

FRIDAY, MARCH 16

**ATLANTA**

MARCH 15–18

**2018**

# Science on My Mind

## **NSTA NATIONAL CONFERENCE**

**VOL.2**

[www.nsta.org/atlanta](http://www.nsta.org/atlanta)

#NSTA18

**NSTA** National  
Science  
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**See schedule and daily giveaways** [MHEONLINE.COM/NSTA2018](http://MHEONLINE.COM/NSTA2018)

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## STORE HOURS

|                     |                 |
|---------------------|-----------------|
| Wednesday, March 14 | 4:00 PM–7:00 PM |
| Thursday, March 15  | 7:30 AM–5:00 PM |
| Friday, March 16    | 7:30 AM–5:00 PM |
| Saturday, March 17  | 7:30 AM–4:00 PM |
| Sunday, March 18    | 8:00 AM–NOON    |

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**NSTA 66th National Conference  
on Science Education**  
*Science on My Mind*  
Atlanta, Georgia • March 15–18, 2018

**Volume 2** Friday, March 16

|                                                                            |     |
|----------------------------------------------------------------------------|-----|
| Conference Highlights (Friday) . . . . .                                   | 5   |
| Conference Strands . . . . .                                               | 6   |
| Elementary Extravaganza . . . . .                                          | 6   |
| NGSS@NSTA Forum . . . . .                                                  | 10  |
| Community Connections Friday Events . . . . .                              | 10  |
| NSTA Press® Sessions . . . . .                                             | 12  |
| Meet Me in the Middle Day . . . . .                                        | 12  |
| Three Dimensions of the <i>Next Generation Science Standards</i> . . . . . | 13  |
| <i>Friday Daily Program</i> . . . . .                                      | 15  |
| Meetings and Social Functions (Friday) . . . . .                           | 115 |
| Index of Exhibitor Workshops (Friday) . . . . .                            | 116 |
| Schedule At A Glance (Friday) . . . . .                                    | 124 |
| Index of Participants (Friday) . . . . .                                   | 143 |
| Index of Advertisers . . . . .                                             | 152 |

**National Science Teachers Association**

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Inventor of Water Disinfecting Device, poses with a group of kids from Camp Invention.

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### 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.

### Friday, March 16

|                  |                                                                                                                   |     |
|------------------|-------------------------------------------------------------------------------------------------------------------|-----|
| 8:00–10:00 AM    | Elementary Extravaganza . . . . .                                                                                 | 20  |
| 8:00 AM–4:30 PM  | NGSS@NSTA Forum . . . . .                                                                                         | 10  |
| 9:00 AM–5:00 PM  | Exhibits . . . . .                                                                                                | 30  |
| 9:30–10:30 AM    | Robert H. Carleton Lecture: Edward Ortleb . . . . .                                                               | 33  |
| 9:30–11:00 AM    | Featured Presentation: Mike Kincaid and Scott Tingle . . . . .                                                    | 41  |
| 9:30–11:00 AM    | Global Initiatives Enhancing Science Education:<br>An International Share-a-Thon and Poster Session . . . . .     | 41  |
| 10:00 AM–12 Noon | Community Connections Featured Presentation and Panel:<br>Speaker: Fredi Lajvardi; Moderator: Ed Barker . . . . . | 48  |
| 9:45 AM–4:30 PM  | Meet Me in the Middle Day . . . . .                                                                               | 12  |
| 11:00 AM–12 Noon | Featured Presentation: Jo Anne Vasquez, <i>sponsored by Shell</i> . . . . .                                       | 52  |
| 12:30–2:30 PM    | Community Connections Share-a-Thon. . . . .                                                                       | 74  |
| 12:45–1:30 PM    | “Meet and Greet” the Presidents and Board/Council . . . . .                                                       | 75  |
| 2:00–3:00 PM     | Featured Presentation: Jeffrey Vinokur . . . . .                                                                  | 79  |
| 2:00–3:00 PM     | AGU-NSTA Sponsored Lecture: C. Mark Eakin . . . . .                                                               | 79  |
| 2:30–4:30 PM     | Meet Me in the Middle Share-a-Thon . . . . .                                                                      | 93  |
| 3:30–4:30 PM     | Featured Presentation: Okhee Lee, <i>sponsored by Shell</i> . . . . .                                             | 95  |
| 6:00–8:45 PM     | NSTA Teacher Awards Gala (M-1) . . . . .                                                                          | 113 |
| 6:00–9:00 PM     | HHMI Movie Night. . . . .                                                                                         | 113 |

## NSTA Teacher Awards Gala



Enjoy a fabulous evening celebrating with this year's teacher award recipients! ALL of the teacher awards will be presented in one grand evening. Join your colleagues in recognition of this year's winners.

**Friday, March 16, 6:00–8:45 PM**  
Grand Ballroom E, Omni Hotel at CNN Center

**Cost: \$80**

*By ticket only: #M-1*  
*Evening/Cocktail attire requested.*

**NSTA**  
National Science Teachers Association

The Atlanta 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.

### **Focusing On Evidence of 3-D Learning**

States continue to develop and adopt standards that build on a three-dimensional approach, which calls on students to use disciplinary core ideas, science and engineering practices, and crosscutting concepts to explain real-world phenomena and solve authentic problems. Three-dimensional learning allows students to connect science to their everyday lives and helps prepare them for future careers. This approach is fully realized only when instruction leads to tangible evidence of three-dimensional learning through authentic student products. This strand will help teachers, whether they are 3-D novices or experts, expand their understanding of three-dimensional teaching, learning, and assessment. Sessions in this strand will target participants with a beginning, intermediate, or advanced level of familiarity with three-dimensional learning.



### **Imagining Science as the Foundation for STEM**

STEM education has become a priority for many states as we seek to provide today's students with the real-world, innovative skills that they will need to be successful in tomorrow's world. STEM instruction that builds on the foundation of core science ideas provides students with opportunities that equip them to make sense of the world in which they live, hone their critical-thinking skills, and spark their sense of innovation. Sessions in this strand will allow participants to develop their understanding of how to plan and teach collaboratively within these integrated learning environments.



### **Reflecting On Access for All Students**

Just as science encompasses diverse fields of learning from astronomy to zoology, science educators are called upon to equitably meet the needs of and engage ALL learners. Research has identified the unique challenges of a number of underserved groups, including students from urban areas, rural areas, English language learners, students with low socioeconomic status, those with special needs, gifted and talented students, and students from diverse cultural backgrounds. Cultivating a culture of equity and inclusion for all students not only aligns with the NSTA mission statement and the vision put forth by *A Framework for K–12 Science Education* but also prepares students for future career opportunities in a global society. This strand increases participants' understanding of the unique needs of various types of learners and helps them reduce barriers to full participation in science.



### **Comprehending the Role of Literacy in Science**

A great number of personal and societal issues require citizens to draw upon a foundation of scientific knowledge, technological understanding of problem solving, and the ability to design scientific solutions to obtain, evaluate, and communicate information in order to make informed decisions. Engaging ALL students in science, beginning in the early years, is the way to develop students' skills in thinking creatively, expressing themselves, and investigating their world. As college- and career-ready students investigate natural phenomena, they should be able to communicate their argument-driven claims based on data-driven evidences. Science core ideas can be developed by using current technology and media to create, refine, and collaborate through reading, writing, listening, and speaking. This strand will allow educators to become advocates of literacy in preK–12 science and engineering, to see the connections between science and literacy, and to learn literacy strategies that encompass active student engagement.



Focusing On Evidence of 3-D Learning

**Friday, March 16**

**8:00–9:00 AM**

Three Dimensionality in Middle School Science Through the Use of a 6E Instructional Model

**8:00–11:00 AM**

Short Course: Designing and Using Three-Dimensional Assessments in Your Classroom (By Ticket: SC-5)

**9:30–10:30 AM**

Phenomenon? Bring It On!

**11:00 AM–12 Noon**

How to Transition to 3-D Standards-Based Grading

**12:30–1:30 PM**

Using Phenomena in the Physical Sciences

**2:00–3:00 PM**

Rethinking Assessment: Strategies for the NGSS Classroom

**3:00–6:00 PM**

Short Course: Putting the Pieces Together: Introduction and Implementation of 3-D Learning (By Ticket: SC-9)

**3:30–4:30 PM**

Phenomenal Mysteries and Probes in Science

# ELEMENTARY EXTRAVAGANZA

**Friday, March 16, 2018**

**8:00–10:00 AM • Exhibit Hall B-1  
GWCC**

- Hands-on activities
- Preview science trade books
- Learn about award and grant programs
- Walk away full of ideas and arms filled with materials
- Door prizes and refreshments
- 100+ presenters

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Organizations participating in the Elementary Extravaganza include the Association of Presidential Awardees in Science Teaching, the Council for Elementary Science International, the NSTA Committee on Preschool–Elementary Science Teaching, *Science & Children* authors and reviewers, and the Society of Elementary Presidential Awardees.



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## Imagining Science as the Foundation for STEM

### Friday, March 16

#### 8:00–9:00 AM

PlantingScience: Growing Students' Science Understanding Through Independent Investigations and Online Mentoring

#### 8:00–11:00 AM

Short Course: Citizen Science Projects That Transform Schoolyards into STEM Labs and Help K–12 Students Make Sense of Phenomena in Nature  
(By Ticket: SC-6)

#### 9:30–10:30 AM

National Marine Sanctuaries: Bringing Ocean Technology into Your Classroom

#### 10:00 AM–4:00 PM

Short Course: The World Ender: A STEAM PBL Unit  
(By Ticket: SC-7)

#### 11:00 AM–12 Noon

Featured Presentation: Science Is to STEM as Coffee Is to Starbucks: Real-World, Relevant, and Grounds for the Perfect Integration  
(Speaker: Jo Anne Vasquez)

Developing a Culturally Relevant Engineering Curriculum

#### 12:30–1:30 PM

The InVenture Challenge: Developing Future Innovators Through Invention and Entrepreneurship Experiences

#### 2:00–3:00 PM

Engaging Your STEM Ecosystem: A Fishy Success Story

#### 3:30–4:30 PM

Sliders, Blocks, Fences, and Mazes: Kindergarten Physics and Engineering

## Comprehending the Role of Literacy in Science

### Friday, March 16

#### 8:00–8:30 AM

Lab Reports and Expository Writing: Emphasizing the Nature of Science in Practice

#### 8:30–9:00 AM

Flowcharts and Technical Writing: Using Anatomy Diagrams

#### 9:30–10:30 AM

Surviving the Zombie Apocalypse

#### 11:00–11:30 AM

Reading and Using Data to Make Evidence-Based Claims

#### 11:30 AM–12 Noon

Law and Order in the High School Chemistry Classroom: Using a Mock Trial to Discuss Scientific Concepts and Ethics

#### 12:30–1:30 PM

Improving Science Practices Through Evaluating Scientific Journal Articles

#### 2:00–3:00 PM

Engineering Design Notebooks in the Classroom

#### 3:30–4:00 PM

Creating Opportunities to Capitalize on Literacy for Sense-Making in K–5 Science

#### 4:00–4:30 PM

I Want to Notebook, Too! How to Begin from Beginners

#### 5:00–6:00 PM

“The Sheep Are in the Jeep”: Forces and Motion

## Reflecting On Access for All Students

### Friday, March 16

#### 7:15–11:50 AM

Short Course: Science for Everyone: Engaging Diverse Learners Using SIOP Strategies, Visual Literacy, Scaffolding, and Culturally Relevant Pedagogy  
(By Ticket: SC-4)

#### 8:00–9:00 AM

Translating Research-Based Strategies into Science Enrichment

#### 11:00–11:30 AM

“See” Through the Cultural Differences Influencing Student Learning

#### 11:00 AM–12 Noon

Using STEM to Bring Parents and Projects into Title I Schools

#### 12:30–1:30 PM

Inclusive STEM Centers—It’s More Than Content: Lessons from My Second Graders

#### 2:00–3:00 PM

STEM Sprouts: STEM for Early Childhood

#### 3:30–4:30 PM

Featured Presentation: Engaging All Students in Science  
(Speaker: Okhee Lee)

#### 5:00–6:00 PM

Using Equitable Assessment Tasks to Engage All Students in 3-D Learning

P L E A S E   J O I N   U S   F O R   O U R

2018

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NGSS@NSTA Forum

Friday, March 16  
B102, Georgia World Congress Center



The NGSS@NSTA Forum explores resources you can use to implement three-dimensional instruction. Participate in one or more presentations. *See daily program for details.*

|                  |                                                                                                                                                    |               |                                                                                                                                      |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 8:00–9:00 AM     | Looking for NGSS-Focused Instructional Materials?                                                                                                  | 12:30–1:30 PM | Disruptions in Ecosystems: An NGSS-Designed Middle School Unit and PD Model                                                          |
| 9:30–10:30 AM    | What’s the Matter with Addie, and What Should We Do with CRISPR? Next Generation Storylines That Connect Science to Student Interests and Concerns | 2:00–3:00 PM  | <i>Interactions</i> : A Free 3-D Science Curriculum for Ninth-Grade Physical Science                                                 |
| 11:00 AM–12 Noon | A Model-Based Educational Resource for High School Biology                                                                                         | 3:30–4:30 PM  | How Can Light Help Me See and Communicate with Others? A Storyline Designed to Support 3-D Learning in an Early Elementary Classroom |

Community Connections  
Friday Events

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

|                  |                                                                                                                                                                                                                                                            |               |                                    |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------------------------|
| 10:00 AM–12 Noon | Featured Presentation and Panel: <i>Spare Parts</i> : Reinventing Engineering Education for the 21st Century<br>Speaker: Fredi Lajvardi<br>(Panel Moderator: Ed Barker)<br>Panelists: Woodie Flowers, Craig Forest, Lonnie G. Johnson, and Danielle Newman | 12:30–2:30 PM | Community Connections Share-a-Thon |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------------------------|

# See What's New

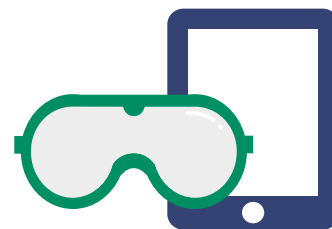
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NSTA Press Sessions

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.



Friday, March 16

8:00–9:00 AM

Big Data, Small Devices

9:30–10:30 AM

Building School and District Capacity for Eliciting, Supporting, and Understanding ALL Students’ Ideas in Science

11:00 AM–12 Noon

The Power of Assessing: Guiding Powerful Practices

12:30–1:30 PM

From Flower to Fruit

2:00–3:00 PM

Picture-Perfect STEM Lessons, K–5

3:30–4:30 PM

Everyday Engineering

5:00–6:00 PM

STEM Road Map: Integrated STEM Teaching in Middle School

Meet Me in the Middle Day

Friday, March 16, 9:45 AM–4:30 PM  
Rooms A311–314, A411/412b  
Georgia World Congress Center

Organized by the National Middle Level Science Teachers Association (NMLSTA) and sponsored by Activities to Teach; Carolina Biological Supply Co.; Educational Innovations; Google; Lab-Aids, Inc.; and Shape of Life.

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 a variety of incredible door prizes. Meet Me in the Middle sessions are described throughout this volume.

9:45–10:15 AM      Registration and Welcome  
10:15–10:45 AM      Concurrent Sessions  
11:00–11:30 AM      Concurrent Sessions

1:00–1:30 PM      Concurrent Sessions  
1:45–2:15 PM      Concurrent Sessions  
2:30–4:30 PM      Middle Level Share-a-Thon



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

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

## Disciplinary Core Ideas

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





In 1965, this century-old gristmill was moved to the Stone Mountain Park from its original site near Ellijay, Georgia. See page 65 in Vol. 1 for details about a Friday educational trip to Stone Mountain.



## 7:15–11:50 AM Short Course



### Science for Everyone: Engaging Diverse Learners Using SIOP Strategies, Visual Literacy, Scaffolding, and Culturally Relevant Pedagogy (SC-4)

(Grades 6–12) Tickets Required; \$43 Offsite; Clarkston High School Science Focus: LS, PS, CCC, SEP

**Jernita Randolph** ([jernita\\_m\\_randolph@dekalbschoolsga.org](mailto:jernita_m_randolph@dekalbschoolsga.org)) and **Ashley Mears** ([ashley\\_mears@dekalbschoolsga.org](mailto:ashley_mears@dekalbschoolsga.org)), Clarkston High School, Clarkston, GA  
For description, see Volume 1, page 59.

