based Learning. Our students are tackling real-world authentic problems through true content integration. We can help you get there, too!  

**Transforming Schools Through Professional Development: An Interconnected Approach**  (Grades P–5)  104B, Music City Center  

Science Focus: GEN, NGSS  

Jenny Flowers (jflowers@fieldmuseum.org), The Field Museum, Chicago, Ill.  

Learn about the layered and interconnected professional learning strategies used in a multi-institutional partnership designed to transform preK–3 teachers' science instruction in 10 Chicago elementary schools.  

**Coding Computer Games to Motivate Middle School Science Students**  (Grades 5–12)  108, Music City Center  

Science Focus: GEN  

Joanne Barrett (@jbarrettsrq; jbarrett@oda.edu), The Out-of-Door Academy, Middle & Upper School, Sarasota, Fla.  

Learn how we use Scratch, a free programming environment with no coding experience necessary, to create games and animations in creative ways.  

**Fall Head Over Heels for Flipping Your Classroom!**  (Grades 6–12)  109, Music City Center  

Science Focus: GEN  

Lisa Wolfinger, Michigan Connections Academy, Okemos  

Want to learn more about how to engage students in science? Come to our flipped session that integrates mastery learning and focuses on individualized instruction to help your students find success.  

**“Pitching” Student Innovation and Community Building Through Shark Tank**  (Grades 6–12)  202A, Music City Center  

Science Focus: ETS1  

Amanda Solarsh (amasolarsh@gmail.com) and Gina Tesoriero (@stemsuccessedu; ginatesoriero@gmail.com), Simon Baruch MS104, New York, N.Y.  

Lead students to the perfect pitch for their innovative solutions through a Shark Tank–inspired engineering design project that brings the community into the classroom.  

**Using Flipped Classrooms to Assess the Mastery of Objectives in Middle School**  (Grades 7–8)  205B, Music City Center  

Science Focus: GEN  

John Pappas, Carleton Washburne School, Winnetka, Ill.  

Hear how to effectively use a mastery model to assess students' performance on objectives in a flipped classroom framework.  

**Moon “Face” Model**  (Grades 5–8)  205C, Music City Center  

Science Focus: ESS1.A, ESS1.B, CCC4  

Whitney Jackson (wjackson@go.olemiss.edu), The University of Mississippi, University, Miss.  

Experience how to bring this content down to Earth so all students can leave your class with a better understanding of what causes moon phases.  

**Supporting STEM/STEAM Curriculum in the Digital Age**  (Grades 5–12)  207A, Music City Center  

Science Focus: GEN  

Presenter to be announced  

Find out how PBS is helping educators across the country embrace the digital age and promote more meaningful integration of STEM/STEAM across the curriculum.  

**Integrating Reading and Math in the Science Curriculum to Increase Student Achievement**  (Grades 6–12)  207B, Music City Center  

Science Focus: PS1, SEP1, SEP2, SEP4, SEP5  

Danielle Moore, Fort Worth (Tex.) ISD  

With more students entering science classrooms at or below grade level in reading and/or mathematics, it is imperative that the science instructor strategically plan and execute methods that will increase student achievement by embedding reading and/or mathematics seamlessly into the science curriculum.
Science Teaching for Social Justice  
(Grades 6—College)  
207D, Music City Center  
Science Focus: ETS2.B, CCC1, CCC2, CCC7, SEP1, SEP3, SEP4, SEP6, SEP7, SEP8  
Moses Rifkin, University Prep, Seattle, Wash.  
Teaching for social justice can be part of science education. A scientific exploration and analysis of who does science leads to questions of equity.

Beyond the Gumdrop Mountain: Using Models in Your Classroom  
(Grades 9–12)  
209A, Music City Center  
Science Focus: GEN, SEP2  
Lesley Shapiro (lesley.shapiro@ppsd.org), Classical High School, Providence, R.I.  
Put away the construction paper, glue, clay, and paint. Come discover the exciting new world of models opened up by the NGSS.

Cheap STEM Lessons for the Classroom  
(Grades 9–12)  
Davidson A2/3, Music City Center  
Science Focus: ETS, SEP  
Briana Richardson (briana.richardson@wchcs.org), Washington High School, Washington Court House, Ohio  
Scott Spohler (sspohler@mplsd.org), Madison-Plains High School, London, Ohio  
Explore STEM with concrete, metal, and clay. Apply math concepts and pull in lots of real-world examples. Supplies are cheap and kids love destructive testing!

9:30–10:30 AM Hands-On Workshops

(Grades 5—College)  
101C, Music City Center  
Science Focus: ESSI.A, ESSI.B, CCC, SEP  
Page Keeley (@CTSkeeley; pagekeeley@gmail.com), 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla.  
Brian Kruse (@astroteacher8m8; bkruse@astrosociety.org), Astronomical Society of the Pacific, San Francisco, Calif.  
Discover how to link formative assessment to a modeling activity on eclipses to create conceptual change in preparation for the Great American Eclipse in 2017!

From Memorization to Modeling—Reconceptualizing Teaching About Cellular Division  
(Grades 9–12)  
103A, Music City Center  
Science Focus: LS1.B, CCC2, CCC4, SEP2, SEP6  
Robert Wallon (@rwallon; rwallon2@gmail.com) and Barbara Hug (bhug@illinois.edu), University of Illinois at Urbana-Champaign, Champaign  
Experience activities that use modeling to teach about cellular division, and leave with ideas for modifying curriculum materials to better meet the NGSS.

Evaluating Mobile Applications for Teaching Science  
(Grades P—6)  
104C, Music City Center  
Science Focus: ETS  
Krista Adams (@dr_darth; kadams12@unl.edu), Soo-Young Hong (shong5@unl.edu), and Shannon Feagin (snfeagin@gmail.com), University of Nebraska–Lincoln  
Mobile applications are for more than entertainment! Learn how to evaluate mobile applications to effectively engage your students in learning and doing science.

It’s Magnetic! Using Mathematics to Enhance Science Learning  
(Grades 3–5)  
104E, Music City Center  
Science Focus: PS2.B, CCC2, SEP2, SEP3, SEP4, SEP6, SEP7  
Elizabeth Gajdzik (egajdzik@purdue.edu), INSPIRE–Purdue University, West Lafayette, Ind.  
Experience hands-on mathematics to demonstrate how it can promote deeper science understanding when solving an engineering problem.
Cheap Investigations…Priceless Student Learning  
(Grades 9–12) 105A, Music City Center  
Jean Gillespie (jgillespie@hoover.k12.al.us) and Emily Dunn (emdunn@hoover.k12.al.us), Spain Park High School, Birmingham, Ala.  
Engage in examples of inexpensive, doable hands-on investigations in ecology/environmental science that promote student development of science practices and knowledge.

Inquiry Through Teamwork!  
(Grades 4–8) 106B, Music City Center  
Science Focus: GEN, SEP  
Jennifer Casey, East Hamilton School, Knoxville, Tenn.  
Through a bit of teamwork you will problem-solve and build various simple hands-on designs without any instruction of HOW to do it. Inquiry at its best!

Modeling the NGSS Way  
(Grades K–8) 106C, Music City Center  
Science Focus: GEN, SEP2, SEP7  
Randy Bell (randy.bell@oregonstate.edu), Oregon State University, Corvallis  
Participate in engaging activities designed to clarify and teach scientific modeling to elementary and middle school students. You’ll receive free resources and lessons.

Engineering for Kindergartners? You Bet!  
(Grades P–1) 110A, Music City Center  
Science Focus: ETS  
Linda Smith (elementary.science.teacher@gmail.com), Retired Educator, Elmer, N.J.  
Yes, kindergartners can master the E in STEM. Engage with us as we complete a variety of engineering projects specifically designed for kindergarten students and the NGSS.

Climate Change Education Inside Out  
(Grades 6–12) 201A, Music City Center  
Pat Harcourt (phartcour@usc.edu), MADE CLEAR, Annapolis, Md.  
Climate change education works best when it includes classroom and outdoor experiences. I’ll share ideas for integrating environmental studies with classroom climate change activities.

Examining the Evidence: Using Data to Pose and Answer Questions Around Earth’s Changing Climate  
(Grades 8—College) 201B, Music City Center  
Science Focus: ESS, SEP4, SEP7, SEP8  
Margie Turrin (mkt@ldeo.columbia.edu), Lamont-Doherty Earth Observatory, Palisades, N.Y.  
When scientists have questions they turn to data, as should our students. In the last 100 years, sufficient data have been collected to measure warming in Earth’s climate.

Using Models and Motion for Teaching DNA and Protein Synthesis  
(Grades 9–College) 202B, Music City Center  
Carol Robertson (crobertson.fulton@gmail.com), Fulton High School, Fulton, Mo.  
Engage in kinesthetic activities and build inexpensive models to help students learn DNA structure, DNA replication, and protein synthesis while using a 5E (Engage, Explore, Explain, Elaborate, and Evaluate) approach.

Professional Learning Communities: An Interdisciplinary Collaboration Between Secondary Physical Science and CTE Teachers  
(Grades 9–12) 202C, Music City Center  
Science Focus: LS, PS  
Jennifer Butler (@jenwbutler; jbutler08@hotmail.com; jennifer.butler@fwisd.org), Fort Worth (Tex.) ISD  
I’ll explain how secondary science and Career and Technical Education (CTE) departments can implement learning strategies from an interdisciplinary approach to improve student engagement.

Are You EQuIPped?  
(Grades 7–12) 204, Music City Center  
Science Focus: GEN, NGSS  
Cheryl Heitzman, Adjunct Professor and Grad Student, Nashville, Tenn.  
Prepare for NGSS alignment by learning to use the EQuIP science rubric to evaluate your reform-based lesson plans for three-dimensionality. Lesson plans and template provided.
2016 Ward’s NSTA Workshop Schedule

Hands-On Training with the Ward’s Science Plus Us Team

All Workshops are Located in Ward’s Science Workshop Room #207A

Thursday, March 31
8:00 – 9:30 a.m.  Artificial Selection, it’s unnatural!
10:00 – 11:30 a.m. Forces, Integrations and Energy, Oh My
12:00 – 1:30 p.m.  Introduction to BioBuilder
2:00 – 3:30 p.m.  Lift Weight and Produce Electricity with the Power of Wind
4:00 – 5:30 p.m.  CTE: Real life Forensics Brought to the Classroom, Solving the Case

Friday, April 1
8:00 – 9:30 a.m.  Outbreaking Bad!!
10:00 – 11:30 a.m. Apply the Science of Energy, Motion, and Friction
12:00 – 1:30 p.m.  Fracking the CASE
2:00 – 3:30 p.m.  Grant Writing: Designing for Dollars
4:00 – 5:30 p.m.  Chemistry of Wine

Saturday, April 2
8:00 – 9:30 a.m.  Vampire Chronicles: Sink Your Teeth into Genetics and Blood Typing
10:00 – 11:30 a.m. Grant Writing: Pipelines, Partnerships, and Finding Funding
12:00 – 1:30 p.m.  Let physics show how cars may really drive themselves in the future with the ERGOBOT!
2:00 – 3:30 p.m.  Elementary Science Activity Jamboree
4:00 – 5:30 p.m.  Physics of Music

Stop by Booth #142 to see our latest products and enter to win science prizes!
Drill into the Past with the International Ocean Discovery Program
(Grades 3–9) 205A, Music City Center
Elizabeth Christiansen (eacconsulting1@gmail.com) and Juliet Crowell (crowelljuliet@gmail.com), International Ocean Discovery Program, College Station, Tex.
Dive into science aboard the Research Vessel JOIDES Resolution. Travel back through Earth’s history via classroom activities and live broadcasts with scientists of the JR.

Exploring Earth Science: Hands-On NGSS-Based Investigations from the Exploratorium
(Grades 4–College) 207C, Music City Center
Science Focus: ESS2
Eric Muller (emuller@exploratorium.edu), Exploratorium, San Francisco, Calif.
Let’s cover the basics of heat transfer via convection and seafloor spreading all with make-and-take, easy-to-do, content-rich “Snack” activities.

From Silos to STEM: Developing Real Thinkers
(Grades 7–12) 208B, Music City Center
Science Focus: ESS1, ETS, PS1, PS2, PS3, CCC2, CCC3, CCC4, CCC5, CCC6, CCC7, SEP
Amy Scheer, Mary Institute and Saint Louis Country Day School, Saint Louis, Mo.
Experience a STEM course that uses an inquiry-based approach and the book *The Martian* to develop understanding of science and math concepts.

Something Worth Writing About: Using Literacy Techniques to Engage More Students in STEM
(Grades 6–12) 209B, Music City Center
Science Focus: PS2, SEP1, SEP8
April Lanotte (april.lanotte@gmail.com), NASA Langley Research Center, Hampton, Va.
Increase engagement and students’ analytical and communication skills through literacy techniques and your content expertise. Teach students to think, read, and write like a scientist.

Learning About Earth’s Hydrosphere Using STEAM Skills!
(Grades 3–10) 209C, Music City Center
Science Focus: ESS2.C, ESS3.C, ESS3.D, SEP1, SEP2, SEP3, SEP4, SEP6, SEP8
Judith Lucas-Odom (@Judith_Odom; judyps23@yahoo.com), Chester High School, Chester, Pa.
Through the use of STEAM criteria skills, complete hands-on activities to enhance understanding of water processes in our lives.

10:00–10:30 AM Presentations

Using Web-Based Resources to Assist Diverse Learners to Learn Scientific Concepts While Engaging in Science Practices
(Grades 9–College) 101E, Music City Center
Laura Barden-Gabbei (lm-barden@wiu.edu), Western Illinois University, Macomb
Jaime Matys, Tinley Park High School, Tinley Park, Ill.
Stephanie Stenger (@SciLearnCenterNSTA16; stengersm86@gmail.com), Virginia (Ill.) CUSD #64
Join us for an introduction to a variety of lessons that use web-based resources to help a diverse group of students learn content while engaging in science practices.

Building a Learning Garden While Integrating Literacy and Science
(Grades K–8) 103B, Music City Center
Marie Dennan (@TheKitchenComm; @SCSK12Unified; @yourscience04; marie@thekitchencommunity.org), The University of Memphis, Tenn.
Dedric McGhee (@TheKitchenComm; @SCSK12Unified; @yourscience04; mcgheed@scsk12.org), Shelby County Schools, Memphis, Tenn.
Hear how the Kitchen Community in partnership with Shelby County Schools built learning gardens in Memphis, creating experiential learning opportunities connected to curriculum and growing food.
11:00–11:30 AM  Presentation
Using Eclipses to Teach the Evolution of Astronomy
(Grades 9–College)  206 A/B, Music City Center
Science Focus: ESS
Katrina Brown (kwb@pitt.edu) and Todd Brown (ltbrown@pitt.edu), University of Pittsburgh at Greensburg, Pa
We will discuss how we use a historical database of national newspapers to discuss the evolution of astronomical concepts, particularly eclipses.

11:00 AM–12 Noon  Presentations
NSTA Press® Session: Forensics in Chemistry
(Grades 10–12)  101C, Music City Center
Science Focus: PS, SEP
Angela Codron (codrona@unit5.org), Normal West High School, Normal, Ill.
Forensics is the foundation in this yearlong lab series. As students solve the case, the narrative shows the relevance of chemistry. Rubrics that support the NGSS will be provided.

Strengthening K–12 Teachers Through AMS Professional Development Programs
(General)  104A, Music City Center
Science Focus: ESS
Presenter to be announced
Learn how to effectively teach Earth system sciences with help from the AMS’s free graduate courses in weather, ocean, and climate!

Elementary Science Camps
(Grades K–6)  104B, Music City Center
Science Focus: GEN
Frieda Lamprecht (@aisd_science; @AISD_Science; flamproc@austinisd.org), Austin (Tex.) ISD
Kim Hanson (kim.hanson@austinisd.org), Langford Elementary School, Austin, Tex.
Pamela Kling (pamela.kling@austinisd.org), Cowan Elementary School, Austin, Tex.
Experience how Elementary Science Camps can transform low-performing students into engaged, confident scientists. Ideas for implementation in your classroom, school, or district are provided.

How to Scaffold Scientific Literacy for ELLs
(Grades 6–9)  106C, Music City Center
Science Focus: GEN
Tanya Warren (tanya.warren@fwisd.org), International Newcomer Academy, Fort Worth, Tex.
Jingjing Ma (winsuncoco@gmail.com), Texas Christian University, Fort Worth
The International Newcomer Academy in Fort Worth has been teaching English language learners in an urban district for more than 21 years. Literacy, both in English and in science, is a major focus of the instruction. Hear how INA has designed lessons that incorporate rigorous science practice while building scientific literacy for newcomer ELLs.

What Constitutes a STEAM Effective Practice? Learn Findings from Research Conducted by a National STEAM Collaborative
(Grades K–12)  108, Music City Center
Science Focus: GEN, NGSS
Lucinda Presley (@LucindaPresley; lucinda.presley@gmail.com), ICEE Success Foundation, Palestine, Tex.
Learn what makes a STEAM effective practice, including national research results and examples. Research conducted by a consortium of leading national institutions, including NSTA.

Geospatial Technology and Its Applications
(Grades 10–12)  109, Music City Center
Science Focus: ESS, ETS, CCC3, CCC4, CCC7, SEP5
Pia van Benthem (pvanbenthem@ucdavis.edu), University of California, Davis
Science and applications of Geographic Information Systems are continuously used in daily lives, e.g. navigation software. The presentation shows lesson plans using free GIS software.
How STEM Career Interest Changes in High School
(Grades 9–College) 201A, Music City Center
Science Focus: GEN, SEP4
Philip Sadler (psadler@cfa.harvard.edu) and Gerhard Sonnert (gsonnert@cfa.harvard.edu), Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass.
We will present results of a large-scale national study about changes in students’ STEM career interest during high school, with a particular focus on gender differences.

Integrating Digital Games into Instruction to Address Crosscutting Concepts
(Grades 6–8) 205B, Music City Center
Science Focus: PS3, CCC
Marian Pasquale (mpasquale@edc.org), EDC Center for Children and Technology, New York, N.Y.
Get introduced to evidence-based instructional strategies that can help connect digital game play to students’ further exploration of challenging science concepts.

Bring the Science of Cars into the Classroom Basic
(Grades 8–12) 207A, Music City Center
Science Focus: ETS, CCC, SEP2, SEP6
Andrew Nydam (andrewnydam@hotmail.com), Polymer Ambassador, Olympia, Wash.
Students love cars but dislike science? Here are some lessons using the car to teach major science concepts. Yes, even if you are mechanically challenged!

The Science of Natural Disasters: A High School Elective
(Grades 6–12) 207B, Music City Center
Science Focus: GEN, SEP1, SEP2, SEP6
Scott Shoup, The McCallie School, Chattanooga, Tenn.
Natural disasters impact millions around the globe annually and provide an excellent medium for high school seniors to review and apply science. Hear about my experiences teaching a science of natural disasters elective to high school seniors using factual novels and a framework of investigation, prevention, mitigation, and response.

Climate Change Research on the Arctic Tundra: Lessons and Labs from Teachers at Toolik Field Station in Alaska
(Grades 6–12) 207D, Music City Center
Science Focus: ESS, ETS, LS, SEP5
Regina Brinker (@brinkerscience; r.brinker@sbcglobal.net), Granada High School, Livermore, Calif.
Bruce Taterka (btaterka@gmail.com), West Morris Mendham High School, Mendham, N.J.
Based on fieldwork on the Alaskan tundra, we will share NGSS-focused lessons and labs for biology, Earth, climate science, and engineering at middle school and high school levels.

Making the Science Curriculum Culturally Relevant
(Grades 4–9) 208A, Music City Center
Science Focus: GEN
Michael Clinchot and Johanna Mendillo, John D. O’Bryant School of Mathematics and Science, Boston, Mass.
Erin Hashimoto-Martell (ehashimoto@bostonpublicschools.org), Dearborn STEM Academy, Boston, Mass.
We will describe the process of how we adapted a nationally distributed curriculum to be culturally relevant to the students in our classes.

Science Lab Renovations: Working Strategically with Architects to Create 21st-Century Labs
(Grades 6–College) 209A, Music City Center
Science Focus: GEN
Steve Wood (swood@d125.org), Adlai E. Stevenson High School, Lincolnshire, Ill.
Thoughtful lab renovations require collaboration between teachers, administrators, and architects. I’ll highlight specific design elements, lessons we learned, and ways to maximize stakeholders’ expertise.

Planning in 3-D: Preparing Lessons for Three-Dimensional Learning
(Grades 9–12) 209B, Music City Center
Science Focus: GEN, NGSS
Jaimie Foulk, Camdenton, Mo.
Learn ways to select, design, and evaluate lessons that integrate the three dimensions of the NGSS, and create authentic learning experiences for your students.
The Society for Science & the Public helps teachers educate and inspire students.

**Science News for Students**—our free website with news stories, features and ideas for hands-on activities that connect the latest in scientific research to in- and out-of-classroom learning.

**Science News in High School**—our award-winning magazine delivered to your classroom together with an online educator guide.

**Acclaimed education competitions**—Intel Science Talent Search (STS), the Intel International Science and Engineering Fair (ISEF), and the Broadcom MASTERS recognize young scientists and teach them how to conduct best-of-class, inquiry-based scientific research.

**Advocate Grants**—stipends and support for mentors who help under-represented students successfully enter their science or engineering research projects in scientific competitions.

UNIVERSAL MAP  This diagram, made up of stitched together NASA imagery, is essentially a map of the observable universe. The solar system is at center. The scale changes as you move outward so that the distances depicted toward the edge of the circle are enormous.
Unmismoobjetivo/Wikimedia Commons (CC BY-SA 3.0)

Stop by booth 1057 to learn more and sign up for our free Science News e-mail newsletter.

www.societyforscience.org | www.sciencenews.org | www.sciencenewsforstudents.org
UFOs, Crime Scenes, Mysteries, and More! Family Science Night in Action!
(General) 209C, Music City Center
Science Focus: INF, SEP
Caleb Cheung (caleb.cheung@ousd.k12.ca.us), Oakland (Calif.) Unified School District
Get inspired! Design your own Family Science Night from start to finish. Involve hundreds of students, family members, and teachers...includes detailed notes and variations.

Ocean Robotics in a Landlocked 1:1 STEM Classroom
(Grades 6–12) Davidson A2/3, Music City Center
Science Focus: ETS2.A, SEP2
Kirk Beckendorf (kirkbeckendorf@gmail.com) and Miller Callaway (@miller_callaway; miller_callaway@webbschool.org), Webb School of Knoxville, Tenn.
Join co-teachers as they describe the ups and downs of middle school students developing underwater robots, ocean drifters, and connecting with ocean explorers on the Exploration Vessel Nautilus.

11:00 AM–12 Noon  Hands-On Workshops

Orchestrating a Scientific Symphony with the Three Dimensions of the NGSS
(Grades 6–12) 103A, Music City Center
Mindy Pearson (@ScienceMindy; mindy.pearson@sdhc.k12.fl.us) and Michele Detwiler (michele.detwiler@sdhc.k12.fl.us), Hillsborough County Public Schools, Tampa, Fla.
Explore integrating the NGSS disciplinary core ideas, cross-cutting concepts, and science and engineering practices through an exemplar lesson on matter and energy in organisms and ecosystems.

Energize Your Classroom While Teaching Tough Science Concepts
(Grades 5–12) 103B, Music City Center
Science Focus: PS
Linda Fonner (@linda12.vv.us), New Martinsville Elementary School, New Martinsville, W.Va.
Hands-on activities explore the forms of energy: motion, heat, light, sound, electricity, and energy transformations. Gain confidence teaching energy concepts and receive free materials to energize your classroom!

Rockin’ Earth Science: Weathering and Erosion
(Grades 3–6) 104C, Music City Center
Science Focus: ESS2.A
Barbara Brightman (barbara.brightman@sdhc.k12.fl.us), Hillsborough County Public Schools, Tampa, Fla.
Trudy Johnson (cherokee1@mailmt.com), Independent Educational Consultant, Myakka City, Fla.
Come participate in inquiry-based hands-on investigations to experience and understand weathering and erosion in a teacher-friendly, student-friendly way.

Cole’s Aquarium: Intentional Integration of Grade 5 Science and Math
(Grade 5) 104D, Music City Center
Science Focus: LS2.A, CCC1, SEP5
Donna Barrett (@donna.science; williamsd17@fultonschools.org) and Denise Huddleston (@denisehudd; denise.huddleston@mresa.org), Metro RESA, Smyrna, Ga.
Cole is planning an aquarium and needs your help! He needs to calculate the volume, select a variety of diverse organisms, and create a budget.

Data Literacy for Science Teachers: Understanding and Integrating CCSS Mathematics Data Standards to Strengthen Your Science Curriculum
(Grades 6–9) 103C, Music City Center
Science Focus: GEN, SEP1, SEP3, SEP4, SEP5, SEP8
Elizabeth Novak (enovak@ccles.info), Cape Cod Lighthouse Charter School, East Harwich, Mass.
Practice using statistical methods that students use in CCSS Math classes. See examples of how integrating these standards into science classes can strengthen your science curriculum.

Managing Moving Molecules: A Hands-On Modeling Approach to Photosynthesis and Cellular Respiration
(Grades 4–8) 104E, Music City Center
Science Focus: LS1.C, SEP2
Shumit DasGupta (sdasgupta@calacademy.org) and Clea Matson (cmatson@calacademy.org), California Academy of Sciences, San Francisco
Join us to explore a kinesthetic approach to photosynthesis and cellular respiration through the lens of the NGSS practice of developing and using models.
Using the Outdoors to Teach Grade 3 Students About Relationships Within an Ecosystem
(Grades 2–4) 105A, Music City Center
Science Focus: INF, NGSS
Jamie Garaventa (jamie@sierranevadajourneys.org), Sierra Nevada Journeys, Reno, Nev.
Explore ways to use real-world experiences and three-dimensional learning to teach elementary students about the interdependent relationships in ecosystems.

Aerospace Adventurers: Launching an After-School Aeronautics and Space Education Program
(Grades 3–8) 105B, Music City Center
Science Focus: ESS, ETS, INF
Stuart Sharack (sharack@aol.com), Aviation Career Education (ACE) Academy Program, Waterford, Conn.
Alex Rode (@arode_lps; arode@ladyard.net), Ledyard Center School, Ledyard, Conn.
Take student learning to new heights. Start your own after-school aerospace program. Find out how to design and create a STEAM/NGSS environment to challenge and inspire students.

Designing Activities for STEM: A Simple Solution for Bundling the CCSS and NGSS
(Grades P–8) 110A, Music City Center
Science Focus: GEN, NGSS
Keith Palz, Distinctive Schools, Chicago, Ill.
Come experience the combination of design thinking and standards bundling as they merge to create interdisciplinary Project-Based Learning activities while drastically increasing collaboration within a team.

Duck, Duck, Goose by the Numbers
(Grades 5–8/College) 201B, Music City Center
Science Focus: ETS, LS
Rebecca Robichaux-Davis (rrr102@msstate.edu), Brian Davis, and Margaret Pope (@marpope; mpope@colled.msstate.edu), and Mississippi State University, Mississippi State, Miss.
Come engage in integrated activities focusing on the annual waterfowl cycle. Participants will solve migration and nesting problems and construct a model wood duck box.

Biomagnification in Ocean Food Webs: You Are What You Eat
(Grades 9–12) 202A, Music City Center
Elizabeth Callaghan (@bethofall; bcallaghan@mbayaq.org), Monterey Bay Aquarium, Monterey, Calif.
Explore the difference between bioaccumulation and biomagnification and learn about a consequence that plastic has on our ocean food web through an engaging simulation activity.

Science and Engineering Practices in the Chemistry Classroom
(Grades 9–College) 202B, Music City Center
Science Focus: PS, SEP
Michael Mury, American Chemical Society, Washington, D.C.
With the NGSS, incorporation of science and engineering practices is vital. Come learn how to integrate these practices into lessons.

Increasing Student Critical Thinking in Evaluating the Credibility of an Information Source
(Grades 9–College) 202C, Music City Center
Science Focus: GEN, SEP1, SEP7, SEP8
Jonathan Fowler (@FowlerSci; fowlerj1@stjohns.edu), St. John’s University, Jamaica, N.Y.
Strengthening critical thinking in an era of hyper-accessible information relies on using credible information sources. Strategies for classroom implementation of these skills will be presented.

Using the Science Writing Heuristic as a Method for Implementing Three-Dimensional Learning
(Grades 6–12) 204, Music City Center
Science Focus: GEN, CCC, SEP
Jennifer Panczyszyn and Heather Witt, K.O. Knudson Middle School, Las Vegas, Nev.
Incorporate three-dimensional learning using the Science Writing Heuristic (SWH), a research-based method of teaching science through inquiry. SWH lessons allow students to develop their initial thoughts, build on them through lab experiences, and challenge them through expert readings. Engage in an SWH lesson, view student work, and begin to develop your own SWH.
Place-Based Engineering  
(Grades K–8)  205A, Music City Center  
Science Focus: ETS, SEP  
Robert Strong (robert@smartcenter.org) and Elizabeth Strong (libby@smartcenter.org), SMART Center, Wheeling, W.Va.  
Engage in engineering activities with examples found in your own backyards! Historical structures, new technologies, and more open the world of engineering to your students.

Explore Rocks Part 2: Sedimentary and Metamorphic Rocks  
(Grades 3–College)  207C, Music City Center  
Science Focus: ESS2.A, CCC1, CCC5, CCC6, SEP3, SEP8  
Davida Buehler (dbuehler@geosociety.org), The Geological Society of America, Boulder, Colo.  
Come see the numerous inquiry-based activities for rocks that you can easily incorporate into your rock unit. They’re sure to engage your students!

11:30 AM–12 Noon  Presentation  
Climate Change: Using Story Maps to Explore Complex Spatial Concepts  
(Grades 9–College)  206 A/B, Music City Center  
Science Focus: ESS  
Meredith McAllister (mlmcalli@butler.edu), Butler University, Indianapolis, Ind.  
Tina Harris (taharris79@yahoo.com), Marion High School, Marion, Ind.  
Geospatial tools, including mapping online, promotes interdisciplinary learning and changes the way students learn to reason about and interpret spatial data related to climate change.
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.

For information and to register, visit www.nsta.org/stemforum
Meetings and Social Functions Index

Saturday, April 2

APAST Breakfast Meeting
By Invitation Only
Broadway K, Omni ............................. 7:00–9:00 AM

NSTA Past Presidents’ Breakfast
By Invitation Only
Legends A, Omni .............................. 7:30–8:15 AM

Science Matters State Coordinators Meeting
By Invitation Only
Music Row 4, Omni .......................... 8:00–9:30 AM

Past Presidents Advisory Board Meeting
Legends A, Omni .............................. 8:15–9:15 AM

Shell Breakfast Meeting
By Invitation Only
Ryman One, Renaissance .................. 8:30–10:00 AM

Teaming Up for STEM: Team Discussion and Planning Meeting
By Invitation Only
Grand Blrm. A1, Music City Center .... 9:00–11:00 AM

AMSE Board Meeting
By Invitation Only
Boardroom 5, Hyatt ........................ 9:00 AM–12 Noon

NSTA International Lounge
Mockingbird 1, Omni ...................... 9:00 AM–5:00 PM

NSTA Committee, Advisory Board, and Panel Chairs Meeting
By Invitation Only
Mockingbird 2, Omni ...................... 9:30–10:30 AM

AMSE General Membership Meeting
Broadway K, Omni .......................... 10:30 AM–12:30 PM

NSTA Council Roundtable
By Invitation Only
Legends A, Omni .............................. 2:00–4:00 PM

CESI Board Meeting
By Invitation Only
Gibson Boardroom, Omni ............... 3:00–6:00 PM

Teacher Scientist Partnerships Reception
Broadway A, Omni .......................... 4:30–6:00 PM

NESTA Annual Membership Meeting
Davidson B, Music City Center .......... 5:00–6:00 PM

LinkEngineering Reception
Legends F, Omni .............................. 6:30–7:30 PM

Boot Scootin’ Boogie!
Off-site, Frontier Room ................. 8:00–10:00 PM
# Index of Exhibitor Workshops

*MCC stands for Music City Center*

## 3D Molecular Designs (Booth #516)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Booth, Location</th>
<th>Workshop Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>12 Noon–1:30 PM</td>
<td>214, MCC</td>
<td>Constructing and Crossing Cell Membranes (p. 55)</td>
</tr>
</tbody>
</table>

## Activate Learning (Booth #1204)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Booth, Location</th>
<th>Workshop Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>8:00–9:30 AM</td>
<td>214, MCC</td>
<td>Discourse Tools for Equitable and Rigorous Talk (p. 27)</td>
</tr>
</tbody>
</table>

## Advancement Courses (Booth #1351)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Booth, Location</th>
<th>Workshop Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>207B, MCC</td>
<td>Using Fables to Scaffold Inquiry-Based STEM Instruction and the Engineering Design Process (p. 40)</td>
</tr>
</tbody>
</table>

## Albert Einstein Distinguished Educator Fellowship (Booth #1535)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Booth, Location</th>
<th>Workshop Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>8:00–9:30 AM</td>
<td>107B, MCC</td>
<td>Albert Einstein Distinguished Educator Fellowship Program: Exciting Opportunities for K–12 STEM Educators to Influence Federal Programs and Policy in Washington, D.C. (p. 23)</td>
</tr>
</tbody>
</table>

## AquaPhoenix Education (Booth #1153)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Booth, Location</th>
<th>Workshop Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>8:00–9:30 AM</td>
<td>209C, MCC</td>
<td>Implementing Three-Dimensional Learning (p. 26)</td>
</tr>
</tbody>
</table>

## Battle Creek Area Mathematics and Science Center (Booth #1143)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Booth, Location</th>
<th>Workshop Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>8:00–9:30 AM</td>
<td>110B, MCC</td>
<td>Cereal City Science: Going Great Lengths Toward the NGSS (p. 24)</td>
</tr>
</tbody>
</table>

## Bedford, Freeman, & Worth Publishers (Booth #744)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Booth, Location</th>
<th>Workshop Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>8:00–9:30 AM</td>
<td>210, MCC</td>
<td><em>Living By Chemistry</em>: Pass the Proton—Acids and Bases (p. 26)</td>
</tr>
</tbody>
</table>

## Bio-Rad Laboratories, Inc. (Booth #152)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Booth, Location</th>
<th>Workshop Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>8:00–9:30 AM</td>
<td>208A, MCC</td>
<td>Get that Grant Money! (p. 26)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00 –11:30 AM</td>
<td>208A, MCC</td>
<td>NGSS in the High School Biology Classroom (p. 40)</td>
</tr>
</tbody>
</table>

## BIOZONE International Ltd. (Booth #840)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Booth, Location</th>
<th>Workshop Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>202B, MCC</td>
<td>Earth and Space Sciences for NGSS: A New Program (Grades 9–12) (p. 39)</td>
</tr>
</tbody>
</table>

## Carolina Biological Supply Co. (Booth #118)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Booth, Location</th>
<th>Workshop Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>8:00–9:30 AM</td>
<td>205B, MCC</td>
<td>Interactive Case Studies: Supplemental Software to Improve Critical Thinking in the Biology Classroom (p. 24)</td>
</tr>
</tbody>
</table>

## Celestron (Booth #1218)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Booth, Location</th>
<th>Workshop Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>108, MCC</td>
<td>Stretch Your Legs for Science! (p. 38)</td>
</tr>
<tr>
<td>Exhibitor</td>
<td>Booth #</td>
<td>Date/Time</td>
<td>Room, MCC</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------------</td>
<td>---------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Chibitronics</td>
<td>#1344</td>
<td>Saturday, Apr 2 8:00–9:30 AM</td>
<td>208B, MCC</td>
</tr>
<tr>
<td>Disney Youth Programs</td>
<td>#844</td>
<td>Saturday, Apr 2 10:00–11:30 AM</td>
<td>212, MCC</td>
</tr>
<tr>
<td>Educational Innovations, Inc.</td>
<td>#1026/ #1126</td>
<td>Saturday, Apr 2 10:00–11:30 AM</td>
<td>202A, MCC</td>
</tr>
<tr>
<td>ETA hand2mind</td>
<td>#408</td>
<td>Saturday, Apr 2 12 Noon–1:30 PM</td>
<td>208B, MCC</td>
</tr>
<tr>
<td>Flinn Scientific, Inc.</td>
<td>#333</td>
<td>Saturday, Apr 2 10:00–11:30 AM</td>
<td>209A, MCC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Saturday, Apr 2 12 Noon–1:30 PM</td>
<td>209A, MCC</td>
</tr>
<tr>
<td>G-Biosciences</td>
<td>#1005</td>
<td>Saturday, Apr 2 8:00–9:30 AM</td>
<td>212, MCC</td>
</tr>
<tr>
<td>Houghton Mifflin Harcourt</td>
<td>#1240</td>
<td>Saturday, Apr 2 8:00–9:30 AM</td>
<td>202B, MCC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Saturday, Apr 2 12 Noon–1:30 PM</td>
<td>202B, MCC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Saturday, Apr 2 12:00–3:30 PM</td>
<td>202B, MCC</td>
</tr>
<tr>
<td>Inq-ITS</td>
<td>#1336</td>
<td>Saturday, Apr 2 8:00–9:30 AM</td>
<td>202C, MCC</td>
</tr>
<tr>
<td>Kendall Hunt Publishing Co.</td>
<td>#515</td>
<td>Saturday, Apr 2 8:00–9:30 AM</td>
<td>206 A/B, MCC</td>
</tr>
<tr>
<td>LAB-AIDS®, Inc.</td>
<td>#915</td>
<td>Saturday, Apr 2 8:00–9:30 AM</td>
<td>205C, MCC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Saturday, Apr 2 10:00–11:30 AM</td>
<td>205C, MCC</td>
</tr>
</tbody>
</table>
## Index of Exhibitor Workshops

### LaMotte Co. (Booth #1015)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>8:00–9:30 AM</td>
<td>107A, MCC</td>
<td>AP Environmental: Using Your Stream to Teach STEM-Based Skills (p. 23)</td>
</tr>
</tbody>
</table>

### LEGO Education (Booths #341 / #358)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>211, MCC</td>
<td>Make Science Come to Life (p. 42)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>12 Noon–1:30 PM</td>
<td>211, MCC</td>
<td>Make Science Come to Life (p. 55)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>2:00–3:30 PM</td>
<td>211, MCC</td>
<td>Make Science Come to Life (p. 75)</td>
</tr>
</tbody>
</table>

### McDowell Farm School (Booth #948)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>110B, MCC</td>
<td>McDowell Farm School: Integrating Best Practices in a Scientific Garden (p. 39)</td>
</tr>
</tbody>
</table>

### McGraw-Hill Education (Booth #1345)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>8:00–9:30 AM</td>
<td>201B, MCC</td>
<td>Engagement Unlocked! Using Learning Games for STEM (p. 24)</td>
</tr>
</tbody>
</table>

### Measured Progress (Booth #304)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>8:00–9:30 AM</td>
<td>209B, MCC</td>
<td>Engage with NGSS Using STEM Gauge™ (p. 26)</td>
</tr>
</tbody>
</table>

### Microsoft (Booth #1335)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>8:00–9:30 AM</td>
<td>110A, MCC</td>
<td>Development of a Science Maker Kit for Inquiry-Based Teaching: Ideation and Feedback (p. 23)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>110A, MCC</td>
<td>Understanding the Community Impact of Environmental Hazards: Developing a Project-Based Learning Challenge from Start to Finish Using Microsoft Tools (p. 38)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>1:00–2:30 PM</td>
<td>110A, MCC</td>
<td>Getting to Know the Creative Coding Through Games and Apps (CCGA) Course Content (p. 65)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>3:00–4:30 PM</td>
<td>110A, MCC</td>
<td>The Differentiated Classroom in One Package: Teaching Science Inquiry to Modern Learners Using Microsoft Surface and Apps (p. 77)</td>
</tr>
</tbody>
</table>

### MSOE Center for BioMolecular Modeling (Booth #518)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>214, MCC</td>
<td>Let’s Get Helical (p. 42)</td>
</tr>
</tbody>
</table>

### Nano-Link: Center for Nanotechnology Education (Booth #1354)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>12 Noon–1:30 PM</td>
<td>201B, MCC</td>
<td>Learning Through Hands-On Activities (p. 53)</td>
</tr>
</tbody>
</table>

### National Agriculture in the Classroom (Booth #1113)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>8:00–9:30 AM</td>
<td>108, MCC</td>
<td>Contextualizing Science Literacy with Agriculture (p. 23)</td>
</tr>
</tbody>
</table>

### National Geographic Education (Booths #749)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>208B, MCC</td>
<td>National Geographic Educator Certification Program (p. 41)</td>
</tr>
</tbody>
</table>
### Index of Exhibitor Workshops

#### NOAA Ocean Service (Booth #1423)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Session Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>9:00–10:30 AM</td>
<td>201A, MCC</td>
<td>Climate Change Series I: Polar Popsicles—Life in the Ice (p. 30)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>10:45–11:45 AM</td>
<td>201A, MCC</td>
<td>Climate Change Series II: Bringing Climate Change Closer to Home: U.S. Forest Service Climate Change Education Resources (p. 43)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>12:15–1:15 PM</td>
<td>201A, MCC</td>
<td>Climate Change Series III: ClimateChangeLIVE: Engage Your Students in Learning and Being Part of the Climate Solution! (p. 56)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>1:30–2:30 PM</td>
<td>201A, MCC</td>
<td>Climate Change Series IV: NOAA Climate Stewards (p. 66)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>2:45–3:45 PM</td>
<td>201A, MCC</td>
<td>Climate Change Series V: Use NGSS as a Pathway to Climate Literacy (p. 77)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>4:00–5:00 PM</td>
<td>201A, MCC</td>
<td>Climate Change Series VI: Climate Games and Simulations (p. 84)</td>
</tr>
</tbody>
</table>

#### Northrop Grumman Foundation (Booth #442)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Session Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>2:00–3:30 PM</td>
<td>208B, MCC</td>
<td>ECO Classroom: Free Experiential Learning in the Rainforests of Costa Rica (p. 74)</td>
</tr>
</tbody>
</table>

#### Perimeter Institute for Theoretical Physics (Booth #1219)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Session Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>107B, MCC</td>
<td>The Expanding Universe (p. 38)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>12 Noon–1:30 PM</td>
<td>107B, MCC</td>
<td>Spicing Up Classical Physics Using Modern Examples (p. 53)</td>
</tr>
</tbody>
</table>

#### PlayMada Games (Booth #1434)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Session Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>206 A/B, MCC</td>
<td>Collisions™: Reconceptualizing Chemistry Through Gameplay (p. 40)</td>
</tr>
</tbody>
</table>

#### SAE International—A World In Motion Program (Booth #609)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Session Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>12 Noon–1:30 PM</td>
<td>209C, MCC</td>
<td>SAE Middle School Educational Offerings (p. 54)</td>
</tr>
</tbody>
</table>

#### Shape of Life (Booth #1121)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Session Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>209C, MCC</td>
<td>The REAL Story of the Animal Kingdom on Planet Earth (p. 42)</td>
</tr>
</tbody>
</table>

#### Simulation Curriculum Corp. (Booth #834)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Session Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>209B, MCC</td>
<td>Life Cycle of Stars: From Birth to Catastrophic Death (p. 42)</td>
</tr>
</tbody>
</table>

#### Society for Neuroscience (Booth #301)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Session Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>201B, MCC</td>
<td>The Truth Behind Brain-Based Learning (p. 39)</td>
</tr>
</tbody>
</table>

#### Stratasys (Booth #300)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Session Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>204, MCC</td>
<td>Implementing 3D Printing Across the K–12 Curriculum (p. 39)</td>
</tr>
</tbody>
</table>

#### Teachers Curriculum Institute (Booth #256)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Session Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>107A, MCC</td>
<td>Modeling Earth, Sun, and Other Stars with Bring Science Alive! (p. 38)</td>
</tr>
</tbody>
</table>
### Index of Exhibitor Workshops