## 7:30–9:30 AM Networking Opportunity

### AMSE Alice J. Moses Annual Breakfast

(By Invitation Only) Pine (South Tower), Omni  
For details, please visit [www.amsekl6.org](http://www.amsekl6.org).

## 8:00–8:30 AM Presentations

### Using Project-Based Learning to Stop Ocean Plastic Pollution

(Grades 6–10) A404, GWCC  
Science Focus: ESS3.C, PS1, CCC2, CCC7, SEP1, SEP6, SEP7, SEP8

**Jessica Guccione** ([@msguccione](mailto:@msguccione); [jessguccione@gmail.com](mailto:jessguccione@gmail.com)), Venado Middle School, Irvine, CA

Let your students tackle the issue of plastic pollution through a Project-Based Learning unit that addresses topics, including synthetic materials, ecosystems, and human impact.



### Lab Reports and Expository Writing: Emphasizing the Nature of Science in Practice

(Grades 5–12) B212, GWCC  
Science Focus: GEN, SEP8

**Matthew Vick** ([mevick@wi.rr.com](mailto:mevick@wi.rr.com)) and **Nancy Stevens** ([stevensn@uww.edu](mailto:stevensn@uww.edu)), University of Wisconsin–Whitewater  
The expository writing of a lab report can serve as a gateway to understanding the empirical nature of science.

## Tower Garden Project

(Grades 5–College) C202, GWCC  
Science Focus: LS, CCC, SEP

**Josephine Jeganathan** ([jjeganathan@henry.k12.ga.us](mailto:jjeganathan@henry.k12.ga.us)) and **Carl Lashley** ([clashley@henry.k12.ga.us](mailto:clashley@henry.k12.ga.us)), Stockbridge High School, Stockbridge, GA

Tower garden (vertical garden) is a smart way to create cheap and healthy locally produced fresh food. A powerful tool for Project-Based Learning inside the classroom.

## 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 124, 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 13 for a complete list of the NGSS codes used in this program.

## Strands

The Atlanta 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.



### 3D Focusing On Evidence of 3-D Learning



### Imagining Science as the Foundation for STEM



### Comprehending the Role of Literacy in Science



### Reflecting On Access for All Students

The following icons will be used throughout this program.



### NSTA Press® Sessions



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



### NGSS@NSTA Forum Sessions

### **Citizen Mapping: Engaging Students in Placed-Based Science Using Geospatial Technologies**

(Grades 9–12) C212, GWCC

Science Focus: GEN, SEP1, SEP3, SEP8

**Kevin Czajkowski** ([kevin.czajkowski@utoledo.edu](mailto:kevin.czajkowski@utoledo.edu)), The University of Toledo, OH

Modules linking careers in STEM through geospatial technology will be presented promoting civic engagement around environmental issues in their community.

### **SCST-Sponsored Session: Hitting the Mark? Rigor, Reflection, and Results of Co-Teaching a STEM Standards-Based Competency Program**

(College) Hickory, Omni

Science Focus: GEN

**Kenneth Thompson** ([kthompso@emporia.edu](mailto:kthompso@emporia.edu)) and **Mirah Dow** ([dowmirah@yahoo.com](mailto:dowmirah@yahoo.com)), Emporia State University, Emporia, KS

Integrative competencies advocated by the National Science Foundation and co-taught to STEM teachers and librarians enrolled in the same courses are identified and evaluations shared.

### **NASA in Your Classroom!**

(Grades K–12) Walnut, Omni

Science Focus: GEN

**Meridith Mitchell** ([meridithmitchell@icimagine.org](mailto:meridithmitchell@icimagine.org)), **Katlyn Swanson** ([katlynschwanson@icimagine.org](mailto:katlynschwanson@icimagine.org)), and **Patricia Burgess** ([patriciaburgess@icimagine.org](mailto:patriciaburgess@icimagine.org)), Invest Collegiate Imagine, Asheville, NC

Come find out how NASA can be a part of your classroom and how you can become a part of NASA!



### **8:00–9:00 AM Presentations**

#### **Precipitating Change: Embedding Weather into the Middle School Science Classroom**

(Grades 6–9) A301, GWCC

Science Focus: ESS2.D, SEP2, SEP4, SEP5

**Carolyn Staudt** ([cjstaudt@concord.org](mailto:cjstaudt@concord.org)), Curriculum/Professional Developer, Concord, MA

**Nanette Marcum-Dietrich** ([ndietrich@millersville.edu](mailto:ndietrich@millersville.edu)), Millersville University of Pennsylvania, Millersville

**Nathan Kimball** ([nathan@albertiswindow.com](mailto:nathan@albertiswindow.com)) and **Chad Dorsey** ([cdorsey@concord.org](mailto:cdorsey@concord.org)), The Concord Consortium, Concord, MA

The universal interest in the weather, combined with the use of computational methods in meteorology, make weather forecasting promising in the integration of STEM learning.

#### **INF Let's Eradicate Mosquito-Borne Diseases! Join a Global Citizen Science Effort to Achieve This!**

(General) A303, GWCC

Science Focus: ESS2, ESS3, ETS2, LS2, INF, CCC2

**Cassie Soeffing** ([cassie\\_soeffing@strategies.org](mailto:cassie_soeffing@strategies.org)), Institute for Global Environmental Strategies, Arlington, VA

NASA launched a citizen science app to help identify and eradicate mosquitos. Learn how to use this app. Great hand-outs and NASA resources.

#### **Integrating E-Books into the Secondary Classroom**

(Grades 6–12) A304, GWCC

Science Focus: GEN

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

Engaging and innovative—learn how interactive multimedia elements and text from interactive e-books can enhance science learning in middle school and high school.

#### **Fake News! Helping Students Understand the Process of Science**

(General) A311, GWCC

Science Focus: ESS3

**Daniel Carroll** ([thedancarroll@hotmail.com](mailto:thedancarroll@hotmail.com)), Yorktown High School, Arlington, VA

Recently, 200,000 teachers received a book claiming scientists disagree about climate change. I was one of those teachers and was horrified by what I read. Come find out how to be a voice of reason in a world of confusing messages.



# Friday, March 16

|          | Featured Speakers/Special Events                                                                                                                                                                                   | Featured Speakers/Special Events                                                                                                                                                                                                                                                                                                                            | Featured Speakers/Special Sessions                                                                                                                                                                                                                                                     | Featured Speakers/Special Sessions                                                                                                                                                                              |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7:00 AM  |                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                 |
| 8:00 AM  |                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                             | <b>Elementary Extravaganza</b><br>8:00–10:00 AM<br>Exhibit Hall B-1, GWCC                                                                                                                                                                                                              | <b>NGSS@NSTA Forum</b><br>8:00 AM–4:30 PM<br>B102, Georgia World Congress Center                                                                                                                                |
| 9:00 AM  | <b>Robert H. Carleton Lecture</b><br>9:30–10:30 AM<br>A407, GWCC<br>Speaker: Edward Ortleb                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                             | <i>Sponsored by Carolina Biological Supply Co.,<br/>Insect Lore, Learning A–Z, Pitsco Education,<br/>School Specialty Science, and<br/>UBTECH Education</i>                                                                                                                            |                                                                                                                                                                                                                 |
| 10:00 AM |                                                                                                                                                                                                                    | <b>Community Connections<br/>Featured Presentation &amp; Panel</b><br><i>Spare Parts: Reinventing Engineering<br/>Education for the 21st Century</i><br>10:00 AM–12 Noon<br>B101, GWCC<br>Opening Presenter: Fredi Lajvardi<br>Moderator: Ed Barker<br>Panelists: Woodie Flowers, Craig Forest,<br>Lonnie G. Johnson, and Danielle Newman                   |                                                                                                                                                                                                                                                                                        | <b>Featured Presentation</b><br>NASA: Your STEM Connection<br>9:30–11:00 AM<br>B206, GWCC<br>Speakers: Mike Kincaid with<br>special downlink with Astronaut<br>Scott Tingle aboard the ISS,<br>courtesy of NASA |
| 11:00 AM | <b>Featured Presentation</b><br>11:00 AM–12 Noon<br>B309, Conv. Center<br>Speaker: Jo Anne Vasquez<br><i>sponsored by Shell</i>                                                                                    |                                                                                                                                                                                                                                                                                                                                                             | <b>Meet Me in the<br/>Middle Day</b><br>10:15 AM–4:30 PM<br>Rooms A311–314, A411/412b,<br>Georgia World Congress Center<br><br><i>Sponsored by Activities to Teach,<br/>Carolina Biological Supply Co.,<br/>Educational Innovations, Google,<br/>Lab-Aids, Inc., and Shape of Life</i> |                                                                                                                                                                                                                 |
| 12 Noon  |                                                                                                                                                                                                                    | <b>Community Connections<br/>Share-a-Thon</b><br>12:30–2:30 PM<br>B101, GWCC                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                        | <b>“Meet and Greet”<br/>the NSTA Presidents<br/>and Board/Council</b><br>12:45–1:30 PM<br>entrance to Hall B-2,<br>Georgia World Congress Center                                                                |
| 1:00 PM  |                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                 |
| 2:00 PM  | <b>AGU-NESTA Sponsored Lecture</b><br>2:00–3:00 PM<br>Sidney Marcus Auditorium GWCC<br>Speaker: C. Mark Eakin<br>Sponsored by American Geophysical<br>Union and the National Earth Science<br>Teachers Association |                                                                                                                                                                                                                                                                                                                                                             | <b>Featured Presentation</b><br><i>Premiere of Generation Genius</i><br>2:00–3:00 PM<br>B206, GWCC<br>Speaker: Jeffrey Vinokur                                                                                                                                                         | *One lucky person who attends<br>this event will be eligible to win<br>a \$100 gift certificate to the NSTA<br>Science Store. Must be present<br>to win. Drawing will take place<br>at 1:20 PM.                 |
| 3:00 PM  | <b>Featured Presentation</b><br>3:30–4:30 PM<br>B309, GWCC<br>Speaker: Okhee Lee<br><i>sponsored by Shell</i>                                                                                                      |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                 |
| 4:00 PM  |                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                 |
| 5:00 PM  |                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                 |
| 6:00 PM  | <b>NSTA Teacher Awards Gala</b><br>6:00–8:45 PM<br>Grand Ballroom E<br>Omni Hotel Atlanta at CNN Center<br>Ticket Required (M-I)                                                                                   | <b>HHMI Movie Night:</b><br><i>The Farthest—Voyager in Space</i><br>6:00–9:00 PM<br>Sidney Marcus Auditorium, GWCC<br>Separate registration<br><br>Dinner plus special screening<br>followed by inspiring panel featuring<br>members of the original <i>Voyager</i> team<br>Stop by the HHMI BioInteractive booth<br>(#323) for tickets to this free event. |                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                 |
| 7:00 PM  |                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                 |
| 8:00 PM  |                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                 |
| 9:00 PM  |                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                 |
| 10:00 PM |                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                 |



## Rethinking Science: Cultivating a Culture of Equity and Inclusion

(General)

A315, GWCC

Science Focus: GEN

**Bejanae Kareem** (@RethinkSchools; [bejanae.kareem@gmail.com](mailto:bejanae.kareem@gmail.com)), Member, NSTA Urban Education Advisory Board, Jonesboro, GA

**Jennifer Sauer** (@jauersdms; [chandanista@gmail.com](mailto:chandanista@gmail.com)), South Doyle Middle School, Knoxville, TN

Science is more than worksheets, textbooks, and memorization. We work with educators to rethink science to enhance learning and deepen understanding of culture, equity, and social justice.

## Using Models to Support STEM Learning in Grades 6–12: Examples and Insights from NSF’s DRK–12 Program

(Grades 6–12)

A402, GWCC

Science Focus: LS, PS, CCC4, SEP2, SEP5

**Daniel Damelin** (@dandamelin; [ddamelin@concord.org](mailto:ddamelin@concord.org)), The Concord Consortium, Concord, MA

**Susan Yoon** ([yoonsa@gse.upenn.edu](mailto:yoonsa@gse.upenn.edu)), University of Pennsylvania, Philadelphia

**Irene Lee** (@ProjectGUTS; [ireneannelee@gmail.com](mailto:ireneannelee@gmail.com)), Project GUTS, Cambridge, MA

Presider: Amy Busey ([abusey@edc.org](mailto:abusey@edc.org)), Education Development Center, Inc., New York, NY

Discussion centers on research-based examples of how secondary students can engage in modeling practice.

## INF Integrating Science and Math Through Citizen Science: MMSA’s WeatherBlur Program

(Grades 2–8)

A407, GWCC

Science Focus: ESS2.D, ESS3, INF, SEP1, SEP3, SEP4,

**Lisa Marchi** ([lmarchi@mmsa.org](mailto:lmarchi@mmsa.org)) and **Gary Lewis** ([glewis@mmsa.org](mailto:glewis@mmsa.org)), Maine Mathematics and Science Alliance, Augusta  
See how the WeatherBlur citizen science program enabled teachers to integrate science and math concepts and practices through local investigations co-developed with community experts.

## Freshwater Stewardship: Equip Your Student-Scientists with Cutting-Edge Resources from NOAA

(Grades 3–12)

A412a, GWCC

Science Focus: ESS

**Lindsay Knippenberg** (@ScienceWithMsK; [lindsayknippenberg@mgsd.k12.nc.us](mailto:lindsayknippenberg@mgsd.k12.nc.us)), Mooresville High School, Mooresville, NC

**Dennis Cain** ([dennis.cain@noaa.gov](mailto:dennis.cain@noaa.gov)), NOAA National Weather Service, Fort Worth, TX

Flooding. Water pollution. Freshwater is the lifeblood of our planet, and our future depends on the next generation of environmental stewards to preserve the health of watersheds. The National Oceanic and Atmospheric Administration (NOAA) has 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.



INF

## Translating Research-Based Strategies into Science Enrichment

(Grades 6–8)

B211, GWCC

Science Focus: INF, SEP1, SEP2, SEP3, SEP4, SEP6, SEP8

**Emma Banay** and **Lizzie Murchison** ([lmurchison@expandedschools.org](mailto:lmurchison@expandedschools.org)), Expanded Schools, New York City, NY

**Latoya Braswell** ([latoya.braswell@gmail.com](mailto:latoya.braswell@gmail.com)), Highland Park Community School, Brooklyn, NY

**Lidan Zhou** ([lzhou2@schools.nyc.gov](mailto:lzhou2@schools.nyc.gov)), New York City Dept of Education, Brooklyn, NY

Program staff and educators explain how they translated research-based strategies into an after-school science enrichment program that increases student engagement in STEM among high-needs urban youth.



## NSTA Press® Session: Big Data, Small Devices

(Grades 3–12)

B405, GWCC

Science Focus: ESS, LS2.B, LS2.C, CCC, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6

**Donna Governor** ([donna.governor@ung.edu](mailto:donna.governor@ung.edu)), University of North Georgia, Dahlonega

**Eric Brunsell** (@Brunsell; [brunsele@uwosh.edu](mailto:brunsele@uwosh.edu)), NSTA Director, Professional Development in Science Education, and University of Wisconsin Oshkosh

**G. Michael Bowen** ([gmbowen@yahoo.com](mailto:gmbowen@yahoo.com)), Mount Saint Vincent University, Halifax, NS, Canada

Find out how to use smartphone apps and real-time data to have students engage in three-dimensional scientific investigations and explore concepts in Earth and environmental science.



### Teaching Your Students About Managing a Fishery (Resource)

(Grades 9–12)

C204, GWCC

Science Focus: LS

**David Wehunt** ([wehunt@hotmail.com](mailto:wehunt@hotmail.com)), Soddy Daisy High School, Soddy Daisy, TN

Using a generic marine fishery, students representing six countries must maintain the fishery for 10 years. The activity can be modified by the teacher to be used for other desired outcomes.