#### Texas Instruments (Booth #108)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room</th>
<th>Workshop Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>8:00–9:30 AM</td>
<td>207B, MCC</td>
<td>Zombie Apocalypse! (p. 25)</td>
</tr>
</tbody>
</table>

#### U.S. Fish and Wildlife Service (Booth #1316)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room</th>
<th>Workshop Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>210, MCC</td>
<td>Engaging Your Students Through the U.S. Fish &amp; Wildlife Service’s Conservation Connect (p. 42)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>12 Noon–1:30 PM</td>
<td>210, MCC</td>
<td>Citizen Science—From Classroom to Field with the U.S. Fish and Wildlife Service (p. 54)</td>
</tr>
</tbody>
</table>

#### Van Andel Education Institute Science Academy (Booth #706)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room</th>
<th>Workshop Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>202C, MCC</td>
<td>No Great Science Student (NGSS) Left Behind with NexGen Inquiry™ (p. 39)</td>
</tr>
</tbody>
</table>

#### Vernier Software & Technology (Booth #134)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room</th>
<th>Workshop Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>8:00–9:30 AM</td>
<td>207D, MCC</td>
<td>Integrating Chromebook with Vernier Technology (p. 26)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>8:00–9:30 AM</td>
<td>207C, MCC</td>
<td>Chemistry with Vernier (p. 26)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>207C, MCC</td>
<td>Inquiry-Based Chemistry with Vernier (p. 40)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>207D, MCC</td>
<td>Elementary Science with Vernier (p. 40)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>12 Noon–1:30 PM</td>
<td>207C, MCC</td>
<td>Biology with Vernier (p. 54)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>12 Noon–1:30 PM</td>
<td>207D, MCC</td>
<td>Physics with Vernier (p. 54)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>2:00–3:30 PM</td>
<td>207C, MCC</td>
<td>Human Physiology with Vernier (p. 74)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>2:00–3:30 PM</td>
<td>207D, MCC</td>
<td>Introductory Engineering Design Projects with Vernier (p. 74)</td>
</tr>
</tbody>
</table>

#### Ward’s Science (Booth #142)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room</th>
<th>Workshop Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, Apr 2</td>
<td>8:00–9:30 AM</td>
<td>207A, MCC</td>
<td>Vampire Chronicles: Sink Your Teeth into Genetics and Blood Typing (p. 25)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>10:00–11:30 AM</td>
<td>207A, MCC</td>
<td>Grant Writing: Pipelines, Partnerships, and Finding Funding (p. 40)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>12 Noon–1:30 PM</td>
<td>207A, MCC</td>
<td>Let Motion Show How Cars May Really Drive Themselves in the Future with the ERGOBOT! (p. 54)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>2:00–3:30 PM</td>
<td>207A, MCC</td>
<td>Elementary Science Activity Jamboree (p. 74)</td>
</tr>
<tr>
<td>Saturday, Apr 2</td>
<td>4:00–5:30 PM</td>
<td>207A, MCC</td>
<td>Physics of Music (p. 84)</td>
</tr>
</tbody>
</table>
### Earth and Space Science: Saturday

<table>
<thead>
<tr>
<th>Time</th>
<th>Room</th>
<th>Session Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>4–6</td>
<td>104C, MCC</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>K–5</td>
<td>Music Row S, Omni</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>K–8</td>
<td>104E, MCC</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>5–8</td>
<td>Broadway C, Omni</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>K–12</td>
<td>Legends G, Omni</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–8</td>
<td>106C, MCC</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–8</td>
<td>Broadway D, Omni</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>K–12</td>
<td>Electric, Omni</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>4–10</td>
<td>103C, MCC</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–C</td>
<td>103B, MCC</td>
</tr>
<tr>
<td>8:00–9:30 AM</td>
<td>6–8</td>
<td>202C, MCC</td>
</tr>
<tr>
<td>8:00–9:30 AM</td>
<td>6–8</td>
<td>205C, MCC</td>
</tr>
<tr>
<td>8:00–9:30 AM</td>
<td>12</td>
<td>107A, MCC</td>
</tr>
<tr>
<td>8:30–9:00 AM</td>
<td>P–C</td>
<td>Acoustic, Omni</td>
</tr>
<tr>
<td>9:00–10:30 AM</td>
<td>6–12</td>
<td>201A, MCC</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>*–C</td>
<td>101E, MCC</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>7–C</td>
<td>105A, MCC</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–8</td>
<td>106C, MCC</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>G</td>
<td>104A, MCC</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>3–C</td>
<td>Electric, Omni</td>
</tr>
<tr>
<td>9:30–11:00 AM</td>
<td>P–C</td>
<td>Davidson C, MCC</td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>6–12</td>
<td>209B, MCC</td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>K–8</td>
<td>107A, MCC</td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>9–12</td>
<td>202B, MCC</td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>7–12</td>
<td>110A, MCC</td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>9</td>
<td>107B, MCC</td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>K–12</td>
<td>108, MCC</td>
</tr>
<tr>
<td>10:45–11:45 AM</td>
<td>6–12</td>
<td>201A, MCC</td>
</tr>
<tr>
<td>11:00–11:30 AM</td>
<td>5–8</td>
<td>Broadway C, Omni</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>9–12</td>
<td>Broadway G, Omni</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>5–C</td>
<td>Center Blrm., Renaissance</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>1–8</td>
<td>Davidson A2/3, MCC</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>6–8</td>
<td>106C, MCC</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>6–12</td>
<td>103A, MCC</td>
</tr>
</tbody>
</table>
### Schedule at a Glance  
**Earth and Space Science**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00 AM–12 Noon</td>
<td>P–C</td>
<td>Grand Blmr. C2, MCC</td>
<td>American Geophysical Union (AGU) Lecture: Curiosity’s Adventures in Gale Crater, Mars (p. 45)</td>
</tr>
<tr>
<td>12 Noon–1:30 PM</td>
<td>6–8</td>
<td>209A, MCC</td>
<td>Hands-On Integrated Science Activities for Middle School from Flinn Scientific (p. 54)</td>
</tr>
<tr>
<td>12 Noon–1:30 PM</td>
<td>5–C</td>
<td>214, MCC</td>
<td>Constructing and Crossing Cell Membranes (p. 55)</td>
</tr>
<tr>
<td>12:15–1:15 PM</td>
<td>6–12</td>
<td>201A, MCC</td>
<td>Climate Change Series III: ClimateChangeLIVE: Engage Your Students in Learning and Being Part of the Climate Solution! (p. 56)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–C</td>
<td>Legends F, Omni</td>
<td>Modeling in STEM Education with Examples from Climate Modeling (p. 63)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>P–12</td>
<td>101 A/B, MCC</td>
<td>NASA Aeronautics 101: Over a Century of Flight (p. 61)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–C</td>
<td>Davidson B, MCC</td>
<td>NESTA and CIESIN Share: Exploring a Compendium of Online Resources for Teaching Earth Science (p. 60)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>P–5</td>
<td>105A, MCC</td>
<td>Planting a School Garden on a Shoestring Budget (p. 62)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>P–8</td>
<td>Music Row 2, Omni</td>
<td>AMSE Session: Differentiating Instruction to Help All Students Reach Their Potential (p. 61)</td>
</tr>
<tr>
<td>1:00–1:30 PM</td>
<td>K–C</td>
<td>Cumberland 4, Omni</td>
<td>Educating for Ecological Identity (p. 64)</td>
</tr>
<tr>
<td>1:15–1:45 PM</td>
<td>4–10</td>
<td>Broadway A, Omni</td>
<td>Meet Me in the Middle Session: Earworms and Melodies: Teaching Science Through Songs (p. 66)</td>
</tr>
<tr>
<td>1:30–2:30 PM</td>
<td>K–12</td>
<td>201A, MCC</td>
<td>Climate Change Series IV: NOAA Climate Stewards (p. 66)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>K–C</td>
<td>Davidson B, MCC</td>
<td>National Earth Science Teachers Association (NESTA) Shares: Atmosphere and Ocean Share-a-Thon (p. 72)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>4–12</td>
<td>Cumberland 4, Omni</td>
<td>Freshwater Stewardship: Equip Your Student-Scientists with Cutting-Edge Resources from NOAA (p. 70)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>1–C</td>
<td>Legends C, Omni</td>
<td>Nano Days and Nights (p. 72)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>6–C</td>
<td>105A, MCC</td>
<td>Investigating the New Madrid Seismic Zone: New Science from Earthscope and Illustrative Physical Models for the Classroom (p. 68)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>6–8</td>
<td>106A, MCC</td>
<td>GeoTeach: Engaging Middle School Students in Inquiry and Engineering-based Earth Science (p. 68)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>7–12</td>
<td>Music Row 2, Omni</td>
<td>Using Machine Learning to Measure Learning Progressions and Inform Instruction (p. 71)</td>
</tr>
<tr>
<td>2:00–3:30 PM</td>
<td>1–6</td>
<td>207A, MCC</td>
<td>Elementary Science Activity Jamboree (p. 74)</td>
</tr>
<tr>
<td>2:45–3:45 PM</td>
<td>6–12</td>
<td>201A, MCC</td>
<td>Climate Change Series V: Use NGSS as a Pathway to Climate Literacy (p. 77)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12</td>
<td>Cumberland 1, Omni</td>
<td>Differentiating Content, Process, and Product: Examples from Earth History, Ecology, Force and Motion, and Astronomy Units (p. 80)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>P–8</td>
<td>103B, MCC</td>
<td>Connecting Scientists from the Past with Scientists in Our Classrooms: Linking Place-Based Science and Culture (p. 82)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12</td>
<td>106A, MCC</td>
<td>Climate Studies with Global Hawk and NASA Airborne Science (p. 78)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>4–C</td>
<td>Davidson B, MCC</td>
<td>National Earth Science Teachers Association (NESTA) Shares: Innovative Ways to Teach About Weather Observation and Weather Hazards (p. 83)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>P–5</td>
<td>104D, MCC</td>
<td>Three-Dimensional Learning of Space Systems Across Elementary Grade Bands (p. 82)</td>
</tr>
<tr>
<td>4:00–5:00 PM</td>
<td>6–12</td>
<td>201A, MCC</td>
<td>Climate Change Series VI: Climate Games and Simulations (p. 84)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>6–12</td>
<td>103B, MCC</td>
<td>Space Station Explorers (p. 86)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>4–9</td>
<td>Music Row 3, Omni</td>
<td>What Happens When the Train Runs Off the Tracks? A Problem-Based Learning Module (p. 87)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>3–C</td>
<td>105A, MCC</td>
<td>Explore Rocks Part 1: Rock Cycle and Igneous Rocks (p. 88)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>6–12</td>
<td>Davidson A2/3, MCC</td>
<td>Glaciers: Traveling Time Capsules (p. 86)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>9–12</td>
<td>106B, MCC</td>
<td>Teaching the High School NGSS Disciplinary Core Ideas: Earth Systems and Human Sustainability Using Real Earthquake Location Data (p. 88)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>4–10</td>
<td>Fisk Two, Renaissance</td>
<td>The Argumentation Toolkit: The Lawrence Hall of Science Presents a Collection of Multimedia Resources to Support Teacher Learning About Argumentation (p. 90)</td>
</tr>
</tbody>
</table>

### Earth and Space Science: Sunday

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>4–8</td>
<td>105B, MCC</td>
<td>Climate Science: How Can Such a Serious Topic Be so Much Fun?! (p. 97)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>7–12</td>
<td>205A, MCC</td>
<td>Science Is a Social Endeavor: Scientific Inquiry Through Collaborative Work (p. 97)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>9–12</td>
<td>207C, MCC</td>
<td>Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events (p. 94)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>4–C</td>
<td>207D, MCC</td>
<td>Your Ecological Footprint in a 3D NGSS Classroom (p. 97)</td>
</tr>
</tbody>
</table>
Schedule at a Glance  Earth and Space Science

9:30–10:30 AM  4–C 207C, MCC  Exploring Earth Science: Hands-On NGSS-Based Investigations from the Exploratorium (p. 104)
9:30–10:30 AM  9–12 105A, MCC  Cheap Investigations…Priceless Student Learning (p. 102)
9:30–10:30 AM  8–C 201B, MCC  Examining the Evidence: Using Data to Pose and Answer Questions around Earth’s Changing Climate (p. 102)
9:30–10:30 AM  5–8 205C, MCC  Moon “Face” Model (p. 100)
9:30–10:30 AM  3–9 205A, MCC  Drill into the Past with the International Ocean Discovery Program (p. 104)
9:30–10:30 AM  8–C 201B, MCC  Examining the Evidence: Using Data to Pose and Answer Questions around Earth’s Changing Climate (p. 102)
9:30–10:30 AM  3–10 209C, MCC  Learning about Earth’s Hydrosphere Using STEAM Skills! (p. 104)
9:30–10:30 AM  3–9 205A, MCC  Drill into the Past with the International Ocean Discovery Program (p. 104)
9:30–10:30 AM  9–C 101E, MCC  Using-Web-Based Resources to Assist Diverse Learners to Learn Scientific Concepts While Engaging in Science Practices (p. 104)
11:00–11:30 AM  9–C 206 A/B, MCC  Using Eclipses to Teach the Evolution of Astronomy (p. 105)
11:00 AM–12 Noon  3–C 207C, MCC  Explore Rocks Part 2: Sedimentary and Metamorphic Rocks (p. 105)
11:00 AM–12 Noon  10–12 109, MCC  Geospatial Technology and Its Applications (p. 105)
11:00 AM–12 Noon  6–12 106A, MCC  Climate Change Research on the Arctic Tundra: Lessons and Labs from a Teacher at Toolik Field Station in Alaska (p. 106)
11:00 AM–12 Noon  3–8 105B, MCC  Aerospace Adventurers: Launching an After-School Aeronautics and Space Education Program (p. 109)
11:30 AM–12 Noon  9–C 206 A/B, MCC  Climate Change: Using Story Maps to Explore Complex Spatial Concepts (p. 110)

Engineering, Technology, and the Application of Science: Saturday

8:00–9:00 AM  K–5 Music Row 5, Omni  Earthquake! Integrating CCSS and NGSS in the Elementary Science and Engineering Classroom (p. 22)
8:00–9:00 AM  4–12 Davidson A2/3, MCC  Scientists for Tomorrow: An Initiative to Promote STEM in Out-of-School-Time Frameworks (p. 96)
8:00–9:00 AM  9–12 207C, MCC  Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events (p. 94)
8:00–9:00 AM  4–8 101 A/B, MCC  STEMulate Student Learning by Infusing Engineering Design Using the 6 Es (p. 20)
8:00–9:00 AM  2–8/C Broadway H, Omni  Design Engineering with Young Learners Using Edible Lunar Vehicles (p. 18)
8:00–9:00 AM  7–12 Music City Blrm., Renaissance CEEMS: Challenge-Based Learning Units Incorporating Engineering Design with Secondary Science and Math Content (p. 19)
8:00–9:00 AM  K–12 Legends G, Omni  Science Explorations with Deaf and Hard of Hearing Students (p. 22)
8:00–9:00 AM  9–12 101D, MCC  NSTA Press® Session: Integrating Engineering Practices into a Whole-Class Inquiry Challenge (p. 17)
8:00–9:30 AM  6–8 202B, MCC  Self-Propelled Vehicles! Constructing Engaging Engineering Experiences Using NGSS Performance Expectations (p. 24)
8:30–9:00 AM  P–C Acoustic, Omni  Smithsonian National Air and Space Museum Exhibits as Sources for STEM Investigations (p. 28)
8:00–9:30 AM  12 107A, MCC  AP Environmental: Using Your Stream to Teach STEM-Based Skills (p. 23)
9:30–10:00 AM  K–1/C Music City Blrm., Renaissance Primary Students and Teachers Practicing Authentic Engineering Practices: Look, Draw, Build, and Do It Again! (p. 30)
9:30–10:00 AM  3–10 Legends B, Omni  Games in Science! How to Use Them Effectively! (p. 36)
9:30–10:30 AM  *–C 101E, MCC  Students Answer Sustainable Energy Research Questions with Current Science and Engineering Data (p. 35)
9:30–10:30 AM  1–12 Music Row 2, Omni  STEM Teacher Liability: Walking on the Safer Side! (p. 34)
9:30–10:30 AM  6–12 103A, MCC  Engineering Remotely Operated Vehicles Incorporates Three-Dimensional Learning to Improve Student Achievement (p. 31)
9:30–10:30 AM  3–C Electric, Omni  ICARUS (p. 34)
<table>
<thead>
<tr>
<th>Time</th>
<th>Room</th>
<th>Presenter(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30–10:30 AM</td>
<td>K–8</td>
<td>Davidson A2/3, MCC</td>
<td>Old Dog, New Tricks: Transitioning to Engineering and Design Challenges (p. 32)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>1–5</td>
<td>104C, MCC</td>
<td>Meaningful Integration Between STEM Subjects in the Elementary Classroom (p. 35)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>9–12</td>
<td>Music Row 1, Omni</td>
<td>Engage with Engineering: Preparing a Science Department to Integrate Engineering Practices into its Courses (p. 34)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>3–C</td>
<td>Center Blrm., Renaissance</td>
<td>Augmented Science (p. 36)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>1–9</td>
<td>104E, MCC</td>
<td>Bringing Engineering, Technology, and Applications of Science into the Elementary and Middle School Classroom (p. 35)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>3–9</td>
<td>205A, MCC</td>
<td>Drill into the Past with the International Ocean Discovery Program (p. 104)</td>
</tr>
<tr>
<td>9:30–11:30 AM</td>
<td>K–12</td>
<td>Broadway J, Omni</td>
<td>AMSE Session: George W. Carver Conversations Series on Diversity and Equity (p. 38)</td>
</tr>
<tr>
<td>9:30–11:30 AM</td>
<td>K–12</td>
<td>207B, MCC</td>
<td>Using Fables to Scaffold Inquiry-Based STEM Instruction and the Engineering Design Process (p. 40)</td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>6–12</td>
<td>212, MCC</td>
<td>A Peek Behind the Curtain: Disney Parks Approach to Physics and Energy (p. 42)</td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>8–C</td>
<td>214, MCC</td>
<td>Let's Get Helical! (p. 42)</td>
</tr>
<tr>
<td>10:15–10:45 AM</td>
<td>5–9</td>
<td>Broadway C, Omni</td>
<td>Meet Me in the Middle Session: Everyday Engineering (p. 43)</td>
</tr>
<tr>
<td>11:00–11:30 AM</td>
<td>5–8</td>
<td>Broadway C, Omni</td>
<td>Meet Me in the Middle Session: More Engineering to the Standards (p. 45)</td>
</tr>
<tr>
<td>11:00–11:30 AM</td>
<td>3–8</td>
<td>106A, MCC</td>
<td>Robotics Project for Elementary and Middle Grades Preservice Teachers (p. 44)</td>
</tr>
<tr>
<td>12 Noon–1:30 PM</td>
<td>P–5</td>
<td>208B, MCC</td>
<td>From “Science Is for Others” to “Science Is for Me”—Hands-On Modules to Engage All Students (p. 54)</td>
</tr>
<tr>
<td>12 Noon–1:30 PM</td>
<td>6–8</td>
<td>Cumberland D, Omni</td>
<td>Meet Me in the Middle Session: Engineering Practice in Middle School Chemistry (p. 58)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–12</td>
<td>Cumberland 5, Omni</td>
<td>Gender Equitable Teaching Strategies for Engaging Girls in Engineering and Technology Pathways (p. 57)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>8–12</td>
<td>Music Row 1, Omni</td>
<td>Chemical Action-based Curriculum (p. 57)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>5–9</td>
<td>103A, MCC</td>
<td>Warm the Water to Save Your City: An Engineering and Educational Technology NGSS Student Assessment Task (p. 56)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>3–C</td>
<td>Center Blrm., Renaissance</td>
<td>Exploring Light and Color: Hands-On NGSS-Based Investigations from the Exploratorium (p. 64)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>7–12</td>
<td>Legends A, Omni</td>
<td>Smart Switches (p. 62)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>104D, MCC</td>
<td>A Way with Words: Integrating Science, Engineering, and ELA in Elementary Classrooms (p. 62)</td>
<td></td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>K–6/C</td>
<td>103C, MCC</td>
<td>Lead with Science: Learn How to Use Science Tasks to Reinforce CCSS for ELA and Mathematics (p. 62)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–12</td>
<td>Cumberland 2, Omni</td>
<td>Meeting the NGSS...Even When You Don’t Have To (p. 60)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–12</td>
<td>Broadway H, Omni</td>
<td>Dive into Engineering Design: Connecting Physical Science and Engineering Through Underwater Robotics (p. 60)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–12</td>
<td>106A, MCC</td>
<td>DIY: Solar Panels (p. 58)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>K–12</td>
<td>West Blrm., Renaissance</td>
<td>Three Dimensions, Vertical Alignment, and STEM: Sequential Skill Building for Student Success (p. 61)</td>
</tr>
<tr>
<td>1:00–1:30 PM</td>
<td>9–12</td>
<td>Cumberland 3, Omni</td>
<td>Robotics in the Classroom (p. 64)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>K–5</td>
<td>104D, MCC</td>
<td>STEM: Not Just Another Thing... (p. 71)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>4–C</td>
<td>Legends B, Omni</td>
<td>Capturing Engineering Design and Process in Youth Portfolios (p. 72)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>K–12</td>
<td>Broadway G, Omni</td>
<td>App and at ’em: Using Technology in Professional Development (p. 70)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>5–C</td>
<td>Fisk Two, Renaissance</td>
<td>Design Thinking: A Creative Engineering Approach to Problem Solving (p. 71)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>6–8</td>
<td>106C, MCC</td>
<td>This Efficient House (p. 72)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>6–8</td>
<td>106A, MCC</td>
<td>GeoTeach: Engaging Middle School Students in Inquiry and Engineering-based Earth Science (p. 68)</td>
</tr>
<tr>
<td>2:00–3:30 PM</td>
<td>6–12</td>
<td>207D, MCC</td>
<td>Introductory Engineering Design Projects with Vernier (p. 74)</td>
</tr>
</tbody>
</table>
Schedule at a Glance | Engineering, Technology, and the Application of Science

2:00–3:30 PM 3–5 202B, MCC Wind Turbines and Fruit Batteries! Constructing Engaging Engineering Experiences Using NGSS Performance Expectations (p. 74)
3:30–4:30 PM P–6 106B, MCC Keeping Things in Motion using NASA and Newton’s Laws (p. 83)
3:30–4:30 PM 5–8 105B, MCC Using the Tools of the NGSS to Reach Girls in Science (p. 82)
3:30–4:30 PM 9–12 Cumberland 5, Omni From the Love Canal to Phytoremediation: What’s New in Environmental Engineering? (p. 80)
5:00–6:00 PM P–3 104A, MCC We Are Engineers, Too! (p. 86)
5:00–6:00 PM P–8 106A, MCC The Maker Movement in EC–Grade 8 Classrooms (p. 86)
5:00–6:00 PM 4–9 Music Row 3, Omni What Happens When the Train Runs Off the Tracks? A Problem-Based Learning Module (p. 87)
5:00–6:00 PM P–12 Legends C, Omni Introduction to LinkEngineering (p. 88)
5:00–6:00 PM P–2 104C, MCC Ramps and Pathways: An Integrated STEM Activity (p. 88)

Engineering, Technology, and the Application of Science: Sunday

8:00–9:00 AM 7–12 206 A/B, MCC Teach Engineering Principles on the Cheap with Concrete (p. 94)
8:00–9:00 AM K–5 104E, MCC Engineering Through Children’s Literature (p. 96)
8:00–9:00 AM 3–5 104C, MCC A Beginner’s Guide to Engineering Design Challenge (p. 96)
9:30–10:00 AM 4–8 106A, MCC Let’s Explore: The Changes That Surround Us (p. 98)
9:30–10:30 AM 6–C 207D, MCC Science Teaching for Social Justice (p. 100)
9:30–10:30 AM 6–12 208B, MCC “Pitching“ Student Innovation and Community Building Through Shark Tank (p. 100)
9:30–10:30 AM P–1 110A, MCC Engineering for Kindergartners? You Bet! (p. 102)
9:30–10:30 AM 7–12 208B, MCC From Silos to STEM: Developing Real Thinkers (p. 104)
9:30–10:30 AM 9–12 Davidson A2/3, MCC Cheap STEM Lessons for the Classroom (p. 101)
11:00 AM–12 Noon 6–12 106A, MCC Climate Change Research on the Arctic Tundra: Lessons and Labs from a Teacher at Toolik Field Station in Alaska (p. 106)
11:00 AM–12 Noon 8–12 207A, MCC Bring the Science of Cars into the Classroom Basic (p. 106)
11:00 AM–12 Noon 6–12 Davidson A2/3, MCC Duck, Duck, Goose by the Numbers (p. 109)
11:00 AM–12 Noon 5–8/C 201B, MCC Ocean Robotics in a Landlocked 1:1 STEM Classroom (p. 108)
11:00 AM–12 Noon K–8 205A, MCC Place-Based Engineering (p. 110)
11:00 AM–12 Noon 10–12 109, MCC Geospatial Technology and Its Applications (p. 105)
11:00 AM–12 Noon 3–8 105B, MCC Aerospace Adventurers: Launching an After-School Aeronautics and Space Education Program (p. 109)

General Science Education: Saturday

8:00–8:30 AM 1–C Broadway B, Omni STEM Partnerships Among All Levels: Bringing It All Together (p. 16)
8:00–8:30 AM 5–8 Davidson A2/3, MCC The Vanderbilt Scientist-Teacher Collaborative Apprenticeship: Enhancing Science Teaching and Learning in Middle Schools (p. 15)
8:00–8:30 AM 3–12 Broadway G, Omni Differentiated Instruction through Technology-based Menus (p. 16)
8:00–8:30 AM 4–10 Cumberland 2, Omni Noticing Phenomena or Everyone Knows What a Zebra Looks Like (p. 16)
8:00–9:00 AM K–12 Legends C, Omni Creating a Real-World Experience for All Students in STEM (p. 22)
8:00–9:00 AM 7–12 Legends B, Omni Why Can’t I Be Michael Jordan? A Planning Tool for Designing Engaging NGSS-Focused Science Units (p. 22)
8:00–9:00 AM 4–6 104C, MCC To the Moon and Back (p. 20)
8:00–9:00 AM K–12 104A, MCC The NGSS@NSTA Hub (p. 18)
8:00–9:00 AM 4–C Music Row 2, Omni AMSE Session: Opportunities to Improve Equity in Your Classroom (p. 19)
8:00–9:00 AM K–5 101C, MCC NSTA Press® Session: Picture-Perfect Science Lessons: Using Picture Books to Guide Inquiry, K–5 (p. 20)
## Schedule at a Glance
### General Science Education

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>9–12</td>
<td>Music Row 1, Omni</td>
<td>Student-Driven Research Projects in a High School Science Classroom (p. 19)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>5–12</td>
<td>Center Blrm., Renaissance</td>
<td>Paul George’s Injury: The Impact of Whole Class Modeling on Discussion (p. 23)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–12</td>
<td>Legends E, Omni</td>
<td>The Lab-O-Matic: Meet Your Classroom’s New Best Friend (p. 22)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>4–12</td>
<td>West Blrm., Renaissance</td>
<td>Project-Based Learning: Curriculum Design and Integration Strategies that Address NGSS and CCSS (p. 20)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>5–9</td>
<td>Mockingbird 2, Omni</td>
<td>Formative Assessments and the NGSS (p. 19)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–12</td>
<td>Cumberland 1, Omni</td>
<td>Teacher’s Guide to Technical Writing for STEM: Proposals, Plans, and Reports (p. 18)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>4–12</td>
<td>Cumberland 5, Omni</td>
<td>Using Young Adult Literature to Support Content Learning and Reading Comprehension in the Science Classroom (p. 18)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–12</td>
<td>Mockingbird 4, Omni</td>
<td>CCSS + NGSS = Science Fair (p. 19)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–C</td>
<td>Legends F, Omni</td>
<td>Crunching the Numbers: Novel Ways to Implement Graphing and Data Analysis into Your Curriculum (p. 22)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>K–12</td>
<td>Legends D, Omni</td>
<td>BSCS Pathway Session: Taking the Lead with the NGSS (p. 22)</td>
</tr>
<tr>
<td>8:00–9:30 AM</td>
<td>6–8</td>
<td>209B, MCC</td>
<td>Engage with NGSS Using STEM Gauge™ (p. 26)</td>
</tr>
<tr>
<td>8:00–9:30 AM</td>
<td>3–C</td>
<td>207D, MCC</td>
<td>Integrating Chromebook with Vernier Technology (p. 26)</td>
</tr>
<tr>
<td>8:00–9:30 AM</td>
<td>9–12</td>
<td>206 A/B, MCC</td>
<td>Forensic Science for High School, 3rd Edition (p. 25)</td>
</tr>
<tr>
<td>8:30–9:00 AM</td>
<td>K–12</td>
<td>107B, MCC</td>
<td>Albert Einstein Distinguished Educator Fellowship Program: Exciting Opportunities for K–12 STEM Educators to Influence Federal Programs and Policy in Washington, D.C. (p. 23)</td>
</tr>
<tr>
<td>8:30–9:00 AM</td>
<td>2–C</td>
<td>110A, MCC</td>
<td>Development of a Science Maker Kit for Inquiry-Based Teaching: Ideation and Feedback (p. 23)</td>
</tr>
<tr>
<td>8:00–9:30 AM</td>
<td>6–12</td>
<td>209C, MCC</td>
<td>Implementing Three-Dimensional Learning (p. 26)</td>
</tr>
<tr>
<td>8:00–9:30 AM</td>
<td>5–8</td>
<td>214, MCC</td>
<td>Get that Grant Money! (p. 26)</td>
</tr>
<tr>
<td>8:00–9:30 AM</td>
<td>6–12</td>
<td>208A, MCC</td>
<td>Contextualizing Science Literacy with Agriculture (p. 23)</td>
</tr>
<tr>
<td>8:30–9:00 AM</td>
<td>P–3</td>
<td>101E, MCC</td>
<td>Little Learners, BIG Ideas: Innovative Thinking in Early Childhood (p. 28)</td>
</tr>
<tr>
<td>8:30–9:30 AM</td>
<td>K–C</td>
<td>Fisk One, Renaissance</td>
<td>Making Students Scientists (p. 29)</td>
</tr>
<tr>
<td>8:30–9:00 AM</td>
<td>P–C</td>
<td>Broadway B, Omni</td>
<td>Integrated STEM Learning with the ASSIST Teaching Approach (p. 28)</td>
</tr>
<tr>
<td>8:30–9:00 AM</td>
<td>5–C</td>
<td>Broadway G, Omni</td>
<td>Learning to Teach Science in an Online Environment (p. 28)</td>
</tr>
<tr>
<td>8:30–9:00 AM</td>
<td>3–8</td>
<td>Davidson A2/3, MCC</td>
<td>Influence of 1:1 Chromebooks on Student Learning and Associated Professional Development Strategies (p. 28)</td>
</tr>
<tr>
<td>8:00–9:30 AM</td>
<td>2–C</td>
<td>Cumberland 2, Omni</td>
<td>Teach Your Students to Consciously Replace Misconceptions with Sound Scientific Knowledge (p. 28)</td>
</tr>
<tr>
<td>8:30–9:30 AM</td>
<td>5–8</td>
<td>214, MCC</td>
<td>Teaching and Learning: Perspective on K–12 from Scientists (p. 30)</td>
</tr>
<tr>
<td>9:30–10:00 AM</td>
<td>1–6/C</td>
<td>Fisk One, Renaissance</td>
<td>Integrating Probes in the Interactive Notebook: The More You Put “IN” the More You Get “OUT!” (p. 30)</td>
</tr>
<tr>
<td>3–12</td>
<td>Acoustic, Omni</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>1–5</td>
<td>Cumberland 5, Omni</td>
<td>Using a Model of Shared Language to Build Science Literacy (p. 34)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>P–5</td>
<td>106A, MCC</td>
<td>Adopting, Adapting, and Applying the 5E Instructional Model to Enhance Science Experiences for Students with Special Needs (p. 32)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>7–12</td>
<td>Broaday G, Omni</td>
<td>Enhancing and Integrating NGSS Strands Through Appropriate Uses of Technology (p. 33)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–12</td>
<td>Broaday H, Omni</td>
<td>Building Capacity for NGSS in Your District (p. 33)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>K–6</td>
<td>103C, MCC</td>
<td>NGSS and CCSS Mashup: Science Museum Transforms Teaching (p. 32)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>K–12</td>
<td>Music Row 5, Omni</td>
<td>Equity: Buzzword or Catalyst during a District Transition to the NGSS (p. 34)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>K–8</td>
<td>105B, MCC</td>
<td>Building Claims, Evidence, Reasoning (CER) Skills Through a Pink Palace Museum and Shelby County Schools Collaboration (p. 32)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>P–C</td>
<td>Fisk Two, Renaissance</td>
<td>What Do They Think? Engaging and Assessing through the Use of Visual Media (p. 34)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>K–6</td>
<td>104B, MCC</td>
<td>Science Notebooks: Tools to Develop Scientific Practices and Student Learning (p. 32)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>P–5</td>
<td>106B, MCC</td>
<td>Using Lab Notebooks in the Preschool and Elementary Classroom (p. 35)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>9–12</td>
<td>101 A/B, MCC</td>
<td>Teaching Macromolecules Through the Lense of Nutrition (p. 31)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>K–5</td>
<td>104A, MCC</td>
<td>Using Argument-Driven Inquiry with Science Writing in the K–5 Classroom (p. 32)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>K–12</td>
<td>Grand Blrm. C1, MCC</td>
<td>NGSS Share-a-Thon (p. 33)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>P–C</td>
<td>Cumberland 2, Omni</td>
<td>I CAN Ask a Question! DID I Define a Problem? (p. 33)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>3–12</td>
<td>Legends E, Omni</td>
<td>Building Partnerships: Schools, Museums, Nature, along with Science Centers, Scientists, and MITS (p. 36)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>K–12</td>
<td>Legends G, Omni</td>
<td>Analyzing and Interpreting Data: A 3-D Look at the Practice (p. 36)</td>
</tr>
<tr>
<td>Time</td>
<td>Session</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>Promoting Scientific Reasoning through Writing (p. 34)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>BSCS Pathway Session: Using the BSCS 5E Instructional Model to Promote Three-Dimensional Learning (p. 36)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>STEM Learning Ecosystems (p. 33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:30–11:00 AM</td>
<td>Teacher Researcher Day Session: Integrating Instruction to Meet Student Needs (p. 37)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00–10:30 AM</td>
<td>Professional Learning Communities for Science Leaders (p. 38)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00–10:30 AM</td>
<td>Weight and See (p. 38)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00–10:30 AM</td>
<td>Easy Ways to Modify Existing Lessons to Deepen Student Understanding (p. 38)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>Grant Writing: Pipelines, Partnerships, and Finding Funding (p. 40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>The Truth Behind Brain-Based Learning (p. 39)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>Elementary Science with Vernier (p. 40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>Make Science Come to Life (p. 42)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>National Geographic Educator Certification Program (p. 41)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>No Great Science Student (NGSS) Left Behind with NexGen Inquiry™ (p. 39)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>Implementing 3D Printing Across the K–12 Curriculum (p. 39)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:15–10:45 AM</td>
<td>Meet Me in the Middle Session: What the NGSS Mean to a Middle Level Teacher—Thoughts from a Member of the Writing Team (p. 43)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00–11:30 AM</td>
<td>Meet Me in the Middle Session: Roundtable Discussions for Middle School Educators, Part 1 (p. 43)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00–11:30 AM</td>
<td>Meet Me in the Middle Session: Roundtable Discussion—Awards, Recognition, and Competitions for Middle School Educators (p. 44)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00–11:30 AM</td>
<td>Meet Me in the Middle Session: Roundtable Discussions for Middle School Educators, Part 2 (p. 44)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Meet Me in the Middle Session: Science and Special Education—How to Make It Work (p. 44)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Spoiling Everything They Love: The Truth Behind Pizza and Other Foods (p. 44)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Community Stakeholders: Banding Together to Leverage Green Schools (p. 44)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Using STEM to Fight the Zombies! (p. 50)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>How to Assess Three-Dimensional Learning in Your Classroom: Building Tasks that Work (p. 50)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Free Online Software for Visualizing Data Across Multiple Disciplines (p. 52)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>NSEL A Session: Tools for Science Leaders (p. 47)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Reviewers Needed for NSTA’s Journals (p. 48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Ten NGSS Talking Points: How to Talk about the Next Generation Science Standards in Your School and Community (p. 45)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Before and After Retirement—Practicalities and Possibilities (p. 47)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>NSTA Press® Session: Learn Strategies to Help You Implement the NGSS Practices! (p. 50)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Nuts and Bolts of Science Program Leadership at the District Level (p. 48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>NSTA Press® Session: Diving into the NGSS Disciplinary Core Ideas: How and Why They Are Important for Teaching and Learning (p. 45)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Reframing Classic Elementary Science Lessons with the NGSS (p. 50)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>BSCS Pathway Session: Designing Effective Professional Development for the Next Generation Science Standards (p. 52)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Teacher Researcher Day Session: Exploring Geoscience Methods: An InTeGrate Module for Preservice Secondary Science Teachers (p. 48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Teacher Researcher Day Session: Project Based Learning as a Tool for Success (p. 48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Designing a Districtwide K–12 Science Program (p. 48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Teacher Researcher Day Session: Claims and Evidence: Developing Scientific Argumentation for ELL, IEP, GT, and General Education Middle School Students (p. 48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Shifting Your Lessons to Target NGSS Science and Engineering Practices Using the NextGen ASET Rubrics (p. 52)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>All About Those Bass-ic Materials in Science (p. 48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Science Can Flow Like Poetry! (p. 52)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Schedule at a Glance