### 3-D Learning Through NASA Orion Missions

(Grades 6–8)

C206, GWCC

Science Focus: ESS2.C, ESS2.D, ETS1.B, LS2.A, PS2.A, PS3.B, PS4.B, PS4.C, CCC5, SEP6

**Terra McMillan** ([@STEMTOTY](mailto:@STEMTOTY); [tmc305@gmail.com](mailto:tmc305@gmail.com)),

**Travis Phelps** ([@STEMTOTY](mailto:@STEMTOTY); [travis.phelps@hcbe.net](mailto:travis.phelps@hcbe.net)), and

**Leshan Ferguson** ([@STEM&Me](mailto:@STEM&Me); [leshan.ferguson@hcbe.net](mailto:leshan.ferguson@hcbe.net)),

Thomson Middle School, Centerville, GA

NASA Orion missions provides a great platform for engineering design challenges that incorporates disciplinary core ideas and crosscutting concepts to land humans on Mars.

### Now We Have Our Curriculum, What's Next? NGSS Dissemination

(Grades 6–12)

C213, GWCC

Science Focus: GEN, NGSS

**Ana Houseal** ([ahouseal@uwyo.edu](mailto:ahouseal@uwyo.edu)) and **Martha Inouye** ([mcinouye@gmail.com](mailto:mcinouye@gmail.com)), University of Wyoming, Laramie

Explore protocols and instructional strategies used to integrate teacher practice to three-dimensional learning and NGSS vision-based curricula (secondary science focus). Handouts and resources!

### Advantages or Disadvantages to Using Polymers in Our Environment

(Grades 8–11)

C301, GWCC

Science Focus: GEN, SEP 4, 7, 8

**Robert Wesolowski** ([robertwes2@gmail.com](mailto:robertwes2@gmail.com)), Saint Joseph High School, Natrona Heights, PA

Hear about the advantages and disadvantages of using polymers. Engineers must investigate the effect of using polymers in their projects on the environment.

### The Next Generation of Phenomena-Based Performance Tasks

(Grades 6–12)

Dogwood B, Omni

Science Focus: GEN, NGSS

**Melissa DeLaurentis** ([mdelaurentis@lcps.net](mailto:mdelaurentis@lcps.net)) and **Stephanie Hofacket** ([@SHofacket](mailto:@SHofacket); [shofacket@lcps.net](mailto:shofacket@lcps.net)), Las Cruces (NM) Public Schools

Shift teaching and instructional sequences to design coherent instruction where students investigate compelling natural phenomena through three-dimensional performance tasks. Investigate the structure and implementation of phenomena-based science performance tasks to assess evidence of three-dimensional learning for all students.

### CSSS-Sponsored Session: Supporting Language and Literacy Through 3-D Science Instruction in Early Grades

(Grades K–5)

Grand Ballroom C, Omni

Science Focus: GEN, NGSS

**Amber McCulloch** ([amber.mcculloch@k12.wa.us](mailto:amber.mcculloch@k12.wa.us)), Washing

ton Office of Superintendent of Public Instruction, Olympia

**Carla Zembal-Saul** ([czemsaul@gmail.com](mailto:czemsaul@gmail.com)), Penn State, University Park, PA

The CSSS Elementary Committee will share practices, resources, and tools for supporting elementary teachers/administrators in enhancing language and literacy development through three-dimensional science teaching.

### Toward Inclusion of All Learners Through Science Teacher Education

(General)

International Ballroom C, Omni

Science Focus: GEN, SEP

**Sami Kahn** ([@samiscience](mailto:@samiscience); [kahns@ohio.edu](mailto:kahns@ohio.edu)), Ohio University, Athens

**Michele Hollingsworth Koomen** ([mkoomen@gac.edu](mailto:mkoomen@gac.edu)), Gustavus Adolphus College, Saint Peter, MN

**Judith Lederman** ([ledermanj@iit.edu](mailto:ledermanj@iit.edu)), Illinois Institute of Technology, Chicago

**Selina Bartels** ([selina.bartels@cuchicago.edu](mailto:selina.bartels@cuchicago.edu)), Concordia University Chicago, River Forest, IL

**Kevin Fleming** ([kevin.james.fleming@gmail.com](mailto:kevin.james.fleming@gmail.com)) and **Dina Secchiaroli** ([@DinaSecchiaroli](mailto:@DinaSecchiaroli)), Area Cooperative Educational Services (ACES), Hamden, CT

**Lacey Huffling** ([lhuffling@georgiasouthern.edu](mailto:lhuffling@georgiasouthern.edu)), Georgia Southern University, Statesboro

**Jonté Taylor** ([@docjttaylor](mailto:@docjttaylor); [jct215@psu.edu](mailto:jct215@psu.edu)), Penn State, University Park, PA

**Lyla Mae Crawford** ([lylac@uw.edu](mailto:lylac@uw.edu)), DO-IT, University of Washington, Spokane

During this interactive panel presentation, researchers will

share findings of critical importance to all science educators interested in ensuring equitable and excellent science for all.

### Using Phenomena to Initiate Student Science Performances

(Grades K–12) *International Ballroom F, Omni*

Science Focus: PS2.A, CCC, SEP

**Kenneth Huff** ([huffkennethlee@gmail.com](mailto:huffkennethlee@gmail.com)), NSTA Director, Middle Level Science Teaching, and Mill Middle School, Williamsville, NY

**Brett Moulding** ([mouldingb@ogdensd.org](mailto:mouldingb@ogdensd.org)), Partnership for Effective Science Teaching and Learning, Ogden, UT

**Wil Van der Veen** ([@rvccngss](mailto:@rvccngss); [wil.vanderveen@raritanval.edu](mailto:wil.vanderveen@raritanval.edu)), Raritan Valley Community College, North Branch, NJ  
Find out how you can engage students in a science performance by modeling instruction consistent with the NRC Framework and NGSS.

### You Can Model That: How to Engage All Students in Authentic Science Modeling

(Grades K–12) *Juniper, Omni*

Science Focus: GEN, SEP2

**Stephanie Harmon** ([@StephHarmon41](mailto:@StephHarmon41); [sharmon8564@earthlink.net](mailto:sharmon8564@earthlink.net)), Rockcastle County High School, Mount Vernon, KY

**Diane Johnson** ([@MDHJohnson](mailto:@MDHJohnson); [jdiane72@gmail.com](mailto:jdiane72@gmail.com)) and **Kimberly Zeidler-Watters** ([@KimWatters5](mailto:@KimWatters5); [kim.zeidler@eku.edu](mailto:kim.zeidler@eku.edu)), ECU Partnership Institute for Math and Science Education Reform, Lexington, KY

Learn specific classroom-tested strategies for building students' proficiency in the five main types of scientific modeling at any grade, from primary through high school.

### NSELA-Sponsored Session: Teaching a Culturally Responsive Pedagogy

(General) *Magnolia, Omni*

Science Focus: GEN

**Bruce Jones**, Mesa (AZ) Public Schools

Members of the National Science Education Leadership Association Diversity Committee invites you to spend time with us as we explore what it really means to be culturally responsive to your students. It just might surprise you! We have a PowerPoint that can be shared at your school to help educate your team or staff.

### Reading, Writing, and Speaking Science

(Grades 2–12) *Maple A/B, South Tower, Omni*

Science Focus: GEN, SEP1, SEP2, SEP4, SEP5, SEP6, SEP7, SEP8

**Erika Stewart**, Clinton Middle School, Clinton, WI

Discover how to integrate ELA and the CCSS into your science classroom. Learn about science literacy, experience a collaborative conversation, and bring home samples to try in your classroom.

### NARST-Sponsored Session: Using Agriculture as a Context for Teaching Genetics in Elementary Classrooms: Insights from UnICORN

(Grade 3) *Maple C, South Tower, Omni*

Science Focus: LS3, SEP2

**Erin Ingram** ([eingram3@unl.edu](mailto:eingram3@unl.edu)), **Cory Forbes** ([@corytforbes](mailto:@corytforbes); [cforbes3@unl.edu](mailto:cforbes3@unl.edu)), and **Dante Cisterna** ([dicister@gmail.com](mailto:dicister@gmail.com)), University of Nebraska–Lincoln

We will share insights from the development, implementation, and assessment of UnICORN (Understanding Inheritance in Corn) in nine grade 3 classrooms across two states. Join us to engage in an exemplar lesson from the curriculum and receive information about students' conceptualization about traits, inheritance, and variation.



### 8:00–9:00 AM Hands-On Workshops

#### STEM from the Stratosphere: Activities in the Infrared

(Grades 6–College)

A302, GWCC

Science Focus: ESS, SEP1, SEP3

**Susan Oltman** (@sueatsea; [soltman@mountvernonschool.org](mailto:soltman@mountvernonschool.org)), Mount Vernon Presbyterian School, Atlanta, GA

**Lisa Wininger** (@LisaWininger; [lisa.a.wininger@nasa.gov](mailto:lisa.a.wininger@nasa.gov)), Einstein Fellow, NASA Headquarters, Washington, DC

**Daniel Molik** ([dmolik@tpaa.org](mailto:dmolik@tpaa.org)), The Palmdale Aerospace Academy, Palmdale, CA

**Robert Swanson** ([storminswanson@juno.com](mailto:storminswanson@juno.com)), Itawamba Community College, Tupello, MS

**April Whitt** (@fernbankscience; [april\\_whitt@dekalbschool-sga.org](mailto:april_whitt@dekalbschool-sga.org)), Fernbank Science Center, Atlanta, GA

**Megan Tucker** ([megan.tucker@hillsborocharter.org](mailto:megan.tucker@hillsborocharter.org)), Hillsboro Charter Academy, Purcellville, VA

Join six NASA SOFIA Science Ambassadors as they share specifics about flying with NASA and infrared astronomy. They will also present hands-on infrared activities to use in the classroom.

#### *The Little Things That Run the World: Soil Ecology in the Classroom*

(Grades 5–12)

A305, GWCC

Science Focus: LS, CCC, SEP

**David Brock** ([brockda@rpcs.org](mailto:brockda@rpcs.org)), Roland Park Country School, Baltimore, MD

Presider: Pamela Bryer ([pbryer@bowdoin.edu](mailto:pbryer@bowdoin.edu)), Bowdoin College, Brunswick, ME

Learn about a nationally recognized ecology project, *The Little Things That Run the World*, and discover ways to engage your students in hands-on field studies.

#### Using Real Data in the Classroom

(Grades 6–9)

A312, GWCC

Science Focus: GEN, CCC1, SEP4, SEP8

**Joanna Chierici** (@ChiericiJoanna; [jchierici@ewrsd.k12.nj.us](mailto:jchierici@ewrsd.k12.nj.us)), Melvin H. Kreps Middle School, Hightstown, NJ

**Brianna Reilly** (@MsB\_Reilly; [breilly39@gmail.com](mailto:breilly39@gmail.com)), Hightstown High School, Hightstown, NJ

Go beyond the classroom and explore real scientific data through graphing and analysis, discussion, and art.

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**Booth 1203**

across from Disney Youth Programs



### Using Models to Move Past the Scientific Processes of Test and Measurement and into the Engineering Stage of Development

(Grades 6–8)

A313, GWCC

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

**William Sumrall** ([sumrall@olemiss.edu](mailto:sumrall@olemiss.edu)), The University of Mississippi, University, MS**Kelle Sumrall** ([kellesumrall@gmail.com](mailto:kellesumrall@gmail.com)), Lafayette Middle School, Oxford, MS

Learn how to integrate STEM/NGSS through the Understanding by Design (UBD) process. Join us to build models, prototypes, and apparatus that safely drop medicine into the Amazon rain forest.

### Using Performance Expectations to Plan for Classroom Assessments

(Grades 6–12)

A314, GWCC

Science Focus: GEN, NGSS

**Dora Kastel** ([kastel.dora@gmail.com](mailto:kastel.dora@gmail.com)), New Visions for Public Schools, New York, NY**Cindy Gay** (@CindyGay; [cindyjgay@gmail.com](mailto:cindyjgay@gmail.com)), BSCS, Colorado Springs, CO

Use a tool to engage in a process that deepens understanding of NGSS performance expectations to consider evidence of learning and plan for classroom assessment.

### Dare to Think: Philosophical Dialogue in the Science Class

(Grades 3–9)

A316, GWCC

Science Focus: GEN

**Jelle De Schrijver** (@Jelledeschrijver; [jelle.deschrijver@odisee.be](mailto:jelle.deschrijver@odisee.be)), University College Odisee, Brussel, Belgium

“Can a rabbit be a scientist?” or “Is an apple alive?” Philosophical dialogues about science help students reflect, develop arguments, and explore new perspectives.

### How to Support Biology Students in Constructing Explanations About Carbon-Transforming Processes

(Grades 6–12)

A410, GWCC

Science Focus: LS, CCC5, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7

**Elizabeth De Los Santos** (@edls2012; [elizabeth.xeng.delos-santos@gmail.com](mailto:elizabeth.xeng.delos-santos@gmail.com)), University of Nevada, Reno**Colleen Chapoton** ([cchapoton@kamsc.k12.mi.us](mailto:cchapoton@kamsc.k12.mi.us)), Kalamazoo Area Mathematics & Science Center, Kalamazoo, MI

We will share how to use the Carbon TIME curriculum to support students in using crosscutting concepts to construct explanations about carbon-transforming processes such as photosynthesis.



### NGSS@NSTA Forum Session: Looking for NGSS-Focused Instructional Materials?

(Grades K–12)

B102, GWCC

Science Focus: GEN, NGSS

**Matt Krehbiel** (@ksscienccegy; [mkrehbiel@achieve.org](mailto:mkrehbiel@achieve.org)), Achieve, Inc., Washington, DCPresident: Ted Willard ([twillard@nsta.org](mailto:twillard@nsta.org)), Assistant Executive Director, Science Standards, NSTA, Arlington, VA

What’s really different about lessons, units, and full-year materials designed for the NGSS? Alignment claims, NGSS colors, and stickers are everywhere and it’s often difficult to interpret what they mean. If you’re attending any sessions on NGSS-focused lessons, units, or textbooks, or planning to spend time looking for materials in the exhibit hall, you need to come to this session first. Be a savvy consumer—ask the right questions, get the evidence you need, make smart decisions, and learn how to best support student learning.

### NESTA and Climate.gov: Decoding Global Temperature and Carbon Dioxide Levels from a Model Ice Core

(Grades 6–12)

B103, GWCC

Science Focus: ESS1.C, ESS2.C, ESS2.D, ESS3.D, CCC1, CCC2, CCC4, SEP2, SEP4

**LuAnn Dahlman** ([luann.dahlman@noaa.gov](mailto:luann.dahlman@noaa.gov)), NOAA Climate Program Office, Silver Spring, MD**Carla McAuliffe** ([carla\\_mcauliffe@terc.edu](mailto:carla_mcauliffe@terc.edu)), TERC, Cambridge, MA

This modeling investigation dispels the misconception that historical global temperatures are inferred from carbon dioxide levels in trapped air bubbles rather than from isotopes of oxygen in ice layers.

### 3D Three Dimensionality in Middle School Science Through the Use of a 6E Instructional Model

(Grades 4–9)

B401, GWCC

Science Focus: GEN, NGSS

**Lisa Martin-Hansen** (@LMartinHansen; [l.martinhansen@csulb.edu](mailto:l.martinhansen@csulb.edu)), California State University, Long Beach**Geeta Verma** (@gverma116; [geeta.verma@ucdenver.edu](mailto:geeta.verma@ucdenver.edu)), University of Colorado Denver

Come to this session to view and experience a portion of an NGSS-focused lesson sequence in middle school ecology that builds on the 5E (engage, explore, explain, elaborate, extend) model by considering a 6th E...engineering.





## PlantingScience: Growing Students' Science Understanding Through Independent Investigations and Online Mentoring

(Grades 6–12)

B402, GWCC

Science Focus: GEN, SEP

**Catrina Adams** ([cadams@botany.org](mailto:cadams@botany.org)), The Botanical Society of America, Saint Louis, MO

**Anne Westbrook** ([awestbrook@bscs.org](mailto:awestbrook@bscs.org)), BSCS, Colorado Springs, CO

PlantingScience is a free online resource available to teachers and schools. Take part in activities showing how students' understanding of science grows while using increasingly independent investigations supported by online mentoring by research scientists.