<table>
<thead>
<tr>
<th>Time</th>
<th>Room</th>
<th>Session</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00 AM–12 Noon</td>
<td>4–12 West Blrm., Renaissance</td>
<td>Transforming Teaching into Three-Dimensional Learning (p. 49)</td>
<td>Renaissance</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>6–12 Cumberland 3, Omni</td>
<td>Academic Language: More Vocabulary Strategies to Enhance Engagement and Learning (p. 46)</td>
<td>Omni</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>K–C Mockingbird 4, Omni</td>
<td>ACT's National Curriculum Survey: Insights about Science Curricula on a National Scale (p. 48)</td>
<td>Renaissance</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>P–C Cumberland 2, Omni</td>
<td>Science for All: Including Diverse Learners (p. 46)</td>
<td>Omni</td>
</tr>
<tr>
<td>11:30 AM–12 Noon</td>
<td>4–12 Music City Blrm., Renaissance</td>
<td>Using Social Media to Enhance Science Class (p. 53)</td>
<td>Renaissance</td>
</tr>
<tr>
<td>12 Noon–1:30 PM</td>
<td>P–C East Blrm., Renaissance</td>
<td>Teacher Researcher Day Session: Leading from the Classroom: Science Inquiry Group Network (p. 53)</td>
<td>Renaissance</td>
</tr>
<tr>
<td>12 Noon–1:30 PM</td>
<td>6-9 209C, MCC</td>
<td>SAE Middle School Educational Offerings (p. 54)</td>
<td>MCC</td>
</tr>
<tr>
<td>12 Noon–1:30 PM</td>
<td>7–C 201B, MCC</td>
<td>Learning Through Hands-On Activities (p. 53)</td>
<td>MCC</td>
</tr>
<tr>
<td>12 Noon–1:30 PM</td>
<td>3–12 210, MCC</td>
<td>Citizen Science—From Classroom to Field with the U.S. Fish and Wildlife Service (p. 54)</td>
<td>MCC</td>
</tr>
<tr>
<td>12 Noon–1:30 PM</td>
<td>1–5 211, MCC</td>
<td>Make Science Come to Life (p. 55)</td>
<td>MCC</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>P–12 103B, MCC</td>
<td>Empowering Our Students to Be Citizen Scientists! (p. 56)</td>
<td>MCC</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>P–C East Blrm./Gr 4, Renaissance</td>
<td>Teacher Researcher Day Session: Communicating in Scientific Ways (p. 57)</td>
<td>Renaissance</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>6–C East Blrm./Gr 2, Renaissance</td>
<td>Teacher Researcher Day Session: What Issues Impact Maximizing Instructional Time When Using a Technology-Centered Curriculum (p. 57)</td>
<td>Renaissance</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>1–8 East Blrm./Gr 1, Renaissance</td>
<td>Teacher Researcher Day Session: Do Novice Elementary Teachers See Scientists in Their Classroom? (p. 57)</td>
<td>Renaissance</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>9–12 Acoustic, Omni</td>
<td>Conceptually Concrete (p. 56)</td>
<td>Omni</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>9–12 Cumberland 3, Omni</td>
<td>STEM for All (p. 57)</td>
<td>Omni</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>K–12 Cumberland 1, Omni</td>
<td>Global Collaboration in the Science Classroom (p. 56)</td>
<td>Omni</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>6–C Electric, Omni</td>
<td>Standards-Based Grading Strategies and Solutions (p. 57)</td>
<td>Omni</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>7–C Cumberland 4, Omni</td>
<td>Eradicating Point Grubbing (p. 57)</td>
<td>OmnI</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>6–8 Broadway A, Omni</td>
<td>Meet Me in the Middle Session: Formative Assessment in the Classroom (p. 56)</td>
<td>Omni</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>5–8 Broadway B, Omni</td>
<td>Meet Me in the Middle Session: Know the “Dirty Dozen” for a Safer Lab Experience! (p. 56)</td>
<td>Omni</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>5–8 Broadway C, Omni</td>
<td>Meet Me in the Middle Session: Citizen Science in YOUR Classroom (p. 58)</td>
<td>Omni</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>6–12 Davidson C, MCC</td>
<td>STEM Educators Award-Winning Share-a-Thon (p. 60)</td>
<td>MCC</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>K–12 Music Row 3, Omni</td>
<td>Nuts and Bolts of Science Program Leadership at the School Level (p. 61)</td>
<td>MCC</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>P–C Broadway J, Omni</td>
<td>Research Insights into Online Communities of Practice and Teacher Learning Online: NSTA Learning Center (p. 60)</td>
<td>MCC</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>K–5 104B, MCC</td>
<td>STEM for All: Building a Schoolwide STEM Program (p. 58)</td>
<td>MCC</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>P–3 106B, MCC</td>
<td>Science Notebooks K–3 (p. 62)</td>
<td>MCC</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>4–C Legends C, Omni</td>
<td>Taking Advantage of the Power of Google Drive (p. 62)</td>
<td>MCC</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>9–12 Broadway G, Omni</td>
<td>Harmonizing Science and Math: Making High School Math Relevant (p. 60)</td>
<td>MCC</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>C Mockingbird 2, Omni</td>
<td>Being a Unicorn: Preservice Teachers and Their Quest for a Professional Identity (p. 60)</td>
<td>MCC</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>K–5 104A, MCC</td>
<td>Bloom WhereYou Are Planted: Growing an Elementary STEM Program (p. 58)</td>
<td>MCC</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>K–5 101C, MCC</td>
<td>Supporting the NGSS and CCSS in Urban Elementary Classrooms (p. 61)</td>
<td>MCC</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>P–12 Fisk One, Renaissance</td>
<td>Science for Everyone! Engaging Science Instruction for Students with Profound Disabilities (p. 61)</td>
<td>Renaissance</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>9–C Legends G, Omni</td>
<td>A Practical Guide for Aligning Existing Materials to the NGSS: The EQuIP Rubric (p. 63)</td>
<td>Renaissance</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>K–8 Davidson A2/3, MCC</td>
<td>Students with Inquiring Minds Are Scientists (SWIMAS): A Study of Elementary Inquiry Science (p. 58)</td>
<td>MCC</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>K–C Music City Blrm., Renaissance</td>
<td>Mindset and the Educational Revolution (p. 61)</td>
<td>Renaissance</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>3–12 101E, MCC</td>
<td>Write to Know Science (p. 58)</td>
<td>MCC</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>5–C Grand Blrm. C2, MCC</td>
<td>School District and Community Engagement in STEM Education on the International Space Station... and Beyond (p. 60)</td>
<td>MCC</td>
</tr>
<tr>
<td>1:00–1:30 PM</td>
<td>6–C East Blrm./Gr 3, Renaissance</td>
<td>Teacher Researcher Day Session: How the Search for Bigfoot Can Teach Science and Engineering Practices (p. 65)</td>
<td>Renaissance</td>
</tr>
<tr>
<td>1:00–1:30 PM</td>
<td>9–12 103B, MCC</td>
<td>Using Career Academies to Develop Community Partnerships in the Classroom (p. 64)</td>
<td>MCC</td>
</tr>
<tr>
<td>1:00–1:30 PM</td>
<td>C Mockingbird 4, Omni</td>
<td>Developing Community College Students' Research Skills (p. 65)</td>
<td>Renaissance</td>
</tr>
<tr>
<td>1:00–1:30 PM</td>
<td>7 East Blrm./Gr 2, Renaissance</td>
<td>Teacher Researcher Day Session: Student-Developed Assessment (p. 65)</td>
<td>Renaissance</td>
</tr>
<tr>
<td>1:00–1:30 PM</td>
<td>9–12 Acoustic, Omni</td>
<td>Promoting Academic Integrity in Your Classroom (p. 64)</td>
<td>Renaissance</td>
</tr>
<tr>
<td>1:00–1:30 PM</td>
<td>K–12 Cumberland 1, Omni</td>
<td>“Link-ing” to Learn (p. 64)</td>
<td>Renaissance</td>
</tr>
<tr>
<td>Time</td>
<td>Session ID</td>
<td>Room</td>
<td>Title</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
<td>---------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1:00–2:30 PM</td>
<td>7–10</td>
<td>110A, MCC</td>
<td>Getting to Know the <em>Creative Coding Through Games and Apps</em> (CCGA) Course Content (p. 65)</td>
</tr>
<tr>
<td>1:15–1:45 PM</td>
<td>6–8</td>
<td>Broadway B, Omni</td>
<td>Meet Me in the Middle Session: Science Formative Assessment; What Do Middle School Students Really Think? (p. 66)</td>
</tr>
<tr>
<td>1:15–1:45 PM</td>
<td>6–8</td>
<td>Broadway D, Omni</td>
<td>Meet Me in the Middle Session: Using 5Es to Engage Middle Schoolers (p. 66)</td>
</tr>
<tr>
<td>1:15–1:45 PM</td>
<td>7–8</td>
<td>Broadway C, Omni</td>
<td>Meet Me in the Middle Session: Engaging Students in Science with Interactive Notebooks and Nature Journaling (p. 66)</td>
</tr>
<tr>
<td>2:00–2:30 PM</td>
<td>P–C</td>
<td>East Blrm./Gr 2, Renaissance</td>
<td>Teacher Researcher Day Session: Multimedia Portfolios as Assessment (p. 67)</td>
</tr>
<tr>
<td>2:00–2:30 PM</td>
<td>C</td>
<td>Music Row 3, Omni</td>
<td>Recruiting STEM Talent and Designing Pathways for STEM Teaching (p. 67)</td>
</tr>
<tr>
<td>2:00–2:30 PM</td>
<td>6–12</td>
<td>Cumberland 3, Omni</td>
<td>Using STEM Interactives in the Classroom to Connect Learning to Real-World Applications (p. 67)</td>
</tr>
<tr>
<td>2:00–2:30 PM</td>
<td>6–12</td>
<td>Acoustic, Omni</td>
<td>History Should Be Repeated in the Science Classroom (p. 66)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>4–12</td>
<td>Music City Blrm., Renaissance</td>
<td>The Magic of Science! Motivate Your Science Students Using “Discrepant Events” (p. 71)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>7–12</td>
<td>Legends E, Omni</td>
<td>Critical Perspectives on Using News Media in the Science Classroom (p. 72)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>K–5</td>
<td>101D, MCC</td>
<td>NSTA Press® Session: Five E(z), “Elementary” Steps To Next Generation Science Teaching (p. 68)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>2–5</td>
<td>104C, MCC</td>
<td>Integrating STEM into the Entire Elementary Curriculum (p. 71)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>1–6</td>
<td>104B, MCC</td>
<td>Don’t Open That Textbook Yet, You’ve Got a Story to Share! (p. 68)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>K–12</td>
<td>Cumberland 1, Omni</td>
<td>Building Effective STEM Partnerships on a Limited Budget (p. 70)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>3–C</td>
<td>Center Blrm., Renaissance</td>
<td>Science at the Dollar Store (p. 72)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>K–6/C</td>
<td>Electric, Omni</td>
<td>Enhancing Science Understanding through Conceptual Change Lessons (p. 70)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>K–12</td>
<td>Music Row 5, Omni</td>
<td>Equity in the Science Classroom (p. 71)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>3–C</td>
<td>Cumberland 5, Omni</td>
<td>Problem-Based Learning: A Partnership Using NGSS and CCLS (p. 70)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>K–C</td>
<td>Broadway B, Omni</td>
<td>Inside the Science Teacher’s Studio (p. 70)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>P–C</td>
<td>103B, MCC</td>
<td>NSTA/ASE Honors Lecture: The Learning Journey (p. 67)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>P–C</td>
<td>Grand Blrm. C2, MCC</td>
<td>Arthur C. Clarke Institute for Space Education Lecture: Thoughts on Science Education, Science, and Personal Beliefs (p. 68)</td>
</tr>
<tr>
<td>2:30–3:00 PM</td>
<td>1–5</td>
<td>211, MCC</td>
<td>Make Science Come to Life (p. 75)</td>
</tr>
<tr>
<td>2:30–3:00 PM</td>
<td>P–C</td>
<td>Davidson C, MCC</td>
<td>Multicultural/Equity Share-a-Thon (p. 73)</td>
</tr>
<tr>
<td>2:30–3:00 PM</td>
<td>5–9</td>
<td>Broadway E/F, Omni</td>
<td>Meet Me in the Middle Session: Middle Level Share-a-Thon (p. 76)</td>
</tr>
<tr>
<td>2:30–3:00 PM</td>
<td>P–C</td>
<td>Broadway K, Omni</td>
<td>Alliance of Affiliates Session: The 3Rs: Research, Resources, and Relationships (p. 76)</td>
</tr>
<tr>
<td>2:30–3:00 PM</td>
<td>K–C</td>
<td>Cumberland 2, Omni</td>
<td>The Future of School (p. 76)</td>
</tr>
<tr>
<td>2:30–3:00 PM</td>
<td>7–12</td>
<td>Cumberland 3, Omni</td>
<td>Putting the TECH into TEaCHing (p. 76)</td>
</tr>
<tr>
<td>2:30–3:00 PM</td>
<td>6–12</td>
<td>Acoustic, Omni</td>
<td>Culturally Relevant Teaching Practices in Science Classrooms (p. 76)</td>
</tr>
<tr>
<td>2:30–3:00 PM</td>
<td>6–C</td>
<td>East Blrm./Gr 4, Renaissance</td>
<td>Teacher Researcher Day Session: The Effect of Scientific Research on High School Students (p. 77)</td>
</tr>
<tr>
<td>2:30–3:00 PM</td>
<td>P–C</td>
<td>East Blrm./Gr 1, Renaissance</td>
<td>Teacher Researcher Day Session: Using Scientific Literacy as a Reflective Practitioner (p. 77)</td>
</tr>
<tr>
<td>2:30–3:00 PM</td>
<td>1–C</td>
<td>East Blrm./Gr 2, Renaissance</td>
<td>Teacher Researcher Day Session: Learning About Motion Is MESSY (p. 77)</td>
</tr>
<tr>
<td>2:30–3:00 PM</td>
<td>C</td>
<td>Music Row 3, Omni</td>
<td>How to Create an Engaging and Successful Online Science Classroom (p. 76)</td>
</tr>
<tr>
<td>3:00–4:30 PM</td>
<td>7–12</td>
<td>110A, MCC</td>
<td>The Differentiated Classroom in One Package: Teaching Science Inquiry to Modern Learners Using Microsoft Surface and Apps (p. 77)</td>
</tr>
<tr>
<td>3:30–4:00 PM</td>
<td>7–C</td>
<td>Fisk One, Renaissance</td>
<td>Using Multi-Genre Writing to Infuse NGSS into the Science Classroom (p. 77)</td>
</tr>
<tr>
<td>3:30–4:00 PM</td>
<td>1–7</td>
<td>Davidson A2/3, MCC</td>
<td>Oh Say, Can You C-E-R? (p. 78)</td>
</tr>
<tr>
<td>3:30–4:00 PM</td>
<td>7–12</td>
<td>Cumberland 2, Omni</td>
<td>But I Can’t Do Science! Changing a Culture of Learned-Helplessness through Standards-based Grading (p. 80)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>9–12</td>
<td>Acoustic, Omni</td>
<td>Multi-Level Peer Tutoring Supports Student Success in High School Science (p. 80)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>K–C</td>
<td>Fisk Two, Renaissance</td>
<td>A Visual Representation of Three-Dimensional Learning: A Model for Understanding and a Tool for Evaluating Curricula (p. 81)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>3–C</td>
<td>101C, MCC</td>
<td>NSTA Press® Session: Uncovering Student STEM-Connected Ideas in Science (p. 82)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>K–6</td>
<td>104B, MCC</td>
<td>Full STEAM Ahead (p. 78)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>9–C</td>
<td>Cumberland 4, Omni</td>
<td>Using Models to Teach How Blood Spatter Tells a Story! (p. 80)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12</td>
<td>Broadway G, Omni</td>
<td>Bring the Experts (Virtualiy) into Your Classroom (p. 80)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>7–12</td>
<td>103A, MCC</td>
<td>Motivating Modeling with Anchoring Phenomena and Challenge Questions (p. 82)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>8–10</td>
<td>Music Row 3, Omni</td>
<td>How to Get Students to Open Their Textbooks and Look Forward to It (p. 81)</td>
</tr>
</tbody>
</table>
### Schedule at a Glance

#### General Science Education

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:30–4:30 PM</td>
<td>K–8</td>
<td>Music Row 5, Omni</td>
<td>SIRA: Science Instruction Reflection and Assessment: Creating a Curricular Roadmap to NGSS (p. 81)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–8</td>
<td>Broadway H, Omni</td>
<td>Weaving Literacy and Technology into the Middle School Science Classroom (p. 80)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12</td>
<td>Legends G, Omni</td>
<td>and…ACTION! (p. 83)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>5–12</td>
<td>Music Row 1, Omni</td>
<td>Becoming Teacher Leaders in a Turnaround School (p. 81)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12</td>
<td>Music Row 2, Omni</td>
<td>Three Steps to Greater Use of NGSS Practices and Stellar Student Research Projects (p. 81)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>K–12</td>
<td>Center Blrm., Renaissance</td>
<td>Showing Student Growth of the NGSS: How Do You Know that Your Students Are Really Learning? (p. 83)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>K–12</td>
<td>Legends F, Omni</td>
<td>Planning a Journey Toward the NGSS (p. 83)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>K–C</td>
<td>Legends E, Omni</td>
<td>Using Whiteboarding as a Strategy for Integrating ELA into Science (p. 83)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>5–12</td>
<td>Music City Blrm., Renaissance</td>
<td>Interactive Notebooks in Middle School Science (p. 81)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>P–C</td>
<td>101D, MCC</td>
<td>Featured Presentation: Bundling the NGSS Performance Expectations (p. 78)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>9–12</td>
<td>101E, MCC</td>
<td>From Cookbook to Open Inquiry: How to Develop the Necessary Skills (p. 78)</td>
</tr>
<tr>
<td>4:00–4:30 PM</td>
<td>5–12</td>
<td>Fisk One, Renaissance</td>
<td>Standardized Tests Put to Good Use (p. 84)</td>
</tr>
<tr>
<td>5:00–5:30 PM</td>
<td>9–12</td>
<td>Music Row 1, Omni</td>
<td>Let’s Get Talkin’ About Science! (p. 85)</td>
</tr>
<tr>
<td>5:00–5:30 PM</td>
<td>6–C</td>
<td>101E, MCC</td>
<td>Enhanced Exit Ticket: Round-Trip to Greater Student-Teacher Accountability (p. 84)</td>
</tr>
<tr>
<td>5:00–5:30 PM</td>
<td>3–6</td>
<td>104B, MCC</td>
<td>Integrating Science, Reading, and Writing with a Three-in-One Project (p. 84)</td>
</tr>
<tr>
<td>5:00–5:30 PM</td>
<td>5–10</td>
<td>West Blrm., Renaissance</td>
<td>Powering Our Students’ Futures (p. 85)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>12–C</td>
<td>Mockingbird 4, Omni</td>
<td>Integration of the NGSS into an Interdisciplinary Freshman Experience Course (p. 87)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>7–12</td>
<td>101E, MCC</td>
<td>Stimulate Student Learning with Food! (p. 90)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>7–12</td>
<td>101D, MCC</td>
<td>Teaching as Storytelling: How to Infuse History, Mystery, and Inquiry into Your Science Topic Teaching (p. 87)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>6–9</td>
<td>103C, MCC</td>
<td>Creating a Professional Learning Community to Facilitate Collaboration in Science Inclusion Classrooms (p. 87)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>9–12</td>
<td>101E, MCC</td>
<td>Retiring? Tips for the Next Phase of Your Life (p. 87)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>9–C</td>
<td>204, MCC</td>
<td>Exploring Different Acid/Base Indicators in the Classroom (p. 96)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>6–C</td>
<td>101C, MCC</td>
<td>EdTech and Your Ideal Classroom: Using Educational Technology to Support a Science Classroom Community (p. 97)</td>
</tr>
</tbody>
</table>

### General Science Education: Sunday

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–8:30 AM</td>
<td>5–9</td>
<td>106A, MCC</td>
<td>Reasons Students Struggle with Reasoning (p. 93)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–12</td>
<td>208B, MCC</td>
<td>Science in the One-to-One Classroom (p. 94)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–12</td>
<td>207B, MCC</td>
<td>Forensics 101: From the Ground Up (p. 94)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>9–12</td>
<td>209A, MCC</td>
<td>Integrating Literacy Standards in Science (p. 94)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>5–12</td>
<td>208A, MCC</td>
<td>Go Green! Build and Sustain a Project-Based Learning Garden Program at Your School! (p. 94)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–9</td>
<td>103C, MCC</td>
<td>Chapter Books at the Crossroads of the NGSS and CCSS (p. 96)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>2–8</td>
<td>106C, MCC</td>
<td>What Constitutes High-Quality Discussion in a Science Classroom? (p. 93)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–8</td>
<td>205C, MCC</td>
<td>Learning Targets for Student-led Labs (p. 94)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>9–12</td>
<td>209B, MCC</td>
<td>Partnering with Community Resources to Create a Whodunit (p. 94)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>P–C</td>
<td>209C, MCC</td>
<td>Industry’s Role in Creating the Next Generation of Scientists (p. 96)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>K–6</td>
<td>104B, MCC</td>
<td>iPad Apps for STEM Activities in the Elementary Classroom (p. 93)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>5–C</td>
<td>101C, MCC</td>
<td>NSTA Press® Session: CCSS ELA and Literacy + NGSS = Even More Brain-Powered Science (p. 96)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>K–5</td>
<td>104D, MCC</td>
<td>Exploring Different Acid/Base Indicators in the Classroom (p. 96)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>9–12</td>
<td>202C, MCC</td>
<td>Learning to Fail: Building Confidence with Data Collection (p. 97)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>9–C</td>
<td>204, MCC</td>
<td>EdTech and Your Ideal Classroom: Using Educational Technology to Support a Science Classroom Community (p. 97)</td>
</tr>
</tbody>
</table>
Schedule at a Glance

General Science Education

8:00–9:00 AM P–8 105A, MCC  Project-Based Learning (PBL) for 21st-Century Thinkers and Innovators (p. 97)
8:30–9:00 AM 4–9 106A, MCC  Universal Design for Learning: What It Is, and What It Isn’t (p. 98)
8:30–9:00 AM 5–12 101E, MCC  Using Expeditions as Contexts for Teaching Science: Adventure Mississippi River (p. 98)
9:30–10:00 AM K–5 101E, MCC  Science Fair: A Learning Progression Across K–5 (p. 98)
9:30–10:00 AM K–6 104A, MCC  How Does Vocabulary Fit into PBL for English Language Learners? (p. 98)
9:30–10:30 AM K–8 103C, MCC  Project-Based Learning: How It Has Changed Teaching and Learning in Our School (p. 100)
9:30–10:30 AM 7–12 204, MCC  Are You EQUIpped? (p. 102)
9:30–10:30 AM K–8 106C, MCC  Modeling the NGSS Way (p. 102)
9:30–10:30 AM 4–8 106B, MCC  Inquiry through Teamwork! (p. 102)
9:30–10:30 AM 5–12 108, MCC  Coding Computer Games to Motivate Middle School Science Students (p. 100)
9:30–10:30 AM 6–12 109, MCC  Fall Head Over Heels for Flipping Your Classroom! (p. 100)
9:30–10:30 AM K–8 106C, MCC  Modeling the NGSS Way (p. 102)
9:30–10:30 AM 4–8 106B, MCC  Inquiry through Teamwork! (p. 102)
9:30–10:30 AM 5–12 108, MCC  Coding Computer Games to Motivate Middle School Science Students (p. 100)
9:30–10:30 AM 6–12 109, MCC  Fall Head Over Heels for Flipping Your Classroom! (p. 100)
9:30–10:30 AM K–8 106C, MCC  Modeling the NGSS Way (p. 102)
9:30–10:30 AM 4–8 106B, MCC  Inquiry through Teamwork! (p. 102)
9:30–10:30 AM 5–12 108, MCC  Coding Computer Games to Motivate Middle School Science Students (p. 100)
9:30–10:30 AM 6–12 109, MCC  Fall Head Over Heels for Flipping Your Classroom! (p. 100)

Informal Science Education: Saturday

8:00–8:30 AM K–12 Acoustic, Omni  Making Informal Partnerships More Formal (p. 15)
8:00–9:00 AM K–8 105B, MCC  Beyond the Fair: Carnivals, Olympiads, and STEAM Clubs—Oh My! (p. 21)
8:00–9:00 AM K–12 Music Row 3, Omni  ASTC Session: Beyond the Classroom Walls—Tapping into Informal Science Centers to Support Student-Driven Investigations (p. 19)
8:00–9:00 AM K–12 103B, MCC  Science Ambassadors: Partnering Elementary and High Schools for STEM Night Events (p. 31)
8:00–9:00 AM 1–12 Cumberland 3, Omni  After-School STEM Partnerships in Nashville (p. 18)
8:00–9:00 AM K–12 101B, MCC  Engagement Unlocked! Using Learning Games for STEM (p. 24)
8:30–9:00 AM 1–12 Music Row 3, Omni  Smithsoniannational Air and Space Museum Exhibits as Sources for STEM Investigations (p. 28)
9:30–10:00 AM 1–5/9–12 103B, MCC  Science Ambassadors: Partnering Elementary and High Schools for STEM Night Events (p. 31)
9:30–10:00 AM G 104A, MCC  Using the 2017 U.S. Total Solar Eclipse to Promote Educational Outreach (p. 32)
9:30–10:00 AM 6–C Legends F, Omni  Family Science Night: Involving Community Stakeholders (p. 36)
9:30–10:00 AM K–12 Legends C, Omni  Engage Families with Your STEM Teaching (p. 36)
10:00–11:30 AM 2–C 110B, MCC  McDowell Farm School: Integrating Best Practices in a Scientific Garden (p. 39)
10:00–11:30 AM 3–8 210, MCC  Engaging Your Students Through the U.S. Fish & Wildlife Service’s Conservation Connect (p. 42)
11:00 AM–12 Noon P–C Cumberland 1, Omni  Best Practices in Community Partnerships: It’s a Two-Way Street! (p. 46)
Schedule at a Glance

Informal Science Education

11:00 AM–12 Noon 1–8 Davidson A2/3, MCC
Using TALES to Enhance Learning in an After-School Program (p. 46)

11:00 AM–12 Noon 4–8 103B, MCC
Making STEAM Rise in Your School (p. 45)

11:00 AM–12 Noon P–C Music Row 5, Omni
Designing a Districtwide K–12 Science Program (p. 48)

11:30 AM–12 Noon K–C Fisk Two, Renaissance
Think Science—Taking It to the Streets (p. 53)

12 Noon–1:30 PM 3–12 210, MCC
Citizen Science—From Classroom to Field with the U.S. Fish and Wildlife Service (p. 54)

12:30–1:30 PM 5–C Grand Blrm. C2, MCC
School District and Community Engagement in STEM Education on the International Space Station...and Beyond (p. 60)

1:00–1:30 PM 9–C Electric, Omni
The Environmental Science Summer Research Experience for Young Women (p. 65)

2:00–2:30 PM K–12 Cumberland 2, Omni
Get the Maker Party Started (p. 66)

2:00–3:00 PM 1–C Legends C, Omni
Nano Days and Nights (p. 72)

2:00–4:00 PM P–C 104A, MCC
Science in the Community Session: Forum on Family Science Learning (p. 75)

3:30–4:30 PM K–11 West Blrm., Renaissance
Science Beyond the Classroom (p. 81)

5:00–6:00 PM P–12 Legends C, Omni
Introduction to LinkEngineering (p. 88)

5:00–6:00 PM 6–12 Cumberland 2, Omni
Hosting STEM Nights? Use Inquiry-Based Investigations to Engage Learners of All Ages (p. 86)

Informal Science Education: Sunday

8:00–9:00 AM 4–12 Davidson A2/3, MCC
Scientists for Tomorrow: An Initiative to Promote STEM in Out-of-School-Time Frameworks (p. 96)

8:00–9:00 AM 9–12 207C, MCC
Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events (p. 94)

8:00–9:00 AM P–8 106A, MCC
Help! I Don’t Know How to Grow Plants in My Classroom (p. 18)

8:00–9:00 AM 6–C Fisk Two, Renaissance
Deconstructing the Silos of Physical and Life Sciences in Grades 7–12 Classrooms (p. 19)

8:00–9:00 AM 6–8 Broadway D, Omni
At the Core of STEM: A Tale of Integrated Lessons for Middle School Students (p. 22)

8:00–9:00 AM K–11 West Blrm., Renaissance
Science Explorations with Deaf and Hard of Hearing Students (p. 22)

8:00–9:00 AM 3–7 103A, MCC
All Learners and the NGSS: The Importance of Three-Dimensional Learning and Reasoning (p. 20)

8:00–9:30 AM 12 107A, MCC
AP Environmental: Using Your Stream to Teach STEM-Based Skills (p. 23)

8:00–9:30 AM 6–8 202C, MCC
Tracking Student Growth in Science Practices (p. 24)

8:00–9:30 AM 9–C 212, MCC
Proteins Are the Cash of Biotech (p. 27)

8:00–9:30 AM 6–12 Broadway J, Omni
Coding Contagion: Teaching Computational Thinking and Scientific Modeling by Having Students Develop Simulations of an Outbreak (p. 28)

8:00–9:30 AM 6–12 207B, MCC
Zombie Apocalypse! (p. 25)

8:00–9:30 AM 7–12 207A, MCC
Vampire Chronicles: Sink Your Teeth into Genetics and Blood Typing (p. 25)

8:00–9:30 AM 9–12 205B, MCC
Interactive Case Studies: Supplemental Software to Improve Critical Thinking in the Biology Classroom (p. 24)

9:30–10:00 AM 9–12 Cumberland 4, Omni
Who’s Afraid of the Big Idea? Teaching about Ecosystems by Examining Wolves and Their Food Chains (p. 30)

9:30–10:30 AM 3–C Electric, Omni
ICARUS (p. 34)

9:30–10:30 AM 9–12 Cumberland 3, Omni
Differentiating Life Science NGSS for Lower-Level Students (p. 34)

9:30–10:30 AM P–C Grand Blrm. C2, MCC
Paul F-Brandwein Lecture: Love: The Four-Letter Word That Science Forgot (p. 31)

Life Science: Saturday

8:00–8:30 AM 7–12 Broadway J, Omni
A Consilient Approach to Interdisciplinary History and Science (p. 16)

8:00–9:00 AM P–8 106A, MCC
Help! I Don’t Know How to Grow Plants in My Classroom (p. 18)

8:00–9:00 AM 6–C Cumberland 4, Omni
Dragon Genetics and Other Powerful Free Simulations for Biology Teaching (p. 18)

8:00–9:00 AM 5–C Fisk Two, Renaissance
Deconstructing the Silos of Physical and Life Sciences in Grades 7–12 Classrooms (p. 19)

8:00–9:00 AM 6–8 Broadway D, Omni
At the Core of STEM: A Tale of Integrated Lessons for Middle School Students (p. 22)

8:00–9:00 AM K–11 West Blrm., Renaissance
Science Explorations with Deaf and Hard of Hearing Students (p. 22)

8:00–9:00 AM 3–7 103A, MCC
All Learners and the NGSS: The Importance of Three-Dimensional Learning and Reasoning (p. 20)

8:00–9:30 AM 12 107A, MCC
AP Environmental: Using Your Stream to Teach STEM-Based Skills (p. 23)

8:00–9:30 AM 6–8 202C, MCC
Tracking Student Growth in Science Practices (p. 24)

8:00–9:30 AM 9–C 212, MCC
Proteins Are the Cash of Biotech (p. 27)

8:00–9:30 AM 6–12 Broadway J, Omni
Coding Contagion: Teaching Computational Thinking and Scientific Modeling by Having Students Develop Simulations of an Outbreak (p. 28)

8:00–9:30 AM 6–12 207B, MCC
Zombie Apocalypse! (p. 25)

8:00–9:30 AM 7–12 207A, MCC
Vampire Chronicles: Sink Your Teeth into Genetics and Blood Typing (p. 25)

8:00–9:30 AM 9–12 205B, MCC
Interactive Case Studies: Supplemental Software to Improve Critical Thinking in the Biology Classroom (p. 24)

9:30–10:00 AM 9–12 Cumberland 4, Omni
Who’s Afraid of the Big Idea? Teaching about Ecosystems by Examining Wolves and Their Food Chains (p. 30)

9:30–10:30 AM 3–C Electric, Omni
ICARUS (p. 34)

9:30–10:30 AM 9–12 Cumberland 3, Omni
Differentiating Life Science NGSS for Lower-Level Students (p. 34)

9:30–10:30 AM P–C Grand Blrm. C2, MCC
Paul F-Brandwein Lecture: Love: The Four-Letter Word That Science Forgot (p. 31)
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30–10:30 AM</td>
<td>*–C 101E, MCC Students Answer Sustainable Energy Research Questions with Current Science and Engineering Data (p. 35)</td>
<td></td>
</tr>
<tr>
<td>9:30–11:30 AM</td>
<td>K–12 Broadway J, Omni AMSE Session: George W. Carver Conversations Series on Diversity and Equity (p. 38)</td>
<td></td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>8–C 214, MCC Let’s Get Helical (p. 42)</td>
<td></td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>K–12 108, MCC Stretch Your Legs for Science! (p. 38)</td>
<td></td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>3–8 210, MCC Engaging Your Students Through the U.S. Fish &amp; Wildlife Service’s Conservation Connect (p. 42)</td>
<td></td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>5–8 209C, MCC The REAL Story of the Animal Kingdom on Planet Earth (p. 42)</td>
<td></td>
</tr>
<tr>
<td>10:00–11:30 AM</td>
<td>9–C 208A, MCC NGSS in the High School Biology Classroom (p. 40)</td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>6–C Cumberland 4, Omni Brain Science: Resources for the Classroom (p. 46)</td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>5–10 101E, MCC Your Kids Can, Too! Scientific Argumentation for All Students (p. 49)</td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>K–8 101C, MCC NSTA Press® Session: Bringing Outdoor Science In (p. 49)</td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>9–12 106B, MCC The 6th Mass Extinction: Student Inquiry-based Lessons on the Decline of Earth’s Biodiversity (p. 50)</td>
<td></td>
</tr>
<tr>
<td>12 Noon–1:30 PM</td>
<td>6–8 209A, MCC Hands-On Integrated Science Activities for Middle School from Flinn Scientific (p. 54)</td>
<td></td>
</tr>
<tr>
<td>12 Noon–1:30 PM</td>
<td>9–C 207C, MCC Biology with Vernier (p. 54)</td>
<td></td>
</tr>
<tr>
<td>12 Noon–1:30 PM</td>
<td>5–C 214, MCC Constructing and Crossing Cell Membranes (p. 55)</td>
<td></td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>7–C Legends D, Omni Quick ‘n Easy GMO Detection: Engage Students with Real-World Biotechnology and Genetics (p. 63)</td>
<td></td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>5–9 105B, MCC Designing Classroom Assessments to Address NGSS Performance Expectations (p. 58)</td>
<td></td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>P–5 105A, MCC Planting a School Garden on a Shoestring Budget (p. 62)</td>
<td></td>
</tr>
<tr>
<td>1:00–1:30 PM</td>
<td>9–C Electric, Omni The Environmental Science Summer Research Experience for Young Women (p. 65)</td>
<td></td>
</tr>
<tr>
<td>1:00–1:30 PM</td>
<td>6–8 103A, MCC Explaining Population Dynamics Through the Modeling of Long-Term Data on Hurricane Disturbance in Puerto Rico (p. 64)</td>
<td></td>
</tr>
<tr>
<td>1:00–1:30 PM</td>
<td>7–12 East Blrm./Gr 1, Renaissance Teacher Researcher Day Session: The Effects of Student Collaboration on Performance in a Grade 9 Biology Class (p. 65)</td>
<td></td>
</tr>
<tr>
<td>1:00–1:30 PM</td>
<td>6–10 Cumberland 5, Omni Fish Kill! A Three Dimensional Learning Unit (p. 65)</td>
<td></td>
</tr>
<tr>
<td>1:15–1:45 PM</td>
<td>4–10 Broadway A, Omni Meet Me in the Middle Session: Earworms and Melodies: Teaching Science Through Songs (p. 66)</td>
<td></td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>K–3 101 A/B, MCC Holy Moly Roly Poly! (p. 71)</td>
<td></td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>6–8 Broadway H, Omni EXENTHUNCO (p. 70)</td>
<td></td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>6–12 106B, MCC Participating in the Global Decomposition Project and Using the IMOLD Interactive Model of Leaf Decomposition (p. 72)</td>
<td></td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>7–12 Music Row 2, Omni Using Machine Learning to Measure Learning Progressions and Inform Instruction (p. 71)</td>
<td></td>
</tr>
<tr>
<td>2:00–3:30 PM</td>
<td>1–6 207A, MCC Elementary Science Activity Jamboree (p. 74)</td>
<td></td>
</tr>
<tr>
<td>2:00–3:30 PM</td>
<td>7–12 208B, MCC ECO Classroom: Free Experiential Learning in the Rainforests of Costa Rica (p. 74)</td>
<td></td>
</tr>
<tr>
<td>2:00–3:30 PM</td>
<td>9–C 207C, MCC Human Physiology with Vernier (p. 74)</td>
<td></td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12 Cumberland 1, Omni Differentiating Content, Process, and Product: Examples from Earth History, Ecology, Force and Motion, and Astronomy Units (p. 80)</td>
<td></td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>9–12 Mockingbird 4, Omni Are You a Co-Teacher? Rethinking Roles through a Consult Model (p. 81)</td>
<td></td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>9–10 Broadway J, Omni Open and Guided Inquiry in Biology (p. 80)</td>
<td></td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>K–5 104E, MCC Building Plant Literacy with NGSS and CCSS (p. 82)</td>
<td></td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>P–11 105A, MCC Butterfly Bonanza (p. 82)</td>
<td></td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>5–8 105B, MCC Using the Tools of the NGSS to Reach Girls in Science (p. 82)</td>
<td></td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12 106A, MCC Climate Studies with Global Hawk and NASA Airborne Science (p. 78)</td>
<td></td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>9–11 103C, MCC A Cross-Curricular Contamination Case: Integrating Core Content Through Self-Paced Learning (p. 86)</td>
<td></td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>9–12 106A, MCC The Maker Movement in EC–Grade 8 Classrooms (p. 86)</td>
<td></td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>6–8 Broadway G, Omni Food Chains: Using Field Surveys That Give Real Results (p. 86)</td>
<td></td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>6–12 Legends E, Omni CRASH Science! Investigating the Dangers of Distracted Driving (p. 88)</td>
<td></td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>4–10 Fisk Two, Renaissance The Argumentation Toolkit: The Lawrence Hall of Science Presents a Collection of Multimedia Resources to Support Teacher Learning About Argumentation (p. 90)</td>
<td></td>
</tr>
<tr>
<td>5:30–6:00 PM</td>
<td>P–2 104B, MCC Think It, Map It, Write It, Learn It! (p. 90)</td>
<td></td>
</tr>
</tbody>
</table>
GSTA Nashville National Conference on Science Education

Schedule at a Glance

Life Science: Sunday

8:00–9:00 AM  5–8  205B, MCC  Sources of Pedagogical Content Knowledge for Teaching Life Sciences in Middle School (p. 93)
8:00–9:00 AM  6–C  103A, MCC  Is Your Beak Stuck? How to Use the Three Dimensions of the NGSS in a Natural Selection Activity (p. 96)
8:30–9:00 AM  1–5  104A, MCC  Nature on My Block: Place-Based Ecology Lessons for Urban Students (p. 93)
9:30–10:00 AM  P–3  103B, MCC  Planting the Seeds to Cultivate Meaningful Science Practices in Garden Classrooms (p. 98)
9:30–10:00 AM  4–8  106A, MCC  Let’s Explore: The Changes That Surround Us (p. 98)
10:00–10:30 AM  K–8  103B, MCC  Building a Learning Garden While Integrating Literacy and Science (p. 104)
9:30–10:30 AM  6–12  105B, MCC  Climate Change Education Inside Out (p. 102)
9:30–10:30 AM  9–12  103A, MCC  From Memorization to Modeling—Reconceptualizing Teaching About Cellular Division (p. 101)
9:30–10:30 AM  9–12  105A, MCC  Cheap Investigations…Priceless Student Learning (p. 102)
9:30–10:30 AM  9–C  202B, MCC  Using Models and Motion for Teaching DNA and Protein Synthesis (p. 102)
9:30–10:30 AM  9–12  202C, MCC  Professional Learning Communities: An Interdisciplinary Collaboration between Secondary Science and Automotive Collision Repair Teachers (p. 102)
10:00–10:30 AM  K–8  101E, MCC  Using Web-Based Resources to Assist Diverse Learners to Learn Scientific Concepts While Engaging in Science Practices (p. 104)
11:00 AM–12 Noon  6–12  103A, MCC  Orchestrating a Scientific Symphony with the Three Dimensions of the NGSS (p. 108)
11:00 AM–12 Noon  5  104D, MCC  Cole’s Aquarium: Intentional Integration of Grade 5 Science and Math (p. 108)
11:00 AM–12 Noon  5–8/C  201B, MCC  Duck, Duck, Goose by the Numbers (p. 109)
11:00 AM–12 Noon  6–12  106A, MCC  Climate Change Research on the Arctic Tundra: Lessons and Labs from a Teacher at Toolik Field Station in Alaska (p. 106)
11:00 AM–12 Noon  9–12  202A, MCC  Biomagnification in Ocean Food Webs: You Are What You Eat (p. 109)
11:00 AM–12 Noon  4–8  104E, MCC  Managing Moving Molecules: A Hands-On Modeling Approach to Photosynthesis and Cellular Respiration (p. 108)

Physical Science: Saturday

8:00–8:30 AM  6–12  Broadway A, Omni  Dalton, Curie, Bohr, and More: A Chemistry Unit Outline (p. 16)
8:00–8:30 AM  P–6  101E, MCC  Connecting Interactive Science Notebooks and NGSS Practices: Early Childhood Students Engaging Their Community (p. 15)
8:00–9:00 AM  4–8  101 A/B, MCC  STEMulate Student Learning by Infusing Engineering Design Using the 6 Es (p. 20)
8:00–9:00 AM  P–1  105A, MCC  Fantastic Physical Science for Young Learners! (p. 21)
8:00–9:00 AM  5–C  Fisk Two, Renaissance  Deconstructing the Silos of Physical and Life Sciences in Grades 7–12 Classrooms (p. 19)
8:00–9:00 AM  6–8  Broadway D, Omni  At the Core of STEM: A Tale of Integrated Lessons for Middle School Students (p. 22)
8:00–9:00 AM  K–12  Legends G, Omni  Science Explorations with Deaf and Hard of Hearing Students (p. 22)
8:00–9:30 AM  K–8  110B, MCC  Cereal City Science: Going Great Lengths Toward the NGSS (p. 24)
8:00–9:30 AM  9–C  207C, MCC  Science with Vernier (p. 26)
8:00–9:30 AM  6–8  202C, MCC  Tracking Student Growth in Science Practices (p. 24)
8:00–9:30 AM  2–8  208B, MCC  Circuits as Crayons: Crafting Interactive Circuits with Circuit Stickers (p. 26)
8:00–9:30 AM  9–12  210, MCC  Living By Chemistry: Pass the Proton—Acids and Bases (p. 26)
8:30–9:00 AM  7–12  Broadway A, Omni  Simple Use of Scientific Models in High School Chemistry and Physical Science (p. 28)
9:30–10:30 AM  1–9  104E, MCC  Bringing Engineering, Technology, and Applications of Science into the Elementary and Middle School Classroom (p. 35)
9:30–10:30 AM  7–C  105A, MCC  Black Holes Suck! (p. 35)
9:30–10:30 AM  K–12  Mockingbird 4, Omni  Students Solving Real-World Problems (p. 34)
10:00–11:30 AM  2–8  202A, MCC  3-2-1 Blast Off! (p. 39)
10:00–11:30 AM  6–12  212, MCC  A Peek Behind the Curtain: Disney Parks Approach to Physics and Energy (p. 42)
10:00–11:30 AM  9–C  207C, MCC  Inquiry-Based Chemistry with Vernier (p. 40)
10:00–11:30 AM  9–12  209A, MCC  Enhance Your AP Chemistry Course with POGIL™ Activities (p. 41)
10:00–11:30 AM  6–8  205C, MCC  Waves (p. 40)
10:00–11:30 AM  9–12  206 A/B, MCC  Collisions™: Reconceptualizing Chemistry Through Gameplay (p. 40)
10:00–11:30 AM 9–C 208A, MCC NGSS in the High School Biology Classroom (p. 40)
11:00 AM–12 Noon 4–7 103C, MCC Come Fly with Us! (p. 49)
11:00 AM–12 Noon 6–8 106C, MCC Ocean Plastic Pollution: Examining Issues and Solutions in a Middle School Classroom (p. 50)
11:00 AM–12 Noon K–2 104B, MCC Sensing Science: Temperature and Heat Readiness for Early Elementary Students (p. 46)
11:00 AM–12 Noon 10–12 Broadway A, Omni Trials and Tribulations of Project-Based Learning: A Chemistry Team’s Vignette (p. 46)
11:00 AM–12 Noon 5–10 Electric, Omni Debatable Demos (p. 47)
11:00 AM–12 Noon 9–12 Broadway A, Omni Let’s Get Physical: From Force and Friction to Water and Weather (p. 50)
11:30 AM–12 Noon 12 Noon–1:30 PM 107B, MCC Spicing Up Classical Physics Using Modern Examples (p. 53)
12 Noon–1:30 PM 5–10 105B, MCC Designing Classroom Assessments to Address NGSS Performance Expectations (p. 58)
12 Noon–1:30 PM 5–9 105B, MCC Using Paper Airplane Design to Teach Scientific Investigations and the NGSS Engineering Practices (p. 83)
12 Noon–1:30 PM 6–8 209A, MCC Hands-On Integrated Science Activities for Middle School from Flinn Scientific (p. 54)
12 Noon–1:30 PM 6–8 202B, MCC Sparking Interest with Chemistry (p. 54)
12 Noon–1:30 PM 6–8 207A, MCC Let Motion Show How Cars May Really Drive Themselves in the Future with the ERGOBOT! (p. 54)
12 Noon–1:30 PM 9–12 207A, MCC Using the Tools of the NGSS to Reach Girls in Science (p. 82)
12 Noon–1:30 PM 9–C 207D, MCC Physics with Vernier (p. 54)
12:30–1:00 PM 5–9 103A, MCC Warm the Water to Save Your City: An Engineering and Educational Technology NGSS Student Assessment Task (p. 56)
12:30–1:00 PM 6–8 Broadway D, Omni Meet Me in the Middle Session: Engineering Practice in Middle School Chemistry (p. 58)
12:30–1:00 PM 8–12 214, MCC Constructing and Crossing Cell Membranes (p. 55)
12:30–1:00 PM 5–12 Fisk Two, Renaissance Problem Solving Through Observation: The Mystery of Three Turning Dots (p. 61)
12:30–1:00 PM 6–12 Broadway H, Omni Dive into Engineering Design: Connecting Physical Science and Engineering Through Underwater Robotics (p. 60)
12:30–1:00 PM 6–12 Cumberland 2, Omni Meeting the NGSS… Even When You Don’t Have To (p. 60)
12:30–1:00 PM 5–9 105B, MCC Designing Classroom Assessments to Address NGSS Performance Expectations (p. 58)
12:30–1:00 PM 4–5 104E, MCC Universal Design for Learning: A Powerful Way to Teach Electric Currents (p. 62)
12:30–1:00 PM 9–C 207A, MCC Keeping Things in Motion using NASA and Newton’s Laws (p. 83)
12:30–1:00 PM 1–6 207A, MCC Differentiating Content, Process, and Product: Examples from Earth History, Ecology, Force and Motion, and Astronomy Units (p. 80)
12:30–1:00 PM 3–C Center Blrm., Renaissance Exploring Light and Color: Hands-On NGSS-Based Investigations from the Exploratorium (p. 64)
1:00–1:30 PM 6–10 104C, MCC Rhythm and Blues: Exploring the Science of Sound (p. 82)
1:15–1:45 PM 4–10 Broadway A, Omni Meet Me in the Middle Session: Earworms and Melodies: Teaching Science Through Songs (p. 66)
2:00–3:00 PM 101E, MCC Designing Animals to Survive Cold Temperatures (p. 71)
2:00–3:00 PM 105B, MCC Engaging Chemistry Students Through Forensics Investigations (p. 72)
2:00–3:00 PM 1–6 207A, MCC Elementary Science Activity Jamboree (p. 74)
3:30–4:30 PM 6–12 Cumberland 1, Omni Differentiating Content, Process, and Product: Examples from Earth History, Ecology, Force and Motion, and Astronomy Units (p. 80)
3:30–4:30 PM 8–12 Cumberland 3, Omni Mastery Learning that Provides Choice and Changes Perception (p. 80)
4:00–5:30 PM 9–12 207A, MCC A Cross-Curricular Contamination Case: Integrating Core Content Through Self-Paced Learning (p. 86)
4:00–5:30 PM K–8 207A, MCC Physics of Music (p. 84)
4:00–5:30 PM 5–10 103C, MCC The Maker Movement in EC–Grade 8 Classrooms (p. 86)
5:00–6:00 PM 9–11 103C, MCC A Cross-Curricular Contamination Case: Integrating Core Content Through Self-Paced Learning (p. 86)
### Schedule at a Glance

**Physical Science**

<table>
<thead>
<tr>
<th>Time</th>
<th>Venue</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:00–6:00 PM</td>
<td>P–2 104C, MCC</td>
<td>Ramps and Pathways: An Integrated STEM Activity (p. 88)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>3–8 104E, MCC</td>
<td>Sound and Waves: An Integrated K–8 Hands-On Approach Supporting the NGSS and CCSS ELA (p. 88)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>4–12 Legends A, Omni</td>
<td>Riding the Waves (p. 88)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>6–12 Legends E, Omni</td>
<td>CRASH Science! Investigating the Dangers of Distracted Driving (p. 88)</td>
</tr>
<tr>
<td>5:30–6:00 PM</td>
<td>P–2 104B, MCC</td>
<td>Think It, Map It, Write It, Learn It! (p. 90)</td>
</tr>
<tr>
<td>5:30–6:00 PM</td>
<td>8–12 Music Row 1, Omni</td>
<td>Are You Bohr’d with Bonding? (p. 90)</td>
</tr>
</tbody>
</table>