## Stimulate Student Learning with Food!

(Grades 7–12)

C201, GWCC

Science Focus: GEN, NGSS

**Laurie Hayes** ([lhayes@cart.org](mailto:lhayes@cart.org)), The Center for Advanced Research and Technology, Clovis, CA

**Susan Hartley** ([susan.mumford.hartley@hotmail.com](mailto:susan.mumford.hartley@hotmail.com)), Hinkley High School, Aurora, CO

We will serve up a menu of options to teach nutrition and food science. Engage in hands-on activities using food to teach NGSS and integrate CCSS. Handouts and door prizes.

## Inherit New Skills: Evolution for Middle School Educators

(Grades 6–8)

C203, GWCC

Science Focus: GEN

**Kathryn Green** ([kegreen4@ncsu.edu](mailto:kegreen4@ncsu.edu)), North Carolina State University, Raleigh

The Teacher Institute for Evolutionary Science is a teacher-run project that provides evolution content and free ready-to-use resources for the classroom.

## Move, Think, Achieve: Promoting Student Engagement Through Activity, Collaboration, and Problem Solving

(Grades 4–8)

C205, GWCC

Science Focus: GEN

**Jennifer Joiner** ([joiner.jennifer@mail.fcboe.org](mailto:joiner.jennifer@mail.fcboe.org)), Whitewater Middle School, Fayetteville, GA

Take part in a student-led activity that incorporates kinesthetic-style practices and problem-solving skills. Experience how all students can achieve success through collaboration, active learning, and critical thinking.

## Analytical Thinking: Putting Your MAD Math Skill to Work in Science

(Grades 6–8)

C209, GWCC

Science Focus: PS2.A, PS3.B, CCC3, SEP3, SEP4, SEP7

**Susan German** ([@susan\\_german](mailto:@susan_german); [susangermanscience-teacher@gmail.com](mailto:susangermanscience-teacher@gmail.com)), Hallsville Middle School, Hallsville, MO

To help students analyze data in meaningful ways, we teach Mean Absolute Deviation. Along with learning how to calculate, students apply using it to situations in science and engineering.

## A Journal of Student Research: Giving Purpose to Writing in Science

(Grades 6–9)

C211, GWCC

Science Focus: LS2.A, LS2.B, LS2.C, CCC1, CCC2, CCC4, CCC5, CCC7, SEP1, SEP3, SEP4, SEP7, SEP8

**Rebecca Harvey** ([@VitalSignsME](mailto:@VitalSignsME); [mharvey@gmri.org](mailto:mharvey@gmri.org))

and **Christine Voyer** ([christine@gmri.org](mailto:christine@gmri.org)), Gulf of Maine Research Institute, Portland

Experience strategies that prepare students to share work as part of a journal of student scientific research. Dig into lessons that develop skills in conducting investigations, constructing arguments from evidence, and science writing.

## NGSS: Preparing Students for STEM Careers

(Grades K–12)

Cottonwood A/B, Omni

Science Focus: ETS1

**Denise Clarke-Mayers** ([dagcmayers@gmail.com](mailto:dagcmayers@gmail.com)), East Orange STEM Academy, East Orange, NJ

The 5E (Engage, Explore, Explain, Elaborate, and Evaluate) instructional model provides the framework for the translation of the NGSS and the engineering design process to classroom instruction.

## Global Collaboration in Engineering: Examples of RC Cars and Drones

(Grades 7–12)

Dogwood A, Omni

Science Focus: ETS, CCC2, CCC4, CCC5, CCC6, SEP

**Yujiro Fujiwara** ([yfujiwara@caj.or.jp](mailto:yfujiwara@caj.or.jp)), Christian Academy in Japan, Tokyo

**Lee Jones** ([leejones15@gmail.com](mailto:leejones15@gmail.com)), Asia Pacific International School, Seoul, Republic of Korea

We will share a practical approach to designing global activities/lessons related to using 3D printers to build RC car and drone technology for students in grades 7–12, compliant with NGSS.

### Collaborating with Scientists to Create Authentic STEM Challenges

(Grades K–12)

Grand Ballroom A, Omni

Science Focus: GEN

**Janet Clarke** ([jclarke@sitkascience.org](mailto:jclarke@sitkascience.org)), Sitka Sound Science Center, Sitka, AK

Experience innovative activities developed across multiple grade levels by collaborative efforts between scientists and educators in Sitka, Alaska.

### Full STEAM Ahead...Engineering Activities to Engage All Students

(Grades 4–12)

International Ballroom D, Omni

Science Focus: ETS, SEP

**Lauren Rentfro** ([rentfrla@lewisu.edu](mailto:rentfrla@lewisu.edu)), Lewis University, Romeoville, IL

Leave with dozens of ideas and a template for designing engineering activities to address student skills in the STEAM fields and low-cost/low-prep engineering activities for grades K–12.

### ASTE-Sponsored Session: CONnected!

(Grades 6–12)

Spruce, South Tower, Omni

Science Focus: GEN, INF

**Amanda Glaze** ([@EvoPHD](mailto:@EvoPHD); [aglazeua@gmail.com](mailto:aglazeua@gmail.com)), Georgia Southern University, Statesboro

Join me for a LARP or two as we explore the power of manga, comics, art, and other popular culture mediums in building science literacy.

# CALLING ALL MIDDLE SCHOOL EDUCATORS

Friday, March 16, 2018 | 10:15 AM–4:30 PM  
Rooms A311–314, A411/412b, GWCC

**\*MUST BE REGISTERED FOR THE CONFERENCE TO ATTEND\***

Join us for a special “Meet Me in the Middle Day,” designed just for middle school educators, at **NSTA’s 2018 National Conference in Atlanta!**

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

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

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[www.nsta.org/Atlanta](http://www.nsta.org/Atlanta)

### 8:00–9:00 AM Exhibitor Workshops

#### littleBits in Grades 3–8 STEM Classrooms

(Grades 3–8)

B216, GWCC

Science Focus: ETS

Sponsor: Pearson Learning Services

**Michael Comer**, Pearson, Boston, MA

Makerspaces are everywhere! From classrooms to your public library, these new learning spaces are being turned into centers of innovation. Come see how using littleBits, the award-winning electronic modules, can infuse STEM learning into your classroom experience. Participants will explore the littleBits components as they create a solution to a design challenge.

### INF STEMrangers: Making Science Night Meaningful

(Grades 3–8)

B301, GWCC

Science Focus: GEN, INF, SEP1

Sponsor: STEMscopes

**Suzan Morris** ([smorris@acceleratelearning.com](mailto:smorris@acceleratelearning.com)), STEMscopes, Houston, TX

STEMscopes has partnered with EarthEcho International to develop Science Nights for schools that turn learning into action. Come see how you can both learn new science content and help save Earth's most valuable resource. Leave with the tools to make your campus science night an unforgettable event for students and families.

### Hands-On: Model Watersheds and Human Impacts

(Grades 6–8)

B315, GWCC

Science Focus: ESS3.A, ESS3.C, CCC2, CCC4, SEP2, SEP4

Sponsor: PASCO scientific

**Fran Zakutansky**, PASCO scientific, Roseville, CA

How can students understand the impact of human activity on natural systems? Help students understand this by creating a model watershed system. With the Wireless pH Sensor, you will monitor the effect of human activity on water as a "pollutant" is added to the system.

### Made Easy: How to Untangle Electric Circuits

(Grades 7–12)

B316, GWCC

Science Focus: ETS, PS, CCC1, CCC2, CCC4, CCC5, CCC6, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8

Sponsor: PASCO scientific

**Brett Sackett**, PASCO scientific, Roseville, CA

Join us to experience the best way to teach basic circuits! Remove the tangled wires that confuse student learning and focus on the science. Give your students the freedom to explore their own circuit designs while making the teaching of circuits easier than ever!

### 8:00–9:30 AM Exhibitor Workshops

#### Planning and Designing Investigations Using Balanced and Unbalanced Forces

(Grades K–5)

B201, GWCC

Science Focus: PS2

Sponsor: Carolina Biological Supply Co.

#### Carolina Teaching Partner

NGSS recommends a departure from traditional step-by-step confirmation labs, moving instead to students planning and designing investigations. How can I demonstrate balanced and unbalanced forces? What is the relationship between inertia, force, and mass? Engage with colleagues in answering these questions using the lessons from *Building Blocks of Science 3-D*.

#### Comparative Mammalian Organ Dissection with Carolina's Perfect Solution® Specimens

(Grades 6–12)

B202, GWCC

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

#### Carolina Teaching Partner

Come show us your surgical skills while you experience the superior quality of Carolina's Perfect Solution specimens! Participants dissect a sheep brain, cow eye, pig heart, or pig kidney and observe internal and external structures. Use this excellent comparative dissection to gain a better understanding of these mammalian organs.

#### Fantastic Physical Science Demonstrations from Flinn Scientific

(Grades 5–College)

B203, GWCC

Science Focus: PS

Sponsor: Flinn Scientific, Inc.

**Janet Hoekenga** ([jhoekenga@flinnsci.com](mailto:jhoekenga@flinnsci.com)), and **Megan Leifker** ([mleifker@flinnsci.com](mailto:mleifker@flinnsci.com)), Flinn Scientific, Inc., Batavia, IL

Engage your students with quick demonstrations that teach common physical science topics, including force and motion, waves, light and color, energy, pressure, and scientific inquiry. Great demos to stimulate student interest, arouse curiosity, increase observational skills, and reinforce the learning process in a fun and positive way! A dozen effective demonstrations will be performed. Handouts for all activities. Visit [www.flinnsci.com](http://www.flinnsci.com) for more information.

### **Arriving on the Scene: Collect and Analyze Evidence Like the Pros**

(Grades 9–12)

B204, GWCC

Science Focus: GEN, NGSS

Sponsor: Carolina Biological Supply Co.

#### **Carolina Teaching Partner**

Thinking about incorporating forensic science into your classroom? Expose your students to the fascinating world of forensics by using real-world techniques practiced by law enforcement agencies. Keep your students captivated by analyzing and documenting evidence to recreate a crime scene.

### **Water Quality with Vernier**

(Grades 7–College)

B207, GWCC

Science Focus: ESS3, ETS2, LS2

Sponsor: Vernier Software & Technology

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

In this engaging hands-on workshop, practice best techniques for using Vernier sensors and LabQuest 2, with built-in GPS, to study water quality in the field. Also learn how to calibrate sensors, such as the pH Sensor. See how to map data on Google Maps and ArcGIS using Logger *Pro* software.

### **Advanced Physics with Vernier**

(Grades 9–College)

B208, GWCC

Science Focus: ETS2, PS2, PS3, PS4

Sponsor: Vernier Software & Technology

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

Already experienced using basic physics sensors and Logger *Pro* software from Vernier? This hands-on workshop will introduce additional Vernier sensors and lab equipment that will enhance your AP, IB, or college physics laboratory in mechanics and beyond. Plus, you will learn to employ advanced data-analysis techniques to explore quantitative relationships.

### **Science and Engineering Practices in the NGSS**

(Grades K–5)

B209, GWCC

Science Focus: GEN, NGSS

Sponsor: TCI

**Christy Sanders**, TCI, Mountain View, CA

Join TCI and participate in an engaging Bring Science Alive! investigation that will have your elementary students developing solutions and making sense of the natural and designed world. Participants will experience this lesson from the students' perspective as they carry out investigations, build

models, analyze and interpret data, develop solutions, and communicate their methods just like professional scientists and engineers!

### **Get Hands-On with STEM**

(Grades P–5)

B213, GWCC

Science Focus: ESS, ETS, LS

Sponsor: ETA hand2mind

**Mary Susnis** and **Karen Achtemeier**, ETA hand2mind, Vernon Hills, IL

Do your preK–5 students struggle with real-world problem solving? Do you have a hard time fitting science and STEM into your day? In this fast-paced session, you will get elbow deep in engineering challenges for grades preK–5. Experience activities from Earth, life, and physical science. Leave with goodies to use now!

### **Rock the NGSS with Electric Guitars!**

(Grades 6–College)

B214, GWCC

Science Focus: GEN, NGSS

Sponsor: STEMMy Stuff

**Ryan Peterson** and **Steve Meyer**, STEMMy Stuff, Brillion, WI

Do you need an irresistible hook to grab kids and engage them in learning a TON of STEM content for not a lot of money? Have each of your students build an electric guitar! We will discuss materials, tools, content, and curriculum.

### **Toward High School Biology: Introducing a New Middle School Curriculum Unit**

(Grades 6–8)

B215, GWCC

Science Focus: LS1.C, PS1.A, PS1.B, CCC, SEP

Sponsor: AAAS Project 2061

**Leah Donovan**, Oakland Mills Middle School, Columbia, MD

**Jo Ellen Roseman**, AAAS/Project 2061, Washington, DC  
**Sarah Quick Pappalardo**, Dunloggin Middle School, Ellicott City, MD

Join us for an overview of Toward High School Biology, a new middle school unit that meets the NGSS and is published by NSTA Press®. Participants will engage in sample activities to see how the unit promotes student learning and supports teachers in its use.



### Different Isn't Bad: Using Arthropods to Teach About Science, Society, and Being a Teen

(Grades 6–8)

B217, GWCC

Science Focus: LS

Sponsor: Celestron

**Kristie Reddick**, The Bug Chicks, College Station, TX  
Using digital microscopes and arthropods, entomologist and educator Kristie Reddick of The Bug Chicks teaches about the structure and function of “bug” body parts. Classify, compare, and distinguish between morphological features and learn how to approach social topics like bullying, racism, and self-acceptance using arthropods as a model system. Turn “ewwww” to “cool” using tips and tricks from this grades 6–8 level class.

### Inquiry in the Chemistry Classroom: A Game-Based Approach

(Grades 9–12)

B218, GWCC

Science Focus: PS

Sponsor: PlayMada Games

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

Looking to increase student engagement in your classroom without sacrificing content? Come explore Collisions™, a system of interconnected digital chemistry games, and experience gameplay that is both fun and exploratory. Bring a laptop/tablet or use one of our devices to participate in several classroom-ready activities focused on intermolecular forces.

### Engage Students in FOSS Next Generation K–5

(Grades K–5)

B302, GWCC

Science Focus: GEN

Sponsor: Delta Education/School Specialty Science—FOSS

**Brian Campbell**, The Lawrence Hall of Science, University of California, Berkeley

Join the developers to learn about the FOSS Next Generation K–5 Program. We will introduce the FOSS instructional design and illustrate how the system incorporates science-centered language development, science notebooks, digital resources, formative assessments, and outdoor excursions into a coherent three-dimensional teaching and learning experience for students and teachers.

### Wind Turbines: A STEM Approach to Engineering and Design

(Grades 6–11)

B303, GWCC

Science Focus: ETS

Sponsor: CPO Science/School Specialty Science

**Kat Mills**, School Specialty Science, Rosharon, TX

**Erik Benton**, CPO Science/School Specialty Science, Nashua, NH

Plan, build, test, and refine your designs to engineer your very own wind turbine with CPO Science Link Wind Turbine module. With STEM activities and an NGSS approach, you will try to generate the highest voltage using three different blade types or even designing your own!

### Set the Scene for Science Discovery with Forensics

(Grades 6–12)

B304, GWCC

Science Focus: GEN, NGSS

Sponsor: Ward's Science

**Kathy Mirakovits**, Portage Northern High School, Portage, MI

Everyone loves a good mystery—especially students. Learn how to design a mock crime scene, examine evidence with large groups, and incorporate NGSS science and engineering practices and crosscutting concepts. Keep them captivated while honing critical-thinking skills while they practice hands-on lab forensic science techniques.

### Photosynthesis and Respiration Shuffle

(Grades 9–11)

B305, GWCC

Science Focus: LS1.C, LS2.B, PS3, CCC4, CCC5, SEP2, SEP6

Sponsor: Lab-Aids, Inc.