#### Physical Science: Sunday

<table>
<thead>
<tr>
<th>Time</th>
<th>Venue</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>7–12 205A, MCC</td>
<td>Science Is a Social Endeavor: Scientific Inquiry Through Collaborative Work (p. 97)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>K–12 202B, MCC</td>
<td>Illuminate Intelligence with Creative Circuits (p. 97)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>9–12 207C, MCC</td>
<td>Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events (p. 94)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>9–12 201B, MCC</td>
<td>Hot Topics Workshop: Nuclear Energy (p. 97)</td>
</tr>
<tr>
<td>9:30–10:00 AM</td>
<td>4–8 106A, MCC</td>
<td>Let’s Explore: The Changes That Surround Us (p. 98)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–12 207B, MCC</td>
<td>Integrating Reading and Math in the Science Curriculum to Increase Student Achievement (p. 100)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>9–12 202C, MCC</td>
<td>Professional Learning Communities: An Interdisciplinary Collaboration between Secondary Science and Automotive Collision Repair Teachers (p. 102)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–12 209B, MCC</td>
<td>Something Worth Writing About: Using Literacy Techniques to Engage More Students in STEM (p. 104)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>7–12 208B, MCC</td>
<td>From Silos to STEM: Developing Real Thinkers (p. 104)</td>
</tr>
<tr>
<td>10:00–10:30 AM</td>
<td>9–C 101E, MCC</td>
<td>Using Web-Based Resources to Assist Diverse Learners to Learn Scientific Concepts While Engaging in Science Practices (p. 104)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>10–12 101C, MCC</td>
<td>NSTA Press® Session: Forensics in Chemistry (p. 105)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>5–12 103B, MCC</td>
<td>Energize Your Classroom while Teaching Tough Science Concepts (p. 108)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>6–8 205B, MCC</td>
<td>Integrating Digital Games into Instruction to Address Crosscutting Concepts (p. 106)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>9–C 202B, MCC</td>
<td>Science and Engineering Practices in the Chemistry Classroom (p. 109)</td>
</tr>
</tbody>
</table>
Schedule at a Glance

Earth and Space Science

— Photo courtesy of Jacob Slaton
### Index of Participants

#### A
- Adams, Krista 101
- Adams, Paul 73
- Adkins, Jeffery 35
- Aguilar, Juan-Carlos 76
- Albers-Lopez, Tiffany 46
- Allan, Elizabeth 70
- Allan, Kara 31
- Allan, Richard 39
- Allesio, Jennifer 86
- Almasi, Kama 31
- Angle, Julie 90
- Ansberry, Karen 20
- Arakawa, Garrett 49
- Ashbrook, Peggy 88
- Asplund, Shari 20
- Baird, Kate 18, 34
- Baker, Samantha 15
- Ballard, Melissa 18
- Banko, William 68
- Baptiste, Pamela 63
- Barden-Gabbei, Laura 104
- Barrett, Donna 108
- Barrett, Joanne 100
- Barrow, Lloyd 82
- Barstow, Dan 86
- Bartley, Tony 72
- Be, Erin 31
- Beard, Todd 23, 65
- Beckendorf, Kirk 108
- Bedell, Sean 31
- Bednarski, Marsha 65
- Bell, Philip 50
- Bell, Randy 102
- Bemiss, Allison 28
- Berent, Rusti 40
- Berg, Alissa 22
- Bertino, Anthony 80
- Bertino, Patricia Nolan 80
- Betts, Cameron 24
- Bickerstaff, Amanda 40
- Bierema, Andrea 76
- Biernat, Kathy 29, 44
- Bigney, Betty 96
- Bilash, Borislaw 78
- Bindus, Cheryl 78
- Birts, Teshia 47
- Bjorklund, Kate 98
- Bjorklund, Martha 98
- Bierema, Andrea 40
- Bickerstaff, Amanda 40
- Bierema, Andrea 76
- Biernat, Kathy 29, 44
- Bigney, Betty 96
- Bilash, Borislaw 78
- Bindus, Cheryl 78
- Birts, Teshia 47
- Bjorklund, Kate 98
- Bjorklund, Martha 98

#### B
- Baird, Kate 18, 34
- Baker, Samantha 15
- Ballard, Melissa 18
- Banko, William 68
- Baptiste, Pamela 63
- Barden-Gabbei, Laura 104
- Barrett, Donna 108
- Barrett, Joanne 100
- Barrow, Lloyd 82
- Barstow, Dan 86
- Bartley, Tony 72
- Be, Erin 31
- Beard, Todd 23, 65
- Beckendorf, Kirk 108
- Bedell, Sean 31
- Bednarski, Marsha 65
- Bell, Philip 50
- Bell, Randy 102
- Bemiss, Allison 28
- Berent, Rusti 40
- Berg, Alissa 22
- Bertino, Anthony 80
- Bertino, Patricia Nolan 80
- Betts, Cameron 24
- Bickerstaff, Amanda 40
- Bierema, Andrea 76
- Biernat, Kathy 29, 44
- Bigney, Betty 96
- Bilash, Borislaw 78
- Bindus, Cheryl 78
- Birts, Teshia 47
- Bjorklund, Kate 98
- Bjorklund, Martha 98

#### C
- Cain, Dennis 70
- Cain, Tracie 97
- Callaghan, Elizabeth 109
- Callaway, Miller 108
- Callender, Lionel 32
- Camins, Arthur 60
- Cannon, Kristie 94
- Caplan, Marcelo 96
- Cardello, Joseph 42
- Carlisle, Cher 65, 77
- Carter, David 40, 54
- Carter, Sarah 57, 82
- Casanova, Donna 53
- Casey, Jennifer 102
- Chandrasekhar, Meera 83
- Chang, Stephanie 72
- Charles, Deborah 32
- Cheung, Caleb 48, 108
- Chickadel, Deb 35
- Christiansen, Elizabeth 104
- Christie-Blick, Kathleen 97
- Cilick, Ryan 74
- Clark, John 81
- Clawson, Megan 78
- Clay, Susan 87
- Clinchot, Michael 106
- Cobb, Whitney 20
- Codron, Angela 105
- Coleman, Elizabeth 82
- Coleman, Natalie 45
- Coleman, Sarah 83
- Colestock, Adam 28
- Collins, Darrin 23
- Colwell, Mandy 71
- Cook, Linda 58
- Cook-Endres, Tammy 46
- Cooper, Susan 70
- Copley, Billie 53
- Corratti, Jan 49
- Corkery, Jill 30
- Cost, Diana 43, 44
- Coy, Stephanie 18, 34
- Crowell, Juliet 104
- Crowther, David 20
- Cushing, Matthew 36
- Custer, Alexis 86

#### D
- DasGupta, Shumit 108
- Daugherty, Ellyn 27
- Davis, Brian 109
- Davis, Melissa 19
- Deck, Anita 20
- Denman, Marie 104
- Denton, Dana 21
- Detwiler, Michele 108
- Devitt, Adam 68
- DiGiuseppe, Maurice 94
- Dinkelmann, William 39
- DiSpezio, Michael 24, 74
- DiStefano, Rachelle 52
- Donkers, Kevin 38
- Donna, Joel 56
- Dorsey, Chad 18
- Douglas, Jan 49
- Dowling, Jeffrey 26
- Duncan, Ravi Golan 45
- Dunlop, Nealy 43, 66
- Dunn, Emily 102
- Dwyer, Kathleen 97
- Dyasi, Hubert 96
- Dyasi, Rebecca 96
- Dye, Jennifer 70
- Dye, Lisa 98
- Dykstra, Janet 26
- Eales, Sarah 57
- Eckels, Lacey 19
- Edwards, Amtchat 43, 56
- Eilers, Alex 32
- Eilert, Kathryn 81
- Ellsworth, Darrin 28
- Erickson, Ryan 39
- Ervin, Jeremy 77
- Evans, David L. 78
- Evans, Zoe 27

#### F
- Farmer, Sheri 62
- Feagin, Shannon 101
- Fee, Jennifer 38
- Fernandez, Jacqueline 56, 60
- Fetterhoff, Amy 20
- Fields, Ashley 19
- Fields, Ronda 19
- Finzer, William 52
- Fischer, Melissa 22
- Fleming, Michelle 15, 98
- Flowers, Jenny 100
- Folkes, Caitlin 48
- Fonner, Linda 108
- Foote, Nancy 72
- Forman, George 46
- Fouk, Jaimie 106
- Fowler, Jonathan 109
- Francis, Kenneth 54
- Franzen, Margaret 42, 55
- Frazier, Don 48
- Frazier, Richard 16, 47
- Freeland, Emily 86
- Freeman, Branie 60
- Fuert, Rebekah 48
- Fulco, Charles 32
- Fulton, Lori 28, 32
Index of Participants

G
Gaither, Jessica 34
Gajdzik, Elizabeth 101
Garaventa, Jamie 109
Gardner, Margery 30
Garner, Dave 37
German, Susan 45
Gill, Kathleen 88
Gillespie, Jean 102
Gillstrom, Kelly 62
Glanston, Grace 38
Gleason, Joyce 87
Glogowski, Walter 21
Gobert, Janice 24
Goldstein, Jeff 19
Gonzalez, Adaliz 22, 70
Gooch, Helen 38, 77
Goodwin, Debbie 94
Goodwin, Timothy 57, 64
Gottlieb, Jennifer 19
Gould, Deena 49, 73
Governor, Donna 31, 66
Gran, Susan 80
Greatheart, Paula 18
Green, Stephanie 38
Greenler, John 35
Griesemer, Chris 82
Griffin, Maureen 22
Griffin-Wenzel, Michelle 80
Gullett, L. Paige 34
Gurman, Gennadyi 18
Gutierrez, Joe 58
Guy, Candice 82
Guzzetta, Beth 98

H
Hafza, Rabieh 61
Hagins, Whitney 63
Hall, Alfred II 20
Hall, Cynthia 46
Hall, Eric 22
Hamilton, Brian 71
Hamilton, Robert 48
Hammond, Jennifer 44
Hanson, Kim 105
Hanuschin, Deborah 62, 76
Harcourt, Pat 102
Harmon, Stephanie 94
Harris, Renard 46
Harris, Roy 70
Harris, Tina 110
Harrison, Molly 66
Harte, Tina 20
Hartley, Susan 90
Hartman, Matthew 43
Hashimoto-Martell, Erin 106
Hawkins, Margie 70
Hawthorne, Stephanie 90
Hayes, Laurie 90
Hayes, Matthew 57
Hedman, Rich 82
Hef, John 72
Hehr, Lynne 72
Heintz, Julie 76
Hightman, Cheryl 102
Helm, David 33
Heng, Megan 85
Henry, Paul 17
Heydrick, Kenn 47
Higdon, Robbie 38, 60
Higgins, Teresa 71, 98
Hill, Kevin 62
Hillman, Peter 19
Hillyer, Patricia 72
Hines, Marla 16
Hines, S. Maxwell 73
Hirsch, Leah 52
Hobbs, Mary 53
Hodge, Tiffany 18
Hodson, Michele 61
Hoekenga, Janet 54
Hoier, Nikki 86
Holm, Sara 98
Holmes, Jay 35
Holzer, Margaret 60, 83
Hong, Young 101
Hooer, Todd 43, 44, 76
Hopkins, Stephanie 72
Hottle, Stacia 64
Houseal, Ana 81
Hubenthal, Michael 49
Huddleston, Denise 108
Huff, Kenneth 43
Huffman, Louise 30
Hug, Barbara 63, 101
Hughes, Lee 58, 70
Hutchinson, Kathryn 35
Huth, Barbara 94
Hutton, Judith 29

I
Iocoangeli, Amanda 78

J
Jackson, Laura 42, 55, 75
Jackson, Whitney 100
Jacobs, Elana 36
Jacobs, Karen 86
Jaggar, Louise 53
Jaffreys, Jessica 30
Jenoure, Sandra 70
Jens, Mallory 19
Jezsdja-Kendall, Katherine 18
Jhun, Youngsook 61
Johal, Alicia 53, 81
Johnson, Barbara 49
Johnson, Candyce 29
Johnson, Craig 57
Johnson, David E. 32
Johnson, Heather J. 15, 67
Johnson, Jeff 83
Johnson, Trudy 108
Johnston, Maggie 39
Jones, Griff 88
Jones, Linda 88
Jordan, Janet 93
Jordan, Linda 70
Julien, Jude 40

K
Kah, Linda 45
Kahn, Sami 73
Kanaplesky, Amy 86
Karl, Rita 57, 82
Karrer, Nancy 24
Keating, Stephanie 38
Keeley, Page 82, 101
Keeling, Ashley 100
Keith, Karin 88
Kelly, Susan 97
Kelsey, Martin 28
Kennedy, Kathy 48
Kern, Cynthia 87
Kerwin, Sean 19
Kessler, James 58
Khan, Seema 97
Kincaid, Patricia 19
Kling, Sarah 81
Kleiner, David 50
Klimowicz, Britanny 85
Kline, Zachary 57
Kling, Pamela 105
Klode, Rachel 85
Knippenberg, Lindsay 94
Koba, Susan 50
Kohl, Laurel 44, 97
Kohout, Jessica 97
Koker, Mark 24, 40
Koller, Herb 42
Kolonic, Angela 84
Komada, Ted 58
Koppendrayer, Susan 56
Korb, Mike 52
Kosztin, Dorina 83
Krajcik, Joseph 45
Kruse, Brian 101
Kuhn, Mason 28
Kurson, Rebecca 62
Kutsunai, Beverly 82

L
Lagas, Ashley 48
Lamprecht, Frieda 105
Lanham, J. Drew 31
Lanotte, April 61, 104
Lardy, Corinne 52
Lauren, Hillary 63
Laurence, Brittnee 73
Lauterbach, Lynn 87
LeDuc, Danika 52
Leonard, Ruth 71
Lessner, Susan 76
Letson, Jenny 52
Levine, Samantha 97
Lewis, Amber 83
Lewis, Jill 43, 44
Lewis, Melissa 83
Lightbody, Mary 62
Lindeman, Cheryl 87
Lindgren, Samantha 62
Lipscomb, Mary Lou 43, 44
Lockhart, Julie 46
Logan, Katie 84
Long, Cheryl 43
Loper, Suzanna 90
Loschiavo, Tom 43, 44
Lott, Kimberly 90
Love, Tyler 34
Lubchenco, Peggy 74
Lucas-Odom, Judith 36, 104
Lukens, Jeffrey 25, 50, 80
Lum, Nicole 22
Lux, Nicholas 28
### Index of Participants