**Mark Koker**, Lab-Aids, Inc., Ronkonkoma, NY

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

### STEM Design Challenge

(Grades 4–8)

B306, GWCC

Science Focus: ETS, PS2

Sponsor: Fisher Science Education

**Lacey Cirinelli** ([lacey.cirinelli@thermofisher.com](mailto:lacey.cirinelli@thermofisher.com)), Fisher Science Education, Pittsburgh, PA

Discover how to create and develop questions about force, energy, and motion for an engaging classroom lab. Then

solve an engineering problem using creative and realistic world processes while supporting your understanding with fun and exciting team competition. Learn how to bring this Project-Based Learning program to your community!

### **Scientists at Work: Bringing Science to Life with HHMI BioInteractive**

(Grades 6–12)

B308, GWCC

Science Focus: LS2.A, LS2.C, LS4.B, CCC1, CCC2, CCC5, CCC7, SEP1, SEP4, SEP5

Sponsor: HHMI BioInteractive

**Sherry Annee** ([sannee@brebeuf.org](mailto:sannee@brebeuf.org)), Brebeuf Jesuit Preparatory School, Indianapolis, IN

**Karen Lucci** ([karenlucci@hvrdsd.org](mailto:karenlucci@hvrdsd.org)), Hopewell Valley Central High School, Pennington, NJ

Our classrooms hold the next generation of scientists. Using free resources from HHMI BioInteractive, explore ways to get students to break the mold of scientist stereotypes and see themselves as tomorrow's scientists. Activities revolve around the nature and process of science for middle school and high school classes.

### **Who's the Panda Daddy? The Bear Facts**

(Grades 9–College)

B310, GWCC

Science Focus: LS

Sponsor: Bio-Rad Laboratories

**Tamica Stubbs**, Bio-Rad Laboratories, Hercules, CA

In some panda breeding programs, females are introduced to multiple male mates. See how you can use PCR to identify the baby panda's daddy. Learn the basics of PCR, run a DNA gel, and analyze real data to identify baby panda's dad.

### **Algae Blooms: Agriculture, Ecology, and Economy**

(Grades 9–College)

B311, GWCC

Science Focus: LS

Sponsor: Bio-Rad Laboratories

**Sherri Andrews**, Bio-Rad Laboratories, Hercules, CA

Teach photosynthesis and cellular respiration together in the context of the dead zone in the Gulf of Mexico. Using algae beads together with an algae bloom case study, your students can engage in authentic inquiry investigations to learn about two connected processes and their ecological and economical implications.

### **Grow GMO Seeds in Your Classroom: Conduct Protein and DNA Analyses Using Lateral Flow Strips and PCR**

(Grades 6–College)

B312, GWCC

Science Focus: ETS, LS

Sponsor: Monsanto Co.

**Valerie Bayes** ([stemeducation.outreach@monsanto.com](mailto:stemeducation.outreach@monsanto.com)), Monsanto Co., Saint Louis, MO

Join industry professionals from Monsanto Company and miniPCR to learn more about genetically modified crops (GMOs). Find out how a GMO is made, the benefits and limitations of the technology, how to use lateral flow strips to test for proteins produced by the GMO plant, and how to use PCR to amplify the inserted DNA in the GMO. Leave with GMO seeds and classroom lesson plans that meet the NGSS.

### **Cool! Can We Do That Again?!**

(Grades 2–9)

B313, GWCC

Science Focus: PS1.A, PS1.B, PS4.A

Sponsor: Educational Innovations, Inc.

**Jeffrey Feidler**, Consultant, Wilmington, DE

Tired of hearing “Do we have to do that!?” from your students? Come check out some of the coolest activities involving polymers, color, and light. Your students will be asking if they can do that again—and again! Door prizes, freebies, and fun!

### **Claims, Evidence, and Reasoning in Action**

(Grades K–5)

B314, GWCC

Science Focus: GEN

Sponsor: Houghton Mifflin Harcourt

**Marjorie Frank**, HMH Author, Brooklyn, NY

Begin with a question; conclude with an argument. This workshop steps participants through a learning experience that breathes life into science literacy skills by traveling and discussing a real-world, hands-on path to the intersection of Claims, Evidence, and Reasoning. By the end, participants will have created a well-formed scientific argument based on an investigation.

### May the Force Be with You

(Grades 1–12)

B403, GWCC

Science Focus: PS

Sponsor: Arbor Scientific

**Dwight “Buzz” Putnam**, Whitesboro High School, Marcy, NY

You will be moved by these engaging force and motion demos presented by award-winning physics teacher Buzz Putnam. These classroom-ready activities include the Stunt Car Lab, the famous Monkey-Hunter “problem,” the vertical versus horizontal acceleration demonstration, a simple way to prove “g” is always the same, and subjecting an unsuspecting teacher to a ride on the Human Dynamics Cart. Teaching tips, lesson ideas, and door prizes.

### Patterns in the Sky: Phenomena and 3-D Instruction for Grades K–1

(Grades K–1)

B404, GWCC

Science Focus: ESS2.D, ESS3.B, ETS1.A, ETS1.B, PS3.B, CCC2, SEP

Sponsor: Amplify

**Sophia Lambertsen** ([amplifyscience@berkeley.edu](mailto:amplifyscience@berkeley.edu)) and **Rebecca Abbott**, The Lawrence Hall of Science, University of California, Berkeley

Experience how students investigate why the sky looks different in various parts of the world while figuring out Earth’s place in the universe. Get a hands-on dive into Amplify Science for Grades K–1, engaging with this new NGSS-designed curriculum from The Lawrence Hall of Science.

### Become a National Geographic Certified Educator

(General)

B406, GWCC

Science Focus: ESS2, ESS3, ETS2, LS2, SEP1, SEP8

Sponsor: National Geographic Society

**Mary Adelaide Brakenridge** and **Meghan Modafferi**, National Geographic Education, Washington, DC

Participants will be introduced to National Geographic’s Learning Framework, which is a set of attitudes, skills, and knowledge areas that embody the attributes of an explorer—one who seeks solutions to our world’s most pressing problems. This session counts as Phase 1 of the free professional learning program known as the Nat Geo Educator Certification Program. Certified educators receive special access to National Geographic education resources and an online community of like-minded peers.

### Inspiring Individuals and Changing Conversations: Consider Hosting a Film Screening

(Grades 3–College)

B407, GWCC

Science Focus: GEN, NGSS

Sponsor: Vaccine Education Center at Children’s Hospital of Philadelphia

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

**Donald Mitchell** ([donald@medicalhistorypictures.com](mailto:donald@medicalhistorypictures.com)), Medical History Pictures, Inc., Haverford, PA

The greatest scientist of the 20th century—most don’t know his name. Come see the amazing story of Maurice R. Hilleman, a man whose goal was to eliminate childhood diseases. His story is inspiring and engaging. After watching the film, get tools for hosting a screening or enhancing classroom discussions.

### Extreme Weather

(Grades 5–12)

B408, GWCC

Science Focus: ESS2.D

Sponsor: Simulation Curriculum Corp.

**Herb Koller**, Simulation Curriculum Corp., Minnetonka, MN

Join us as we examine several hurricanes that have wreaked havoc on Caribbean islands and major American cities. Using Simulation Curriculum’s *The Layered Earth—Meteorology*, we will examine various aspects of these hurricanes and learn how to track future storms. Now available for all platforms, including Chromebooks.

### Integrating Robotics into Your Science Classroom (Grades 5+)

(Grades 5–12)

B409, GWCC

Science Focus: ETS, PS2

Sponsor: LEGO Education

**Laura Jackson**, Retired Science Teacher, Lee’s Summit, MO

Want to prepare your students for STEM-related fields as you bring more engineering and Problem-Based Learning into the classroom? Attend this workshop and learn how to use robotics to teach science principles such as friction, acceleration, and velocity.

**8:00–10:00 AM Elementary Extravaganza**

(Grades P–6)

*Exhibit Hall B-1, GWCC*

Science Focus: GEN

**Sponsored by:**

*Carolina Biological Supply Co., Insect Lore,  
Learning A–Z, Pitsco Education,  
School Specialty Science, and UBTECH Education*

Organized by **Linda Froschauer** ([fro2@me.com](mailto:fro2@me.com)), 2006–2007 NSTA President, Pasadena, Calif.

Visit [bit.ly/2FKT5Fh](http://bit.ly/2FKT5Fh) for a complete list of Extravaganza participants or pick up a program at the door.

This Extravaganza is not to be missed! Join elementary groups of professionals for an exceptional opportunity. Gather resources for use in your classroom immediately. Engaging hands-on activities, strategies to excite and encourage your students, a preview of the best trade books available, information about award opportunities, contacts with elementary science organizations, sharing with colleagues, door prizes, and much more will be available to participants. Walk away with a head full of ideas and arms filled with materials.

Organizations participating in the Elementary Extravaganza include Association of Presidential Awardees in Science Teaching, Council for Elementary Science International, NSTA Preschool–Elementary Committee, *Science & Children* authors and reviewers, and Society of Elementary Presidential Awardees.

**8:00–11:00 AM Short Courses****3D Designing and Using Three-Dimensional Assessments in Your Classroom (SC-5)**

(Grades K–12)

Tickets Required; \$38

*Chastain E, Westin*

Science Focus: GEN, NGSS

**Katie Van Horne** ([@dizzvh](mailto:@dizzvh); [katie.vanhorne@colorado.edu](mailto:katie.vanhorne@colorado.edu)), University of Colorado Boulder

**Tamara Smolek** ([smolekt@michigan.gov](mailto:smolekt@michigan.gov)), Michigan Dept. of Education, Lansing

For description, see Volume 1, page 59.

**Citizen Science Projects That Transform Schoolyards into STEM Labs and Help K–12 Students Make Sense of Phenomena in Nature (SC-6)**

(Grades K–12)

Tickets Required; \$42

*Chastain I/J, Westin*

Science Focus: ESS1, LS2, LS4, CCC1, CCC2, CCC7, SEP3, SEP4, SEP7

**Karan Wood** ([karan@captainplanetfdn.org](mailto:karan@captainplanetfdn.org)), CPF Institute, Atlanta, GA

**Donna Barrett-Williams** ([@donnascience](mailto:@donnascience); [donnajbarrett@gmail.com](mailto:donnajbarrett@gmail.com)), Fulton County Schools, Atlanta, GA

For description, see Volume 1, page 60.



—Photo courtesy of Mike Weiss



### 8:30–9:00 AM Presentations

#### Supporting Students in Creating Investigative Questions

(Grades 7–12)

A403, GWCC

Science Focus: GEN, SEP1

**Michael Zitolo** ([michael.zitolo@gmail.com](mailto:michael.zitolo@gmail.com)) and **Laura Wang** ([laura.cragin.wang@gmail.com](mailto:laura.cragin.wang@gmail.com)), School of the Future, New York, NY

Asking questions is an essential practice of any science classroom. We will share an effective strategy for helping students develop their own investigative questions for labs!



#### Flowcharts and Technical Writing: Using Anatomy Diagrams

(Grades 4–12)

B212, GWCC

Science Focus: LS1.A, CCC6, SEP8

**Matthew Vick** ([mevick@wi.rr.com](mailto:mevick@wi.rr.com)) and **Nancy Stevens** ([stevensn@uww.edu](mailto:stevensn@uww.edu)), University of Wisconsin–Whitewater  
Create a flowchart from a diagram of the heart and lungs to scaffold expository writing that demonstrates an understanding of structure and function in systems.

#### The Science of Plants in Fiction, Poetry, and the Movies

(Grades 5–College)

C202, GWCC

Science Focus: ESS3.C, LS2.A, LS4.D, CCC1, SEP8

**Richard Frazier** ([richard\\_frazier@hotmail.com](mailto:richard_frazier@hotmail.com), [rfrazier@aes.ac.in](mailto:rfrazier@aes.ac.in)), American Embassy School–New Delhi, India

Linking science and humanity increases relevance and expands perspectives. Seeing the science of plants through literature/art enlivens science, fosters collaboration, and remedies “plant blindness.”

#### NGSS 3-D Learning: Using Student-Developed Games to Explore Ecosystem Relationships and Enhance Learning

(Grades 5–College)

Birch, Omni

Science Focus: LS, CCC, SEP

**Raymond Francis** (@RW\_Francis; [franc1rw@cmich.edu](mailto:franc1rw@cmich.edu)), Central Michigan University, Mount Pleasant

**Shelby Goward** (@GowardScience; [shelbygoward2015@gmail.com](mailto:shelbygoward2015@gmail.com)), Ashley (MI) Community Schools

Predator or prey? Come play some student-developed interactive games that provide an outstanding and powerful strategy to explore NGSS three-dimensional learning in ecosystem relationships and population dynamics.

#### SCST-Sponsored Session: RETune Our Understanding of Research Experience for Teachers: Teacher Training That Makes a Difference in the K–12 Classroom

(College)

Hickory, Omni

Science Focus: GEN, NGSS

**Julie Angle** (@sciedu4u; [julie.angle@okstate.edu](mailto:julie.angle@okstate.edu)), Oklahoma State University, Stillwater

Hear about the development and outcome of a special Research Experiences for Teachers (RET) program that pairs preservice and inservice science teachers with research faculty in a yearlong collaborative partnership.

#### PolarTREC in Antarctica: The Long-Term Benefits of Teacher/Researcher Collaboration

(Grades 5–College)

Walnut, Omni

Science Focus: ESS2.A, ESS2.C, ETS2, LS1, LS2, PS1.B, SEP

**Cara Pekarcik** (@MsPekarcik; [carapekarcik@quincypublicschools.com](mailto:carapekarcik@quincypublicschools.com)), North Quincy High School, Quincy, MA

Hear about a PolarTREC (Teachers and Researchers Exploring and Collaborating) research expedition to Antarctica. Experimental research, public outreach, and student connections will be discussed. Lesson plans will be shared, including inquiry and modeling activities.

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### 8:30–9:30 AM Networking Opportunity

#### NSTA President’s International Breakfast Reception

Grand Ballroom E, Omni

Open to international visitors and invited guests. Sponsored by Northrop Grumman Foundation.

### 9:00 AM–5:00 PM Networking Opportunity

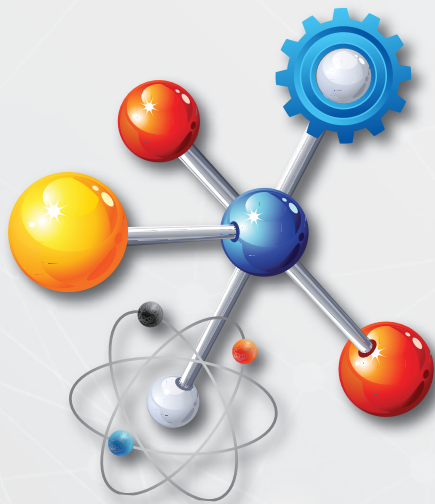
#### NSTA International Lounge

Cypress, Omni

### 9:00 AM–5:00 PM Exhibits

Hall B2, GWCC

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.



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### 9:30–10:00 AM Presentations

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

(Grades 7–12)

A404, GWCC

Science Focus: GEN, SEP

**David Vernet** (@dvernot; [dvernot@gmail.com](mailto:dvernot@gmail.com)), Butler County Educational Service Center, Hamilton, OH

The Cincinnati Enhanced Engineering Math and Science (CEEMS) program at the University of Cincinnati is an NSF-funded math and science partnership for middle school and high school math and science teachers. Find out how secondary teachers developed CBL engineering units through this NSF-funded program. See examples and get access to a searchable database of 300+ of these units.

#### **Project Hero: Catalyzing Empathy for Species in Trouble**

(Grades 4–12)

C202, GWCC

Science Focus: LS2

**Courtney Kimmel** (@CaptainPlantFd; [courtney@captainplanetfdn.org](mailto:courtney@captainplanetfdn.org)), Captain Planet Foundation, Atlanta, GA

Project Hero is a Project-Based Learning system co-developed by a dozen conservation organizations to guide students on “Quests” to help species and ecosystems in trouble.

#### **INF Citizen Science Ecosystem Biodiversity in United States and Abroad (with Lemurs!)**

(Grades 7–12)

C205, GWCC

Science Focus: ESS1.C, ESS3.A, ESS3.B, ESS3.C, ETS, LS, INF, CCC, SEP

**Beth Guzzetta** (@bethguzzetta; [bguzzetta@allendalecolumbia.org](mailto:bguzzetta@allendalecolumbia.org)), Allendale Columbia School, Rochester, NY

Explore ecosystem biodiversity with your students through a citizen science project using cubes and DNA, as we did on campus and in Madagascar with grades 7–12 students.



—Photo courtesy of Jennifer Williams and Mary Ellen Hamner

#### **BILLs and ChILLs: Using Interactive Learning Logs in Biology and Chemistry**

(Grades 9–12)

C212, GWCC

Science Focus: LS, PS, SEP1, SEP2, SEP4, SEP5, SEP7, SEP8

**Jordan Tidrick** (@JordieMcT; [jordantidrick@hotmail.com](mailto:jordantidrick@hotmail.com))

and **Jennifer Johnson** (@JohnsonSciClass; [jennifer.johnson@cobbk12.org](mailto:jennifer.johnson@cobbk12.org)), North Cobb High School, Kennesaw, GA

We will share ideas for implementing Interactive Learning Logs to enhance instruction and improve student understanding and organization. Examples from on-level and AP biology, honors chemistry, and genetics.

#### **Planning and Carrying Out Investigations with GPB's Digital Series, *Chemistry Matters***

(Grades 9–12)

C301, GWCC

Science Focus: PS1.A, PS1.B, SEP3

**Laura Evans** (@GPBEducation; [levans@gpb.org](mailto:levans@gpb.org)), Georgia Public Broadcasting, Atlanta

**Wesley McCoy** (@GPBEducation; [wdmccoy@mindspring.com](mailto:wdmccoy@mindspring.com)), North Cobb High School, Kennesaw, GA

Get to know *Chemistry Matters*, a free digital series for high school from Georgia Public Broadcasting, and learn strategies for planning and carrying out investigations with your students.

#### **A Breath of Fresh Air: A Refreshing Initiative for Outdoor Learning in the Science Curriculum**

(Grades K–12)

Birch, Omni

Science Focus: GEN

**Alexandra Danz** (@danz\_alex; [alexandradanz@wpcsd.k12.ny.us](mailto:alexandradanz@wpcsd.k12.ny.us)), Highlands Middle School, White Plains, NY

Recognize the importance of shifting the regard of outdoor learning in school districts nationwide from a novelty to a staple in science education.

#### **SCST-Sponsored Session: Using a Flexible Approach to Integrating Authentic Research Experiences into a Variety of Introductory Biology Courses**

(College)

Hickory, Omni

Science Focus: LS

**Donald French** ([dfrench@okstate.edu](mailto:dfrench@okstate.edu)), Oklahoma State University, Stillwater

Come learn how we use different approaches to offer students research experiences in their first biology, biochemistry, botany, chemistry, microbiology, and zoology courses.

**9:30–10:30 AM Robert H. Carleton Lecture**  
**My Teaching Career—the Good, the Bad, the Ugly**  
 (General) A407, GWCC  
 Science Focus: GEN



**Edward Ortleb** ([mrsience1@sbeglobal.net](mailto:mrsience1@sbeglobal.net)), 1978–1979 NSTA President, and Science Consultant, Saint Louis, MO

Presider: Jeremy Peacock, Program Coordinator, NSTA Atlanta National Conference, and Northeast Georgia RESA, Athens

Join me for highlights of my teaching career as an elementary teacher, science supervisor, adjunct university professor, and textbook author. We will take a trip down memory lane with the comical and not-so-comical events of my wondrous 40 years in education.

*For decades, Edward Ortleb has lectured, taught, and written prolifically on science education. His many roles include classroom teaching at the primary and intermediate levels, model teaching, curriculum leadership positions, university faculty member, author, and science education consultant. He has written over 100 publications for teachers and students, including textbooks for major publishing companies along with eight science research articles that he authored or co-authored that appeared in juried publications.*

*An NSTA life member since 1963, his service extends from NSTA president (1978–1979) to numerous other positions, such as district director and national conference chair. He has held prominent leadership positions in other science education organizations, including the National Science Supervisors Association and the Science Teachers of Missouri.*

*In retirement, Ed has continued his efforts by serving as a church school board member and doing science lessons with students at the school. He also has assisted the science program at an elementary school in Pacific, Missouri, by providing texts, science supplies, and equipment.*

## 9:30–10:30 AM Presentations

### Protecting the Outer Space Environment

(Grades K–12) A303, GWCC

Science Focus: ESS1.A, ESS1.B, ESS2.A, ESS2.B, ESS2.C, ESS2.D, ESS3.B, ESS3.C, ESS3.D, ETS1.B, CCC, SEP

**Beverly Bachelder** ([bbachelder3@gmail.com](mailto:bbachelder3@gmail.com)), Retired Principal, North Oxford, MA

**Robert Bachelder** ([bob@wamsworks.org](mailto:bob@wamsworks.org)), WAMS, Worcester, MA

Probe how NGSS-focused K–12 instructional resources can help students see orbital space as a valuable natural resource that must be protected from space debris.

### Shell Science Teaching Award: Fueling Success with Students \$10K

(Grades K–12) A304, GWCC

Science Focus: GEN

**Gary Koppelman**, Blissfield Elementary School, Blissfield, MI

Share your passion and practice by applying for this \$10,000 award. Learn from Shell awardees, finalists, and judging panel members important tips to apply for this award, and a trip to next year's national conference in St. Louis!

### Project-Based Learning Marine Science

(Grades 9–College) A401, GWCC

Science Focus: LS2, SEP1, SEP2, SEP4, SEP6, SEP7, SEP8

**Tami Lunsford** ([@TamiTeach](mailto:@TamiTeach); [tami.lunsford@gmail.com](mailto:tami.lunsford@gmail.com)), Newark Charter Junior/Senior High School, Newark, DE

Come learn the basics of PBL and the way one high school teacher is creating a yearlong PBL marine science course.

### The Ring of Fire: Planning a Model-Based Inquiry Unit Around a Puzzling Phenomenon

(Grades 6–8) A402, GWCC

Science Focus: ESS1.A, ESS1.B, ESS2.A, ESS2.B, ESS2.C, ESS2.D, ESS3.B, ESS3.C, ESS3.D, ETS1.B, CCC, SEP1, SEP2, SEP4, SEP6, SEP7, SEP8

**Alissa Berg** ([@alissabberg](mailto:@alissabberg); [alissabberg@gmail.com](mailto:alissabberg@gmail.com)), Academy for Urban School Leadership (AUSL), Chicago, IL

Explore an NGSS-focused Earth science unit in which students engage in evidence gathering and model revision to explain a puzzling science phenomenon.



**Engaging in Scientific Argumentation: How Do I Support My Students in Articulating Their Reasoning?**

(Grades 5–8)

A403, GWCC

Science Focus: GEN, SEP6, SEP7

**María González-Howard** ([mgonzalez-howard@austin.utexas.edu](mailto:mgonzalez-howard@austin.utexas.edu)), The University of Texas at Austin

**Katherine McNeill** ([kmcneill@bc.edu](mailto:kmcneill@bc.edu)) and **Lisa Marco-Bujosa** ([marcobuj@bc.edu](mailto:marcobuj@bc.edu)), Boston College, Chestnut Hill, MA

Are your students struggling with reasoning? Come learn about a website with multimedia resources around argumentation, and engage in instructional activities that support student reasoning!

**Failure Is NOT an Option—It's Required**

(General)

A408, GWCC

Science Focus: GEN, CCC

**Nancy Foote** ([tinkerbello0611@gmail.com](mailto:tinkerbello0611@gmail.com)), Sossaman Middle School, Queen Creek, AZ

Incredible things happen when students (and teachers) embrace the struggle and work through challenges. Join me to enhance your own learning by working through the “failures” and at the same time learn how to help your students become more masterful, more tenacious, more thoughtful learners.

**Data Is Not a Four-Letter Word: Use NOAA Resources to Build Student Proficiency in Data Analysis**

(Grades 5–12)

A412a, GWCC

Science Focus: ESS

**Stephen Zepecki** ([stephen.zepecki@gmail.com](mailto:stephen.zepecki@gmail.com)), NOAA Office of Education, Washington, DC

Scientists at the National Oceanic and Atmospheric Administration collect a stunning array of data in their work. Learn how to access this treasure trove of archived and real-time data, and explore NOAA's data-rich resources, lesson plans, and visualization tools to help you build student proficiency in scientific data analysis.

**NESTA and AMS Share: Using Core Concepts to Build a Robust Earth System Science Foundation**

(General)

B103, GWCC

Science Focus: ESS, SEP

**Wendy Abshire** ([@AMSeducation](mailto:@AMSeducation); [wabshire@ametsoc.org](mailto:wabshire@ametsoc.org)), American Meteorological Society, Washington, DC

Free professional development opportunities! Check out the very successful AMS DataStreme Project—three courses full of real-world data for exploring weather, water, and climate science.



**National Marine Sanctuaries: Bringing Ocean Technology into Your Classroom**

(General)

B402, GWCC

Science Focus: ETS2, LS2

**Claire Fackler** ([@sanctuaries](mailto:@sanctuaries); [claire.fackler@noaa.gov](mailto:claire.fackler@noaa.gov)), NOAA Office of National Marine Sanctuaries, Santa Barbara, CA

Hear about technology that is used in National Marine Sanctuaries. Many of our lesson plans, expeditions, and live telepresence shows focus on the newest technologies used to study and explore the sanctuaries.



**NSTA Press® Session: Building School and District Capacity for Eliciting, Supporting, and Understanding ALL Students' Ideas in Science**

(Grades K–12)

B405, GWCC

Science Focus: GEN, NGSS

**Page Keeley** ([@CTSKeeley](mailto:@CTSKeeley); [pagekeeley@gmail.com](mailto:pagekeeley@gmail.com)), 2008–2009 NSTA President, and The Keeley Group, Fort Myers, FL

**Tonya Woolfolk** ([tonya.woolfolk@hcbe.net](mailto:tonya.woolfolk@hcbe.net)), Houston County School District, Perry, GA

**Joyce Tugel** ([jtugel@gmail.com](mailto:jtugel@gmail.com)), Science Education Consultant, Barrington, NH

**Joel Truesdell** ([jotruesd@ksbe.edu](mailto:jotruesd@ksbe.edu)), Kamehameha Schools, Honolulu, HI

Learn how formative assessment probes and techniques support a culture of formative assessment that engages ALL K–12 learners and their teachers in surfacing, thinking through, and modifying their ideas.

**Using the PTC Gene to Study Mendelian Principles and Evolutionary Trends**

(Grades 9–College)

C204, GWCC

Science Focus: LS

**Steven Oszust**, The Brooklyn International High School, Brooklyn, NY

Through hands-on investigation of the PTC gene, students will develop a deeper understanding of Mendelian genetics and evolutionary trends in human populations.



**Surviving the Zombie Apocalypse**

(Grades 9–12)

C206, GWCC

Science Focus: GEN

**Jackie Mercer** ([jmercer@crestviewlocal.k12.oh.us](mailto:jmercer@crestviewlocal.k12.oh.us)) and **Veronica Kotel**, Crestview High School, Columbiana, OH

A science teacher and English teacher will explain how they used the zombie apocalypse to create an engaging project that focused on science literacy.

# NSTA NATIONAL CONFERENCE ON SCIENCE EDUCATION



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### Powerful Free Simulations for 3-D NGSS Teaching

(Grades K–12) C213, GWCC

Science Focus: PS, CCC, SEP

**Chad Dorsey** (@chaddorsey; [cdorsey@concord.org](mailto:cdorsey@concord.org)), The Concord Consortium, Concord, MA

Come discover how free NSF-funded molecular simulations and curricula from The Concord Consortium can add all three dimensions of the NGSS to your physics, physical science, and chemistry teaching. Take away free tips and resources that you can use immediately to bring NGSS to life in your classroom!

### Small Changes Can Have BIG Impacts: Transforming Today's Science Classroom

(Grades K–12) Dogwood B, Omni

Science Focus: GEN, NGSS

**Chris Embry-Mohr** ([chrisembry.mohr@olympia.org](mailto:chrisembry.mohr@olympia.org)), Olympia High School, Stanford, IL

**Julie Olson** (@KernelSTEM; [julie.olson@k12.sd.us](mailto:julie.olson@k12.sd.us)), Mitchell High School, Mitchell, SD

Transform today's science classroom using the three dimensions of the NGSS, phenomena-driving question boards, engineering design cycles, and bundling.

### Urban STEMification

(Grades K–12)

International Ballroom E, Omni

Science Focus: GEN, SEP

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

Come hear about our journey toward infusing STEM into a large urban school district in Metro-Atlanta. I'll share and discuss what worked and what didn't along the way.

### AMSE-Sponsored Session: Tearing Down Walls, Building Up Relationships

(Grades K–12)

Juniper, Omni

Science Focus: GEN

**Alicia Conerly** (@mrzjconerly25; [mrz\\_conerly@yahoo.com](mailto:mrz_conerly@yahoo.com)), Hazlehurst (MS) City School District

How can we integrate a curriculum showing equity among all students? Relationships are earned...not demanded! No more barriers! Handouts and door prizes given.

### NSELA-Sponsored Session: Close Reading and Science Texts: What Curriculum Leaders Need to Know

(Grades K–6)

Magnolia, Omni

Science Focus: GEN, SEP8

**Christina Argo** ([yongmi.argo@ops.org](mailto:yongmi.argo@ops.org)), Omaha (NE) Public Schools

Attention will be paid on how to design close reading lessons that use science texts to support elementary students on developing their skills to answer text-dependent questions.

### Science Connections Using Fiction Books

(Grades 4–12)

Maple A/B, South Tower, Omni

Science Focus: GEN

**Kyla Gentry** ([kgentry@searcyschools.org](mailto:kgentry@searcyschools.org)) and **Cristina Farley** ([cfarley@searcyschools.org](mailto:cfarley@searcyschools.org)), Ahlf Junior High School, Searcy, AR

Challenge students to discover science while reading fiction novels. Incorporate the CCSS by comparing the science in a fiction text to nonfiction texts.



**9:30–10:30 AM Hands-On Workshops****Teaching Environmental Sustainability Using a Free Place-Based Watershed Model***(Grades 6–12)**A301, GWCC*

Science Focus: LS2, CCC1, CCC4, SEP

**Carolyn Staudt** (@cjstaudt; [cstaudt@concord.org](mailto:cstaudt@concord.org)), Curriculum/Professional Developer, Concord, MA**Nanette Marcum-Dietrich** ([ndietrich@millersville.edu](mailto:ndietrich@millersville.edu)), Millersville University of Pennsylvania, Millersville**Steve Kerlin** ([skerlin@stroudcenter.org](mailto:skerlin@stroudcenter.org)) and **Melinda Daniels**, Stroud Water Research Center, Avondale, PA

Model My Watershed is a free web-based application that invites students to explore the condition of their local watershed with a scientifically valid watershed model.

**Holistic STEM: A Community of Sharing Ground Cloud Observations and Comparing with NASA Satellite Data***(General)**A302, GWCC*

Science Focus: ESS2.D, SEP

**Tina Harte** ([tina.r.harte@nasa.gov](mailto:tina.r.harte@nasa.gov)) and **Marilé Colon Robles** ([marile.colonrobles@nasa.gov](mailto:marile.colonrobles@nasa.gov)), NASA Langley Research Center, Hampton, VA

Explore how student cloud observations through the GLOBE Program supported by NASA subject matter experts and assets enhance classroom STEM experiences.

**Effective Modeling Practices, K–8***(Grades K–2/6–8)**A315, GWCC*

Science Focus: GEN, SEP2

**Lauren McCaughan** ([lauren.mccaughan@environmentalcharterschool.org](mailto:lauren.mccaughan@environmentalcharterschool.org)) and **Jennifer Porter** ([jenlynnporter@gmail.com](mailto:jenlynnporter@gmail.com)), Environmental Charter School, Lower School, Pittsburgh, PA**Laura Micco** ([laura.micco@environmentalcharterschool.org](mailto:laura.micco@environmentalcharterschool.org)) and **Hilary Buttenfield** ([hilary.butenfield@environmentalcharterschool.org](mailto:hilary.butenfield@environmentalcharterschool.org)), Environmental Charter School, Upper School, Pittsburgh, PA

Geared toward grades K–2 and 6–8 educators, this workshop will explore the use of the NGSS key practice of modeling to bring concepts to life.