<table>
<thead>
<tr>
<th>Index of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M</strong></td>
</tr>
<tr>
<td>Ma, Jingjing 105</td>
</tr>
<tr>
<td>MacCarthy, James 74</td>
</tr>
<tr>
<td>MacColl, Jen 30</td>
</tr>
<tr>
<td>Mackenzie, Ann Haley 77</td>
</tr>
<tr>
<td>MacNeil, Janet 80</td>
</tr>
<tr>
<td>Mahmoud, Ramy 61</td>
</tr>
<tr>
<td>Maier, Frederick 70, 86</td>
</tr>
<tr>
<td>Martin, Dean 61</td>
</tr>
<tr>
<td>Martin-Hansen, Lisa 76</td>
</tr>
<tr>
<td>Massey, Vicki 34, 46, 66</td>
</tr>
<tr>
<td>Mastronicola, Tracie 67</td>
</tr>
<tr>
<td>Matson, Clea 108</td>
</tr>
<tr>
<td>Matthews, Diane 86</td>
</tr>
<tr>
<td>Matys, Jaime 104</td>
</tr>
<tr>
<td>Maur, Bonnie 16</td>
</tr>
<tr>
<td>Maze, Patricia 96</td>
</tr>
<tr>
<td>McAllister, Deborah 44</td>
</tr>
<tr>
<td>McAllister, Meredith 110</td>
</tr>
<tr>
<td>McAuliffe, Carla 33, 60, 72</td>
</tr>
<tr>
<td>McBeath, Deanna 86</td>
</tr>
<tr>
<td>McCleave, Melissa 90</td>
</tr>
<tr>
<td>McCleary, Tyler 54</td>
</tr>
<tr>
<td>McCray, Willie 46</td>
</tr>
<tr>
<td>McDaniel, Colleen 54</td>
</tr>
<tr>
<td>McDermott, Mark 28</td>
</tr>
<tr>
<td>McDermott, Stefanie 75</td>
</tr>
<tr>
<td>McDonnell, Ann Marie 34</td>
</tr>
<tr>
<td>McDiarmid, Alicia 30</td>
</tr>
<tr>
<td>McGhee, Emily 96</td>
</tr>
<tr>
<td>McGee, Steven 64</td>
</tr>
<tr>
<td>McGeehan, Miles 28</td>
</tr>
<tr>
<td>McGee-Tekula, Randi 64</td>
</tr>
<tr>
<td>McGhee, Dedric 104</td>
</tr>
<tr>
<td>McGinnis, Patty 43, 44</td>
</tr>
<tr>
<td>McKenna, Acacia 44</td>
</tr>
<tr>
<td>McKenna, Thomas 15</td>
</tr>
<tr>
<td>McKnight, Mary Elizabeth 33</td>
</tr>
<tr>
<td>McLaren, Peter 78</td>
</tr>
<tr>
<td>McLaughlin, Lisa 78</td>
</tr>
<tr>
<td>McMullen, Cynthia 65</td>
</tr>
<tr>
<td>McMurty, Angela 18</td>
</tr>
<tr>
<td>McQuillan, Patrick 88</td>
</tr>
<tr>
<td>McRae, Nicole 58</td>
</tr>
<tr>
<td>Melville, John 74</td>
</tr>
<tr>
<td>Mendillo, Johanna 106</td>
</tr>
<tr>
<td>Menning, Jordan 22</td>
</tr>
<tr>
<td>Mentillo, Holly 96</td>
</tr>
<tr>
<td>Michielli-Pendel, Jean 65</td>
</tr>
<tr>
<td>Milenkovic, Lisa 58</td>
</tr>
<tr>
<td>Milks, Kirstin 97</td>
</tr>
<tr>
<td>Miller, Brant 98</td>
</tr>
<tr>
<td>Miller, Jennifer 19</td>
</tr>
<tr>
<td>Millwood, Emily 52</td>
</tr>
<tr>
<td>Milo, Heather 27</td>
</tr>
<tr>
<td>Minton, Jessica 58</td>
</tr>
<tr>
<td>Mirabella, Matthew 35</td>
</tr>
<tr>
<td>Mohr, Chris Embry 27</td>
</tr>
<tr>
<td>Mook, Nathan 16</td>
</tr>
<tr>
<td>Moore, Danielle 100</td>
</tr>
<tr>
<td>Moran, Renee 88</td>
</tr>
<tr>
<td>Moravchik, Bruce 66</td>
</tr>
<tr>
<td>Morey, Shannon 80</td>
</tr>
<tr>
<td>Morgan, Emily 20</td>
</tr>
<tr>
<td>Morrison, Deb 19</td>
</tr>
<tr>
<td>Morrison, Katie 35</td>
</tr>
<tr>
<td>Moyer, Richard 43</td>
</tr>
<tr>
<td>Mulkerrin, Elizabeth 47</td>
</tr>
<tr>
<td>Muller, Eric 64, 104</td>
</tr>
<tr>
<td>Murador-Cobb, Molly 78</td>
</tr>
<tr>
<td>Murphy, Amy 16</td>
</tr>
<tr>
<td>Mury, Michael 62, 109</td>
</tr>
<tr>
<td>Muscatello, Patty 74</td>
</tr>
<tr>
<td>Myers, Fred 68</td>
</tr>
<tr>
<td><strong>N</strong></td>
</tr>
<tr>
<td>Nagy, Katie 28</td>
</tr>
<tr>
<td>Nakagori, Gary 73</td>
</tr>
<tr>
<td>Narvaez, James 86</td>
</tr>
<tr>
<td>Naylor, Amy 65</td>
</tr>
<tr>
<td>Neal, Ted 34</td>
</tr>
<tr>
<td>Neesemann, Lisa 19</td>
</tr>
<tr>
<td>Newberry, Debra 53</td>
</tr>
<tr>
<td>Ng, Patricia 26</td>
</tr>
<tr>
<td>Nickerson, LeeAnn 82</td>
</tr>
<tr>
<td>Nicolette, Jim 39</td>
</tr>
<tr>
<td>Niepold, Frank 77</td>
</tr>
<tr>
<td>Nocella, Michael 17</td>
</tr>
<tr>
<td>Noel-Storr, Jake 22, 36</td>
</tr>
<tr>
<td>Nolan-Basley, Pamela 21</td>
</tr>
<tr>
<td>Novak, Elizabeth 108</td>
</tr>
<tr>
<td>Numedahl, Paul 22, 36, 52</td>
</tr>
<tr>
<td>Nydam, Andrew 106</td>
</tr>
<tr>
<td>Nye, Leth 35</td>
</tr>
<tr>
<td>Nyren, Lois 65</td>
</tr>
<tr>
<td><strong>O</strong></td>
</tr>
<tr>
<td>Obenour, Patti 23</td>
</tr>
<tr>
<td>O’Brien, Thomas 68, 96</td>
</tr>
<tr>
<td>O’Connell, Liss 63</td>
</tr>
<tr>
<td>O’Connor, Tami 39</td>
</tr>
<tr>
<td>O’Dell, Kimberly 21</td>
</tr>
<tr>
<td>Ohl, Roxane 26</td>
</tr>
<tr>
<td>Olson, Julie 27</td>
</tr>
<tr>
<td>O’Neil, Nicole 49</td>
</tr>
<tr>
<td>Oney, Matthew 84</td>
</tr>
<tr>
<td>Ortmann, Alissa 39</td>
</tr>
<tr>
<td>Osheroff, Hilleary 46</td>
</tr>
<tr>
<td><strong>P</strong></td>
</tr>
<tr>
<td>Padalino, Jack 31</td>
</tr>
<tr>
<td>Pagan, Michelle 25</td>
</tr>
<tr>
<td>Palz, Keith 109</td>
</tr>
<tr>
<td>Panczyzyn, Jennifer 109</td>
</tr>
<tr>
<td>Panjwani, Alisha 26</td>
</tr>
<tr>
<td>Papp, Ali 39</td>
</tr>
<tr>
<td>Pappas, John 100</td>
</tr>
<tr>
<td>Pappas, Kristina 31</td>
</tr>
<tr>
<td>Parisi, Maria 42, 54</td>
</tr>
<tr>
<td>Pasquare, Marian 106</td>
</tr>
<tr>
<td>Passmore, Cynthia 82</td>
</tr>
<tr>
<td>Passow, Michael 35, 60, 72, 83</td>
</tr>
<tr>
<td>Patiel, Valerie 86</td>
</tr>
<tr>
<td>Patterson, Tonya 72</td>
</tr>
<tr>
<td>Paulson, Patricia 71</td>
</tr>
<tr>
<td>Payo, Robert 46</td>
</tr>
<tr>
<td>Peacock, Jeremy 27</td>
</tr>
<tr>
<td>Pearson, Greg 88</td>
</tr>
<tr>
<td>Pearson, Mindy 108</td>
</tr>
<tr>
<td>Peck, Phaela 90</td>
</tr>
<tr>
<td>Peddi, Erica 80</td>
</tr>
<tr>
<td>Peel, Wendy 43, 44</td>
</tr>
<tr>
<td>Pelkey, Heather 62</td>
</tr>
<tr>
<td>Pelletier, Pamela 33</td>
</tr>
<tr>
<td>Penn, Betsy 21</td>
</tr>
<tr>
<td>Peniel, William 50</td>
</tr>
<tr>
<td>Pepperman, Julie 56</td>
</tr>
<tr>
<td>Peters, Alison 98</td>
</tr>
<tr>
<td>Peterson, Barney 70</td>
</tr>
<tr>
<td>Phelps, Kyle 15</td>
</tr>
<tr>
<td>Pistorius, Carolyn 52</td>
</tr>
<tr>
<td>Plank, Larry 32</td>
</tr>
<tr>
<td>Pope, Damian 53</td>
</tr>
<tr>
<td>Pope, Margaret 109</td>
</tr>
<tr>
<td>Popiolkowski, Gary 70</td>
</tr>
<tr>
<td>Popovich, Amanda 100</td>
</tr>
<tr>
<td>Powers, Donald 35</td>
</tr>
<tr>
<td>Presley, Lucinda 105</td>
</tr>
<tr>
<td>Pressel, Alicia 64</td>
</tr>
<tr>
<td>Price-Colley, Kelly 48, 61</td>
</tr>
<tr>
<td>Putnam, Dwight “Buzz” 71</td>
</tr>
<tr>
<td><strong>Q</strong></td>
</tr>
<tr>
<td>Quigley, Kathryn 90</td>
</tr>
<tr>
<td><strong>R</strong></td>
</tr>
<tr>
<td>Ramdass, Derek 32</td>
</tr>
<tr>
<td>Ramey, Kelly 28</td>
</tr>
<tr>
<td>Randall, Jack 26, 40</td>
</tr>
<tr>
<td>Randle, David 46</td>
</tr>
<tr>
<td>Randolph, Keri 46</td>
</tr>
<tr>
<td>Raygor, Brian 62</td>
</tr>
<tr>
<td>Read, Jacob 19</td>
</tr>
<tr>
<td>Rearden, Kristin 82</td>
</tr>
<tr>
<td>Reason, Shaun 67</td>
</tr>
<tr>
<td>Reed, Kyle 78</td>
</tr>
<tr>
<td>Reeves, Marion 33</td>
</tr>
<tr>
<td>Regalla, Lisa 72</td>
</tr>
<tr>
<td>Reichsman, Frieda 18</td>
</tr>
<tr>
<td>Reinhart, Thomas 34, 71</td>
</tr>
<tr>
<td>Reis, Scott 60</td>
</tr>
<tr>
<td>Rentfro, Lauren 46</td>
</tr>
<tr>
<td>Riccio, Jessica 19</td>
</tr>
<tr>
<td>Rich, Steve 49</td>
</tr>
<tr>
<td>Richardson, Brian 101</td>
</tr>
<tr>
<td>Riedinger, Kelly 75</td>
</tr>
<tr>
<td>Riffkin, Moses 101</td>
</tr>
<tr>
<td>Rigney, William 81</td>
</tr>
<tr>
<td>Rivas, Mike 96</td>
</tr>
<tr>
<td>Rivet, Ann 19, 45</td>
</tr>
<tr>
<td>Roberts, Ken 48</td>
</tr>
<tr>
<td>Roberts-Harris, Deborah 29, 37, 53, 57, 67, 77</td>
</tr>
<tr>
<td>Robertson, Carol 102</td>
</tr>
<tr>
<td>Robertson, Laura 88</td>
</tr>
<tr>
<td>Robichaux-Davis, Rebecca 109</td>
</tr>
<tr>
<td>Robinson, Randy 42, 54</td>
</tr>
<tr>
<td>Rocha, Robert 36</td>
</tr>
<tr>
<td>Rode, Alex 109</td>
</tr>
<tr>
<td>Roghaa, Deborah 90</td>
</tr>
<tr>
<td>Roman, Suzanna 76</td>
</tr>
<tr>
<td>Romero, Enrique 84</td>
</tr>
<tr>
<td>Rosa, Holly 33</td>
</tr>
<tr>
<td>Ross, Elizabeth 86</td>
</tr>
<tr>
<td>Ross, Sonnie-Dae 64, 71</td>
</tr>
<tr>
<td>Rossier, Laura 93</td>
</tr>
<tr>
<td>Rowe, Monica 56</td>
</tr>
<tr>
<td>Roy, Kenneth 34, 56</td>
</tr>
<tr>
<td>Royce, Christine Anne 96</td>
</tr>
<tr>
<td>Russell, Randy 63</td>
</tr>
<tr>
<td>Ruud, Ruth 50</td>
</tr>
<tr>
<td>Ryack-Bell, Sandra 36</td>
</tr>
<tr>
<td>Ryan, Denise 42</td>
</tr>
<tr>
<td>Saddler, Jillian 41</td>
</tr>
<tr>
<td>Sadler, Philip 106</td>
</tr>
<tr>
<td>Name</td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
<tr>
<td>Sagely, Andrea</td>
</tr>
<tr>
<td>Sale, Nancy</td>
</tr>
<tr>
<td>Salim, Ingrid</td>
</tr>
<tr>
<td>Sanabáñez, David</td>
</tr>
<tr>
<td>Sard, Katie</td>
</tr>
<tr>
<td>Sarquis, A. Mickey</td>
</tr>
<tr>
<td>Sarquis, Jerry</td>
</tr>
<tr>
<td>Sarria, Deborah</td>
</tr>
<tr>
<td>Savage, Elizabeth</td>
</tr>
<tr>
<td>Sawa, Blair</td>
</tr>
<tr>
<td>Saxen, Colleen</td>
</tr>
<tr>
<td>Schaffer, Dannah</td>
</tr>
<tr>
<td>Schatz, Dennis</td>
</tr>
<tr>
<td>Scheer, Amy</td>
</tr>
<tr>
<td>Schmidt, Kelly</td>
</tr>
<tr>
<td>Schoene, Melissa</td>
</tr>
<tr>
<td>Schupp, Kara</td>
</tr>
<tr>
<td>Schuster, David</td>
</tr>
<tr>
<td>Scimone, Brianna</td>
</tr>
<tr>
<td>Sebestik, Jana</td>
</tr>
<tr>
<td>Selkirk, Kate</td>
</tr>
<tr>
<td>Selle, Kirby</td>
</tr>
<tr>
<td>Sellers, Robyn</td>
</tr>
<tr>
<td>Shae, Mary</td>
</tr>
<tr>
<td>Shae, Pat</td>
</tr>
<tr>
<td>Shapiro, Lesley</td>
</tr>
<tr>
<td>Sharack, Stuart</td>
</tr>
<tr>
<td>Shaw, Robert</td>
</tr>
<tr>
<td>Shell, Leonora</td>
</tr>
<tr>
<td>Sherman, Vanessa</td>
</tr>
<tr>
<td>Shoup, Scott</td>
</tr>
<tr>
<td>Sidhu, Sanya</td>
</tr>
<tr>
<td>Siegel, Jeremy</td>
</tr>
<tr>
<td>Simeon, Cezar</td>
</tr>
<tr>
<td>Simon, Eileen</td>
</tr>
<tr>
<td>Sincerbeaux, Charles</td>
</tr>
<tr>
<td>Sleeper, Melissa</td>
</tr>
<tr>
<td>Smit, Jennifer</td>
</tr>
<tr>
<td>Smith, Kelly</td>
</tr>
<tr>
<td>Smith, Linda</td>
</tr>
<tr>
<td>Smith, Pat</td>
</tr>
<tr>
<td>Smithenry, Dennis</td>
</tr>
<tr>
<td>Sneider, Cary</td>
</tr>
<tr>
<td>Solarsh, Amanda</td>
</tr>
<tr>
<td>Solomon, Gerald</td>
</tr>
<tr>
<td>Son, Hyunjin</td>
</tr>
<tr>
<td>Sonnert, Gerhard</td>
</tr>
<tr>
<td>Spielmaker, Debra</td>
</tr>
<tr>
<td>Spohler, Scott</td>
</tr>
<tr>
<td>Stallard, Jaclyn</td>
</tr>
<tr>
<td>St. Amand, Ronald</td>
</tr>
<tr>
<td>Stanley, Rick</td>
</tr>
<tr>
<td>Staudenraus, Charity</td>
</tr>
<tr>
<td>Staudt, Carolyn</td>
</tr>
<tr>
<td>Steffen, Peg</td>
</tr>
<tr>
<td>Steiner, Robert</td>
</tr>
<tr>
<td>Steiner, Susan</td>
</tr>
<tr>
<td>Steinman, Melissa</td>
</tr>
<tr>
<td>Stenger, Stephanie</td>
</tr>
<tr>
<td>Stephens, Deb</td>
</tr>
<tr>
<td>Stevenson, Corinne</td>
</tr>
<tr>
<td>Stilwell, Duane</td>
</tr>
<tr>
<td>Stratton, Stephanie</td>
</tr>
<tr>
<td>Strobel, Johannes</td>
</tr>
<tr>
<td>Stroh, Justin</td>
</tr>
<tr>
<td>Stronach, Rachel</td>
</tr>
<tr>
<td>Strong, Elizabeth</td>
</tr>
<tr>
<td>Strong, Robert</td>
</tr>
<tr>
<td>Sullivan, Holly</td>
</tr>
<tr>
<td>Sullivan, Kelsey</td>
</tr>
<tr>
<td>Sullivan, Sandra</td>
</tr>
<tr>
<td>Szopinski, Alison</td>
</tr>
<tr>
<td>Taber, John</td>
</tr>
<tr>
<td>Tai, Chiho</td>
</tr>
<tr>
<td>Tanaka, Annette</td>
</tr>
<tr>
<td>Tanenbaum, Jacob</td>
</tr>
<tr>
<td>Taterka, Bruce</td>
</tr>
<tr>
<td>Taylor, Gregory</td>
</tr>
<tr>
<td>Teisan, June</td>
</tr>
<tr>
<td>Tesoriero, Gina</td>
</tr>
<tr>
<td>Texley, Juliana</td>
</tr>
<tr>
<td>Thomas, Jay</td>
</tr>
<tr>
<td>Thomas, Jeff</td>
</tr>
<tr>
<td>Thompson, Michele</td>
</tr>
<tr>
<td>Tidwell, April</td>
</tr>
<tr>
<td>Tierney, Susan</td>
</tr>
<tr>
<td>Tillotson, John</td>
</tr>
<tr>
<td>Tirado, Shana</td>
</tr>
<tr>
<td>Traphagen, Stephen</td>
</tr>
<tr>
<td>Trumbauer, Tim</td>
</tr>
<tr>
<td>Tufts, Sylvia</td>
</tr>
<tr>
<td>Tugel, Joyce</td>
</tr>
<tr>
<td>Tunstall, Donald</td>
</tr>
<tr>
<td>Tuohy, Brenda</td>
</tr>
<tr>
<td>Turrin, Margie</td>
</tr>
<tr>
<td>Tweed, Anne</td>
</tr>
<tr>
<td>Tyler, Reginald</td>
</tr>
<tr>
<td>Ufnar, Jennifer</td>
</tr>
<tr>
<td>Umeda, Karen</td>
</tr>
<tr>
<td>Upton, Amanda</td>
</tr>
<tr>
<td>Ulfar, Jennifer</td>
</tr>
<tr>
<td>Van Horne, Katie</td>
</tr>
<tr>
<td>Van Meeteren, Beth</td>
</tr>
<tr>
<td>Vargas, Claudio</td>
</tr>
<tr>
<td>Velez, Diana</td>
</tr>
<tr>
<td>Venturino, Marielle</td>
</tr>
<tr>
<td>Vernier, Dave</td>
</tr>
<tr>
<td>Vernot, David</td>
</tr>
<tr>
<td>Villa, Carlos</td>
</tr>
<tr>
<td>Vincente, Joseph</td>
</tr>
<tr>
<td>Vogt, Gina</td>
</tr>
<tr>
<td>Voller, Kelsey</td>
</tr>
<tr>
<td>Wade, Katherine</td>
</tr>
<tr>
<td>Wagner, Glenn</td>
</tr>
<tr>
<td>Walker, Caryn</td>
</tr>
<tr>
<td>Wallon, Robert</td>
</tr>
<tr>
<td>Walters, Verle</td>
</tr>
<tr>
<td>Wang, Edward</td>
</tr>
<tr>
<td>Ware, Teresa</td>
</tr>
<tr>
<td>Warren, Tanya</td>
</tr>
<tr>
<td>Watkins, Kathryn</td>
</tr>
<tr>
<td>Weaver, Jill</td>
</tr>
<tr>
<td>Webb, Denise</td>
</tr>
<tr>
<td>Weiss, Emily</td>
</tr>
<tr>
<td>Weissman, Elizabeth</td>
</tr>
<tr>
<td>Wendt, Stephanie</td>
</tr>
<tr>
<td>West, Andrew</td>
</tr>
<tr>
<td>West, April</td>
</tr>
<tr>
<td>Whaley, Mary</td>
</tr>
<tr>
<td>Wheeler, Deanna</td>
</tr>
<tr>
<td>Wheeler, Samuel</td>
</tr>
<tr>
<td>Whelan, Rosemary</td>
</tr>
<tr>
<td>White, Dan</td>
</tr>
<tr>
<td>Wiehagen, Michele</td>
</tr>
<tr>
<td>Wierman, Fraci</td>
</tr>
<tr>
<td>Wiig, Diana</td>
</tr>
<tr>
<td>Willard, Ted</td>
</tr>
<tr>
<td>Williams, Shirley</td>
</tr>
<tr>
<td>Willis, Amber</td>
</tr>
<tr>
<td>Winston, Amy</td>
</tr>
<tr>
<td>Wiseman, Skyler</td>
</tr>
<tr>
<td>Witecki, Maggy</td>
</tr>
<tr>
<td>Witt, Heather</td>
</tr>
<tr>
<td>Wohlrab, Lindsey</td>
</tr>
<tr>
<td>Wolfinger, Lisa</td>
</tr>
<tr>
<td>Wood, Laura</td>
</tr>
<tr>
<td>Wood, Steve</td>
</tr>
<tr>
<td>Woolbaugh, Walter</td>
</tr>
<tr>
<td>Workosky, Cindy</td>
</tr>
<tr>
<td>Wulber, April</td>
</tr>
<tr>
<td>Wunder, Marc</td>
</tr>
<tr>
<td>Yancey, Danielle</td>
</tr>
<tr>
<td>Yoshioka, Jon</td>
</tr>
<tr>
<td>Young, Donna</td>
</tr>
<tr>
<td>Young, Rosita</td>
</tr>
<tr>
<td>Zadina, Janet</td>
</tr>
<tr>
<td>Zeiger, David</td>
</tr>
</tbody>
</table>
### Advertisers

<table>
<thead>
<tr>
<th>Advertiser</th>
<th>Booth</th>
<th>Website/Contact Information</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEOPE CYBERMISSION and GEMS (Booth #1046), <a href="http://www.usaep.com">www.usaep.com</a>, 866-462-9237</td>
<td></td>
<td></td>
<td>95</td>
</tr>
<tr>
<td>American 3B Scientific (Booth #452), <a href="http://www.a3bs.com">www.a3bs.com</a>, 800-326-6335</td>
<td></td>
<td></td>
<td>29</td>
</tr>
<tr>
<td>ANATOMY IN CLAY® Learning System (Booth #926), <a href="http://www.anatomyinclay.com">www.anatomyinclay.com</a>, 800-950-5025</td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Camp Invention (Booth #1122), <a href="http://www.campinvention.org">www.campinvention.org</a>, 800-968-4332</td>
<td></td>
<td></td>
<td>89</td>
</tr>
<tr>
<td>Diversified Woodcrafts Inc. (Booth #808), <a href="http://www.diversifiedwoodcrafts.com">www.diversifiedwoodcrafts.com</a>, 877-348-9663</td>
<td></td>
<td></td>
<td>55</td>
</tr>
<tr>
<td>IRIS (Booth #1327), <a href="http://www.iris.edu/educate">www.iris.edu/educate</a></td>
<td></td>
<td></td>
<td>47</td>
</tr>
<tr>
<td>McGraw-Hill Education (Booth #1345), <a href="http://www.mheonline.com">www.mheonline.com</a>, 800-334-7344</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>The MiniOne™ Electrophoresis (Booth #816), <a href="http://www.theminione.com">www.theminione.com</a>, 800-255-1777</td>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>OHAUS Corp. (Booth #634), <a href="http://www.ohaus.com">www.ohaus.com</a>, 800-672-7722</td>
<td></td>
<td></td>
<td>Cover 4</td>
</tr>
<tr>
<td>PASCO scientific (Booth #622), <a href="http://www.pasco.com">www.pasco.com</a>, 800-772-8700</td>
<td></td>
<td></td>
<td>73</td>
</tr>
<tr>
<td>Smithsonian National Air and Space Museum, <a href="http://www.airandspace.si.edu/stemin80">www.airandspace.si.edu/stemin80</a></td>
<td></td>
<td></td>
<td>79</td>
</tr>
<tr>
<td>Society for Science &amp; the Public (Booth #1057), <a href="http://www.societyforscience.org">www.societyforscience.org</a></td>
<td></td>
<td></td>
<td>107</td>
</tr>
<tr>
<td>Stokes Publishing Co. (Booth #741), <a href="http://www.stokespublishing.com">www.stokespublishing.com</a>, 800-550-5254</td>
<td></td>
<td></td>
<td>75</td>
</tr>
<tr>
<td>Teachers’ Curriculum Institute (TCI) (Booth #256), <a href="http://www.teachtci.com">www.teachtci.com</a>, 800-497-6138</td>
<td></td>
<td></td>
<td>99</td>
</tr>
<tr>
<td>University of the Sciences in Philadelphia, <a href="http://www.usciences.edu">www.usciences.edu</a>, 888-996-8747</td>
<td></td>
<td></td>
<td>Cover 2</td>
</tr>
<tr>
<td>Vernier Software &amp; Technology (Booth #134), <a href="http://www.vernier.com">www.vernier.com</a>, 888-837-6437</td>
<td></td>
<td></td>
<td>Cover 3</td>
</tr>
<tr>
<td>VWR Science Education (Booth #142), <a href="http://www.wardsci.com/conference">www.wardsci.com/conference</a></td>
<td></td>
<td></td>
<td>21, 103</td>
</tr>
<tr>
<td>Western Michigan (Booth #1052), <a href="http://www.wmich.edu/online/nsta">www.wmich.edu/online/nsta</a></td>
<td></td>
<td></td>
<td>63</td>
</tr>
</tbody>
</table>

### NSTA Ads

<table>
<thead>
<tr>
<th>Ads</th>
<th>Booth</th>
<th>Website/Contact Information</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSTA Conferences (Booth #943, 2016 5th Annual STEM Forum), (Booth #935, Minneapolis), (Booth #937, Portland), (Booth #939, Columbus), (Booth #933, Los Angeles), <a href="http://www.nsta.org/conferences">www.nsta.org/conferences</a>, 800-722-6782</td>
<td></td>
<td></td>
<td>2, 11, 25, 37, 41, 85, 111</td>
</tr>
<tr>
<td>NSTA Member Services (Booth #934, NSTA Membership), <a href="http://www.nsta.org/membership">www.nsta.org/membership</a>, 800-722-6782</td>
<td></td>
<td></td>
<td>17, 51, 69</td>
</tr>
<tr>
<td>NSTA Press®, store.nsta.org, 800-277-5300</td>
<td></td>
<td></td>
<td>59</td>
</tr>
</tbody>
</table>
Introducing LabQuest Stream™

Mobile-Friendly Technology That Expands Possibilities

With LabQuest Stream, our wireless and USB sensor interface, students have the freedom and flexibility to simultaneously collect data from multiple Vernier sensors using a mobile device, a Chromebook™, or a computer. Just like the name suggests, students can stream data directly to a mobile device using Bluetooth® connectivity.

Multi-Platform Compatibility

- iPad®, iPhone®, iPod touch®
- Android® tablets and phones
- Windows and Mac
- Chromebooks

For more information, visit www.vernier.com/lq-stream
Ingeniously Practical

Leading the Way

Reliability, durability, precision, and flexibility have made the OHAUS Scout the number one portable balance for twenty years.

Scout leads the way with the most features and applications for education—one second stabilization time, specific gravity determination, Mole calculation, slim space-saving stackable design, and Bluetooth®, USB, Ethernet, or RS232 connectivity options.

• Quick and Efficient Navigation with the Informative Color Touchscreen Display
• Fast Weighing Speed and High Resolution Deliver Repeatable and Reliable Results
• Superior Overload Protection & Stackable Storage Drive Overall Durability

Visit Booth #634 to learn more about The Next Generation of Scout Balances