**STEM Competition: Two Grade 4 Classes and a Unit on Energy***(Grades 3–8)**A316, GWCC*

Science Focus: ESS, ETS, PS3, CCC2, CCC5, CCC6, CCC7, SEP1, SEP3, SEP4, SEP5, SEP6, SEP8

**Marian Prince** ([marian.prince50@gmail.com](mailto:marian.prince50@gmail.com)), Andrews University, Berrien Springs, MI

A unit on alternative energy turned into “Who could design the fastest windmobile, waterwheel, or best solar oven?” The students used technology to measure rates.

**The Role of Argumentation in Project-Based Learning***(Grades 6–12)**A405, GWCC*

Science Focus: GEN, SEP7, SEP8

**Stefanie Phillips** ([stephills@washoeschools.net](mailto:stephills@washoeschools.net)), Depoali Middle School, Reno, NV**Mandi Collins** (@davimand; [mmcollins@unr.edu](mailto:mmcollins@unr.edu)), University of Nevada, Reno

Explore strategies that unite argumentation and Project-Based Learning. Strategies will be presented that engage learners in active reading and evaluation of nonfiction text, the development and assessment of an argument, and communicating information as a scientist as components of PBL.

**Cheap STEM Lessons for the Classroom***(Grades 6–12)**A410, GWCC*

Science Focus: ETS1.C, CCC6, SEP1, SEP2, SEP3, SEP4, SEP6

**Scott Spohler** ([sspohler@gisaoh.org](mailto:sspohler@gisaoh.org)), Global Impact STEM Academy, Springfield, OH

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!

**Evaluate Your Sessions Online!**

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





## NGSS@NSTA Forum Session: What's the Matter with Addie, and What Should We Do with CRISPR? Next Generation Storylines That Connect Science to Student Interests and Concerns

(Grades K–12)

B102, GWCC

Science Focus: LS, CCC, SEP

**William Penuel** ([william.penuel@colorado.edu](mailto:william.penuel@colorado.edu)), University of Colorado Boulder

**Douglas Watkins** (@ScienceEdDPS; @douglas\_watkins) and **Allysa Orwig** (@allysorwig; [allysa\\_orwig@dpsk12.org](mailto:allysa_orwig@dpsk12.org)), Denver (CO) Public Schools

Presider: Ted Willard ([twillard@nsta.org](mailto:twillard@nsta.org)), Assistant Executive Director, Science Standards, NSTA, Arlington, VA

Come get engaged in activities from two high school biology units in evolution and biology that are anchored in phenomena selected to maximize student interest. Both are co-designed by teachers and researchers using the storyline approach developed by Brian Reiser and colleagues. We'll present an overview of the units and the three-dimensional assessments that are embedded within them.

## 3D Phenomenon? Bring It On!

(General)

B401, GWCC

Science Focus: GEN, SEP1, SEP6, SEP7

**Jacqueline Fawaz** ([fawaz.jacqueline@mail.fcboe.org](mailto:fawaz.jacqueline@mail.fcboe.org)), Spring Hill Elementary School, Fayetteville, GA

**Charles Harper** (@harp76; [harper.charles@mail.fcboe.org](mailto:harper.charles@mail.fcboe.org)), Lafayette Educational Center, Fayetteville, GA

**Pat Costa** ([patcosta@att.net](mailto:patcosta@att.net)), Crabapple Lane Elementary School, Peachtree City, GA

Geared toward any level of familiarity with three-dimensional learning, this hands-on experience with phenomena and questioning strategies will help structure student thinking.

## Students Understanding Caffeine and Sugar Toxicity from a Planarian's Perspective

(Grades 6–12)

C201, GWCC

Science Focus: LS

**Rhea Miles** ([milesr@ecu.edu](mailto:milesr@ecu.edu)), East Carolina University, Greenville, NC

**Tonya Little** (@tlittle252; [tmlittle252@gmail.com](mailto:tmlittle252@gmail.com)), Martin County Schools, Greenville, NC

SEADAP stands for Science Education Against Drug Abuse Partnership. Find out how a SEADAP teacher served as a facilitator for middle school students to assist them with designing SEADAP experiments using caffeine, sugar, and an energy drink.

## Describing Data Using Central Tendencies, Graphs, and Statistics in AP and IB

(Grades 9–College)

C203, GWCC

Science Focus: LS1.D, LS2.A, SEP

**Kristen Dotti** ([kristen.dotti@catalystlearningcurricula.com](mailto:kristen.dotti@catalystlearningcurricula.com)), Verde Valley School, Sedona, AZ

Collect data on groups of “mice” and use these sample sets to guide students to making good choices in the use of statistical parameters.

## Revisiting Assessments with Scientific Discourse and Argumentation

(Grades 6–12)

C209, GWCC

Science Focus: ESS2.B, ESS3.D, LS3.A, LS3.B, LS4, PS1.A, CCC1, CCC2, CCC5, CCC7, SEP1, SEP4, SEP7, SEP8

**Christopher Bowen** (@ProfChrisBowen; [bowenc@jc-schools.org](mailto:bowenc@jc-schools.org)), Liberty Bell Middle School, Johnson City, TN

Engage in an activity that deepens students' conceptual understanding, provides opportunities to evaluate scientific information, improves analytical abilities, and strengthens communication skills.

## Supporting NGSS Equity-Oriented High-Leverage Teaching Practices in Middle Grades Engineering

(Grades 6–8)

C210, GWCC

Science Focus: ETS1.B, ETS1.C, PS3.A, PS3.B, SEP1, SEP6

**Angela Calabrese Barton** (@calabresebarton; [acb@msu.edu](mailto:acb@msu.edu)), **Kathleen Schenkel** ([schenk13@msu.edu](mailto:schenk13@msu.edu)), and **Christina Restrepo Nazar** ([crn@msu.edu](mailto:crn@msu.edu)), Michigan State University, East Lansing

Emphasis will be placed on equity-oriented high-leverage teaching practices to support all learners in the NGSS engineering practices of defining problems and designing solutions.

## Moving Beyond Naming Forms: Teaching Energy to Middle School Students Through a System Transfer Approach

(Grades 6–9)

C302, GWCC

Science Focus: PS3

**Katherine Carswell** (@katherinecars; [kcarswell@fenton-schools.org](mailto:kcarswell@fenton-schools.org)), Andrew G. Schmidt Middle School, Fenton, MI

**Israel Touitou** ([touitou@msu.edu](mailto:touitou@msu.edu)), CREATE for STEM Institute, Michigan State University, East Lansing

We will present a modeling-based approach to teaching energy in middle school that focuses on energy transfer between systems as phenomena occur.

### Assessing Student Growth from NGSS: How Do You Know That Your Students Are Really Learning? How Do You Teach Students to Assess Their Own Learning?

(Grades K–12)

Cottonwood A/B, Omni

Science Focus: GEN, NGSS

**Anita Stewart McCafferty** (@AnitaStewartMcC; [anita.stewart@maine.edu](mailto:anita.stewart@maine.edu)), University of Southern Maine, Gorham Campus, Gorham

Experience how K–12 teachers use assessment for learning strategies to show student growth from NGSS and teach students how to accurately self-assess their learning.

### Combine Scientists, Data, Media, and Interactives in the Science Classroom to Immerse Students in the Science

(Grades 5–College)

Dogwood A, Omni

Science Focus: LS2, CCC1, CCC7

**Kristin Hunter-Thomson** (@ru\_dataspire; [hunterthomson@marine.rutgers.edu](mailto:hunterthomson@marine.rutgers.edu)), Rutgers Cooperative Extension, Dataspire, New Brunswick, NJ

**Ariel Zych** (@arieloquent; @scifri) and **Xochitl Garcia** (@msxgarcia), Science Friday, New York, NY

Expose your students to science from all sides, as they meet scientists, dive into original data, and become immersed in the world of research.

### Inside an Outbreak Investigation with CDC: Strategies for Teaching Public Health in the Classroom

(Grades 6–College)

Grand Ballroom B, Omni

Science Focus: LS, CCC1, CCC2, CCC4, SEP1, SEP2, SEP3, SEP4, SEP5, SEP8

**Kelly Cordeira** (#cdcteach; [scienceambassador@cdc.gov](mailto:scienceambassador@cdc.gov)), Centers for Disease Control and Prevention, Atlanta, GA

Take part in an outbreak investigation case study with CDC staff that engages students in STEM concepts and introduces students to careers in public health.

### STEAM from the Street!

(Grades 5–10)

International Ballroom D, Omni

Science Focus: GEN, NGSS

**Judith Lederman** ([ledermanj@iit.edu](mailto:ledermanj@iit.edu)), **Katie Rupe**, and **Norman Lederman** ([ledermann@iit.edu](mailto:ledermann@iit.edu)), Illinois Institute of Technology, Chicago

We will highlight activities that allow students to identify how and where STEAM connections are authentically integrated into the jobs of the people they encounter daily.

### ASTE-Sponsored Session: New Teacher Preparation Standards to Meet the Needs of the Framework

(General)

Spruce, South Tower, Omni

Science Focus: GEN, NGSS

**Patricia Morrell** ([morrell@up.edu](mailto:morrell@up.edu)), University of Portland, OR

**Gillian Roehrig** (@ghroehrig; [roehr013@umn.edu](mailto:roehr013@umn.edu)), ASTE President, and STEM Education Center, St. Paul, MN

**William Veal** ([vealw@cofc.edu](mailto:vealw@cofc.edu)), College of Charleston, SC

**Eric Pyle** ([pyleej@jmu.edu](mailto:pyleej@jmu.edu)), James Madison University, Harrisonburg, VA

We will share how a joint ASTE/NSTA Ad-Hoc Committee has been updating the teacher preparation standards to correspond to the NRC Framework. We seek your input on this important work.





—Photo courtesy of Jacob Slaton

### 9:30–10:30 AM Exhibitor Workshops

#### **Ideas for Teaching About Earthquakes and Earth Structure in an NGSS Classroom**

(Grades 6–12)

B216, GWCC

Science Focus: ESS2.B

Sponsor: Pearson Learning Services

**Michael Wyssession**, Washington University in St. Louis, MO

Join geophysics professor Michael Wyssession, a lead writer of the NGSS, as he discusses exciting new discoveries about earthquakes and the structure of Earth and provides activities that can be directly incorporated into NGSS-focused curricula. Discussion includes an overview of K–12 educational tools developed at IRIS (Incorporated Research Institutions for Seismology).

#### **Science Teacher/STEM Teacher: What's the Difference?**

(Grades K–12)

B301, GWCC

Science Focus: GEN, NGSS

Sponsor: National Institute for STEM Education

**Judy Zimny** ([jzimny@nise.institute](mailto:jzimny@nise.institute)) and **Whitney Dove** ([wdove@nise.institute](mailto:wdove@nise.institute)), National Institute for STEM Education, Houston, TX

Distinguishing between science and STEM is important as teachers integrate STEM into their practice. Join us to discuss the unique nature of STEM, the research-based instructional strategies necessary to support its outcomes, and a STEM certification pathway that encourages self-reflection and growth in STEM teaching.

#### **Hands-On: Strategies to Teach Adaptations**

(Grades 6–8)

B315, GWCC

Science Focus: LS1.C, LS3, CCC5, CCC6, SEP2, SEP7

Sponsor: PASCO scientific

**Fran Zakutansky**, PASCO scientific, Roseville, CA

How can students understand the balance between environmental conditions and a living organism? Have your students model the conditions of the Arctic and explore how organisms can adapt to the cold. Then use the Wireless temperature sensor to see which adaptations are best at keeping in the heat.

#### **Crash Barrier: How to Design a STEM Engineering Challenge**

(Grades 7–12)

B316, GWCC

Science Focus: ETS, PS, CCC2, CCC5, CCC6, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8

Sponsor: PASCO scientific

**Brett Sackett**, PASCO scientific, Roseville, CA

Understand and explore the relationship between momentum and impact forces by making real-time measurements of collisions. Design your own crash barrier to minimize the maximum collision force of a moving cart colliding into your barrier. Then analyze your results to iterate and improve on your original design.



**9:30–11:00 AM Featured Presentation****NASA: Your STEM Connection**

(General)

B206, GWCC

Science Focus: GEN



Mike Kincaid



Scott Tingle

**Mike Kincaid**, Associate Administrator for Education, NASA Headquarters, Washington, DC

**Scott Tingle**, NASA Astronaut, NASA Johnson Space Center, Houston, TX

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

We engage the nation in NASA's mission and seek to create unique opportunities for students to engage in our journey of exploration and discovery. Come join us to see how you can bring the International Space Station and other exciting NASA work into your classroom. In addition, we will hear from Astronaut Scott Tingle aboard the International Space Station via a special downlink, courtesy of NASA.

**Scott Tingle** is a Commander in the U.S. Navy. He was the assistant program manager/systems engineer for the Standoff Land Attack Missile (SLAM) and Harpoon weapon systems when selected by NASA in 2009. He qualified as an astronaut in 2011. As a Navy pilot, Capt. Tingle has accumulated more than 4,500 flight hours in 51 types of aircraft, 750 carrier arrestments, and 54 combat missions. He is currently assigned as a flight engineer to International Space Station Expeditions 54/55, Soyuz MS-07 launched in December 2017.

**Mike Kincaid** is NASA's associate administrator for the Office of Education, responsible for spearheading the agency's education programs and strengthening student and educator involvement in STEM through NASA's missions, workforce, facilities, research, and innovations. He also chairs NASA's Education Coordinating Committee, an agency-wide collaborative structure that maximizes NASA's ability to manage and implement its education portfolio.

Mike has served NASA for nearly 30 years. He first joined NASA's Johnson Space Center in Houston, Texas, as an intern in 1987 and has led the center in various capacities, including director of Education, deputy director of Human Resources, and deputy chief financial officer.

**9:30–11:00 AM Hands-On Workshop****Global Initiatives Enhancing Science Education: An International Share-a-Thon and Poster Session**

(General)

Grand Ballroom E, Omni

Science Focus: GEN

**Kay Lembo**, Griffith University, Southport, Queensland, Australia

Join us to hear about international initiatives and programs on a diverse area of science education, including formal elementary to college science education, best practices, novel content delivery, scientific literacy, policy standards, and informal education.

Visit [bit.ly/2Fk6pmn](http://bit.ly/2Fk6pmn) for a complete list of presenters.

**10:00–10:30 AM Presentations****Starting with Engineering and Group Work**

(Grades 9–12)

A404, GWCC

Science Focus: ETS1, CCC1, CCC3, SEP1, SEP2, SEP3, SEP7, SEP8

**Joe Cossette** (@cossettej; [cossettej@gmail.com](mailto:cossettej@gmail.com)), Minnetonka High School, Minnetonka, MN

Discover how an introductory unit can be refocused from generic science skills to engineering and group work practices that set the stage for a successful year.

**INF A Bird in the Hand**

(Grades 1–12)

C202, GWCC

Science Focus: LS, INF

**Ashley Endicott** (@MsAEndicott; [aum\\_santeria@yahoo.com](mailto:aum_santeria@yahoo.com)), Fickett Elementary School, Atlanta, GA

**Lindsay Glasner** (@BirdSleuth; [lig27@cornell.edu](mailto:lig27@cornell.edu)), The Cornell Lab of Ornithology, Ithaca, NY

Grab your mobile device and join us to explore tools and apps for bird-related investigations and citizen science.

**NGSS-Ready Project-Based Ecology**

(Grades 6–12)

C205, GWCC

Science Focus: LS2, CCC4, CCC5, CCC7, SEP

**Sara Neufeld** and **William Colazas**, Segerstrom High School, Santa Ana, CA

Incorporating PBL with NGSS? Leave with resources for a hands-on project where students learn ecology content by engaging in science and engineering practices.



### Science Practices Developed with a STEM School Garden Curriculum

(Grades 6–12)

C207, GWCC

Science Focus: GEN, SEP

**Carmen Carrion** ([ccarrion1@student.gsu.edu](mailto:ccarrion1@student.gsu.edu)), Georgia State University, Atlanta

Hear how participation in a school garden with a STEM-aligned curriculum by the Captain Planet Foundation can help students develop science practices.

### A Few of Our Favorite Chemistry Things

(Grades 9–12)

C212, GWCC

Science Focus: PS1, SEP2, SEP4, SEP5, SEP7, SEP8

**Jordan Tidrick** ([@JordieMcT](mailto:@JordieMcT); [jordantidrick@hotmail.com](mailto:jordantidrick@hotmail.com)) and **Nena Tippens** ([nena.tippens@cobbk12.org](mailto:nena.tippens@cobbk12.org)), North Cobb High School, Kennesaw, GA

We will share our favorite chemistry introductory, conceptual, and review activities. Join us for instructions, how-tos, and tips/tricks for using these activities.

### The Use of Self-Regulated Learning to Help Students Perform Science and Engineering Processes

(Grades 6–12)

C301, GWCC

Science Focus: GEN, SEP

**Erin Peters-Burton** ([@CSEsquared](mailto:@CSEsquared); [epeters1@gmu.edu](mailto:epeters1@gmu.edu)), George Mason University, Fairfax, VA

Discussion centers on understanding the learning processes in self-regulated learning while engaged in science and engineering practices.

### SCST-Sponsored Session: Do Majors and Nonmajors Have Similar Perceptions of Course-Embedded Undergraduate Research Experiences?

(College)

Hickory, Omni

Science Focus: GEN

**Donald French** ([dfrench@okstate.edu](mailto:dfrench@okstate.edu)), Oklahoma State University, Stillwater

Review results from surveys examining students' learning mind-set, motivation, and perception of research processes in research-oriented introductory classes among life science, other science, and nonscience majors.

### 3-D Interactive Notebooks Made Equitable, Engaging, and Easy

(Grades 3–12)

Walnut, Omni

Science Focus: GEN, NGSS

**Katrina Scherben**, Harlem Children's Zone Promise Academy Schools, New York, NY

Interactive notebooks can empower diverse learners and promote scientific literacy. Receive classroom-ready strategies for all grades and disciplines that are manageable with any workload.

### 10:00–11:30 AM Exhibitor Workshops Plants, Bessbugs, and Squid: Build Understanding of Structure and Function

(Grades K–5)

B201, GWCC

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

#### Carolina Teaching Partner

How does the structure of plants, bessbugs, and squid help them survive? Why does NGSS suggest that students learn better through a coherent learning progression? Can science be taught in 30-minute lessons? Experience this new module bringing the best of the Smithsonian to science, engineering, and literacy connections for primary students.

### Comparative Vertebrate Anatomy with Carolina's Perfect Solution® Specimens

(Grades 9–12)

B202, GWCC

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

#### Carolina Teaching Partner

Explore animal diversity by comparing anatomical adaptations of the pig, rat, dogfish, and frog. Participants use hands-on dissection to identify characteristics of these popular vertebrates. This is an excellent comparative dissection activity featuring our very best Carolina's Perfect Solution specimens.

### Support Your Students in Their Scientific Journey with Flinn's Digital Resources

(Grades 4–College)

B203, GWCC

Science Focus: GEN

Sponsor: Flinn Scientific, Inc.

**Mike Marvel** ([mmarvel@flinnsci.com](mailto:mmarvel@flinnsci.com)) and **Amy Kinsman** ([akinsman@flinnsci.com](mailto:akinsman@flinnsci.com)), Flinn Scientific, Inc., Batavia, IL

Are you looking for digital resources you can use tomorrow to engage your students and support their understanding of the science curriculum? Come explore a variety of digital products Flinn has to offer, ranging from free resources to low-cost subscriptions. A variety of activities, videos, and curricular content allow you to personalize learning to help students master key concepts and skills with anytime, anywhere access. Visit [www.flinnsci.com](http://www.flinnsci.com) for more information.

### Hands-On Activities to Model Sampling, Habitat Degradation, and Animal Choice

(Grades K–12)

B204, GWCC

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

#### Carolina Teaching Partner

Nurture students' curiosity! Investigate methods used by scientists to estimate population sizes and then create a terrestrial model to observe how pill bugs respond to habitat degradation. Use inquiry to develop experiments to observe the habitat preference of bess beetles and millipedes. Let the excitement in your classroom begin!

### Chemistry with Vernier

(Grades 9–College)

B207, GWCC

Science Focus: ETS, PS1, PS3, PS4

Sponsor: Vernier Software & Technology

**Nüsret Hisim** ([info@vernier.com](mailto:info@vernier.com)), Vernier Software & Technology, Beaverton, OR

Participate in fun and engaging hands-on experiments using Vernier digital tools to measure intermolecular attractions,

investigate pressure and volume relationships, and explore spectroscopy. See how sensor-based experiments teach students about data collection and analysis—practices that promote science inquiry, improve science literacy, and boost test scores.

### Explore Motion with Vernier Video Physics for iOS

(Grades 7–College)

B208, GWCC

Science Focus: ETS2, PS2

Sponsor: Vernier Software & Technology

**Verle Walters** ([info@vernier.com](mailto:info@vernier.com)), Vernier Software & Technology, Beaverton, OR

Interested in creating and analyzing videos using iPad, iPhone, or iPod Touch? Attend this hands-on workshop to explore science concepts of motion and to discover best practices for capturing videos you can use with the Vernier Video Physics app. Automated object tracking streamlines data collection and analysis.

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Science  
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Association

### Three-Dimensional Learning in the Elementary Classroom

(Grades K–8)

B209, GWCC

Science Focus: GEN, NGSS

Sponsor: TCI

**Christy Sanders**, TCI, Mountain View, CA

Join TCI as we explore three-dimensional learning in the NGSS. Participants will be immersed in a Bring Science Alive! investigation and learn ways to implement project-based science in the classroom. We will examine how to actively engage students in science and engineering practices and apply crosscutting concepts with fun and exciting investigations.

### AP Biology Unwrapped: Discover the Keys to AP Exam Success

(Grades 9–12)

B213, GWCC

Science Focus: LS

Sponsor: McGraw-Hill Education

**Gordon Massengill**, Lyceum Academy of New Hanover High School, Wilmington, NC

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

### Using Molymod Model Kits to Enhance Instruction in Biology “the Building Blocks of Life” and Chemistry

(Grades 6–12)

B214, GWCC

Science Focus: LS, PS

Sponsor: molymod models, Spiring Ltd.

**Tanya Katovich** and **Suzanne Fetherling**, Hoffman Estates High School, Hoffman Estates, IL

Drawing molecules on paper or viewing onscreen can make it challenging for kids to understand and visualize molecular structure and how they combine. Discover how you can use Molymod molecular model kits to enhance learning. Emphasis will be placed on 3-D structures of biological molecules, construction of geometric isomers, building functional groups, and monomers formations and their interactions to create larger 3-D polymer molecules, namely the building blocks of life. Take home Molymod model kits while supplies last.

### Spicing Up Classical Physics

(Grades 9–College)

B215, GWCC

Science Focus: PS

Sponsor: Perimeter Institute

**Tonia Williams** ([outreach@perimeterinstitute.ca](mailto:outreach@perimeterinstitute.ca)), Perimeter Institute for Theoretical Physics, Waterloo, ON, Canada

Get the opportunity to engage with Perimeter’s best hands-on activities. We will show you great ways to cover your traditional science standards with lessons that are applied to interesting concepts in modern physics that your students will love!

### Big Data in the Classroom: Teaching About Earth with Authentic Data for Middle School and High School

(Grades 6–12)

B217, GWCC

Science Focus: ESS, SEP

Sponsor: PBS LearningMedia/WGBH

**Jacob Foster** ([jake\\_foster@wgbh.org](mailto:jake_foster@wgbh.org)), WGBH Education, Brighton, MA

**Nancy Gifford**, Monomoy Regional Middle School, Chatham, MA

Learn how you can encourage the development of your students’ skills in analyzing and interpreting authentic scientific data. Students can develop their scientific practice skills with free digital media tools and resources from PBS LearningMedia, produced by WGBH in collaboration with NASA and other partners.

### Unpacking the NGSS Through Instructional Practices

(Grades K–12)

B218, GWCC

Science Focus: GEN, NGSS

Sponsor: Measured Progress

**Deborah Farrington** ([farrington.deborah@measuredprogress.org](mailto:farrington.deborah@measuredprogress.org)) and **Jessica Yonker** ([yonker.jessica@measuredprogress.org](mailto:yonker.jessica@measuredprogress.org)), Measured Progress, Dover, NH

Learn what goes into high-quality NGSS-focused assessments and hear how districts are implementing three-dimensional assessment into instruction. We will demonstrate high-quality science assessment and ideas for student engagement through formative assessment activities, classroom strategies, and support tools.

### What Do Crosscutting Concepts Look Like in an Elementary Classroom

(Grades K–5)

B302, GWCC

Science Focus: GEN, CCC

Sponsor: Delta Education/School Specialty Science—FOSS

**Brian Campbell**, The Lawrence Hall of Science, University of California, Berkeley

FOSS modules provide students with opportunities to use crosscutting concepts to deepen their understanding of science content. Engage with phenomena that expose cause and effect, patterns, and structure and function. We will share ways for students to progress in their understanding of crosscutting concepts as organizing principles.

### Go on a Cell Quest! Teaching Cell Structure Through Gaming

(Grades 6–12)

B303, GWCC

Science Focus: LS

Sponsor: CPO Science/School Specialty Science

**Kat Mills**, School Specialty Science, Rosharon, TX

**Erik Benton**, CPO Science/School Specialty Science, Nashua, NH

Your quest, should you choose to accept it, is to explore cell structure in 3D with new CPO Science Link Cell Quest! Go on a cell structure and function adventure using cutting-edge Augmented Reality, then use your knowledge to complete a quest in one of eight different cell types.

### NGSS Curriculum Made Easy with Discovery Education™ and Ward's Science

(Grades K–8)

B304, GWCC

Science Focus: GEN, NGSS

Sponsor: Ward's Science

**Brad Fountain**, Discovery Education™, Silver Spring, MD

Looking for a complete curriculum solution to teach NGSS across your entire science program? Join us to learn about the new Discovery Education Techbook™, a digital textbook, along with Discovery Education TechKits™ by Ward's Science, curriculum-focused kits for hands-on activities—both meet the NGSS. Try the products, ask questions, and explore this complete solution.

### Cell Differentiation and Gene Expression

(Grades 9–11)

B305, GWCC

Science Focus: LS1.A, LS1.B, LS3, CCC1, CCC4, CCC6, SEP2, SEP6

Sponsor: Lab-Aids, Inc.

**Mark Koker**, Lab-Aids, Inc., Ronkonkoma, NY

Students often have trouble conceptualizing how selective gene expression works. We will use manipulatives to teach

this concept and explain how it is connected to genetic engineering. Innovative activities are selected from the new *Science and Global Issues: Biology* program from SEPUP and Lab-Aids. Activities focus on ways to integrate selective gene expression as a relevant and engaging sustainability issue.

### The Chemistry of Glow Sticks

(Grades 9–12)

B306, GWCC

Science Focus: PS

Sponsor: Fisher Science Education

**April Fischione** ([april.fischione@thermofisher.com](mailto:april.fischione@thermofisher.com)), Fisher Science Education, Pittsburgh, PA

Relive your childhood by making your own glow stick. You may have wondered what happens when you snap a glow stick that causes it to glow. Join us for a fun chemistry experiment where you will create a glowing chemical reaction.

### Biology and Geology: Co-Evolving Over Time

(Grades 6–12)

B308, GWCC

Science Focus: ESS1.C, ESS2.A, ESS2.D, ESS2.E, ESS3.C, ESS3.D, LS4.D, CCC1, CCC2, CCC5, CCC7, SEP2, SEP4, SEP6, SEP7

Sponsor: HHMI BioInteractive

**Margaret Holzer** ([mholzer@monmouth.com](mailto:mholzer@monmouth.com)), Chatham High School, Chatham, NJ

**Bernice O'Brien** ([bobrien@bisd303.org](mailto:bobrien@bisd303.org)), Bainbridge High School, Bainbridge Island, WA

Are we living in a new geologic epoch? Use free HHMI BioInteractive resources to get students to use scientific argumentation. Leave with classroom-ready resources and connections between biology and Earth science, two domains of science that are highlighted by NGSS, but are typically separated in school curricula.

### Fascinate Your Students with Glowing Bacteria

(Grades 9–College)

B310, GWCC

Science Focus: LS

Sponsor: Bio-Rad Laboratories

**Tamica Stubbs**, Bio-Rad Laboratories, Hercules, CA

Make bacteria glow fluorescent green in this hands-on transformation lab. Bacterial transformation is one of the most important techniques in genetic modification and medicine production.



**Math and Modeling Together! Improving Students' Quantitative Skills in Biology**

(Grades 9–College)

B311, GWCC

Science Focus: LS

Sponsor: Bio-Rad Laboratories

**Damon Tighe**, Bio-Rad Laboratories, Hercules, CA

Learn to apply appropriate mathematical models and statistics to real student data from essential hands-on biology labs. Discussed mathematical models and statistical calculations include averages, standard deviation, bar graphs, standard curves, reaction rates, and Chi-squared analysis.

**GMOs Are a Hot Topic in the Media, Classroom, and Around the Dinner Table: Panel Discussion and Presentation by Monsanto Company**

(General)

B312, GWCC

Science Focus: GEN

Sponsor: Monsanto Co.

**Valerie Bayes** ([stemeducation.outreach@monsanto.com](mailto:stemeducation.outreach@monsanto.com)), Monsanto Co., Saint Louis, MO

Monsanto Company scientists will discuss what a GMO is and isn't, how these innovations are tested, the limitations and benefits of the technology, and where biotechnology is used outside of agriculture today. Find out how Monsanto is partnering with others in the agriculture industry to help farmers continue to grow food for a growing population while remaining sustainable and environmentally conscious.

**Fantastical Chemistry Demos for All Classrooms**

(Grades 3–12)

B313, GWCC

Science Focus: PS1.A, PS1.B, PS2.B, PS3.B, PS3.D, PS4.B

Sponsor: Educational Innovations, Inc.

**William Richey**, Xenia High School, Xenia, OH

These super fun and exciting chemistry demonstrations can be used by all teachers at any level to get your students excited about the amazing world of chemistry. These easy and practical demonstrations will truly show your students what we already know—that science is fun!

**An NGSS Approach to Challenging Concepts in Chemistry**

(Grades 9–12)

B314, GWCC

Science Focus: PS

Sponsor: Houghton Mifflin Harcourt

**Michael DiSpezio**, HMH Author, Broadcast Host, and Global Educator, North Falmouth, MA

From computational modeling to self-directed inquiry in chemiluminescence and thermochemistry, this workshop offers ideas and hands-on examples that illustrate retooling chemistry to NGSS practices.

**Seeing Is Believing: Physics Demonstrations to Energize Your Classroom**

(Grades 6–8)

B403, GWCC

Science Focus: PS

Sponsor: Arbor Scientific

**Dwight “Buzz” Putnam**, Whitesboro High School, Marcy, NY

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

**Establishing an Orangutan Reserve: Phenomena and 3-D Instruction for Grades 2–5**

(Grades 2–5)

B404, GWCC

Science Focus: ESS2.D, ESS3.B, ETS1, CCC1, SEP1, SEP3, SEP4, SEP5, SEP7, SEP8

Sponsor: Amplify

**Sophia Lambertsen** ([amplifyscience@berkeley.edu](mailto:amplifyscience@berkeley.edu)) and **Rebecca Abbott**, The Lawrence Hall of Science, University of California, Berkeley

Experience how students investigate which locations are most suitable for a population of orangutans while analyzing data and figuring out principles of global weather and climate patterns. Get a hands-on dive into Amplify Science for Grades 2–5, engaging with this new NGSS-designed curriculum from The Lawrence Hall of Science.

**AP Biology: BIOZONE Showcases the New 2017 Editions**

(Grades 10–12)

B406, GWCC

Science Focus: LS

Sponsor: BIOZONE International, Ltd.

**Richard Allan**, BIOZONE International, Ltd., Hamilton, New Zealand

BIOZONE's new 2017 editions present an innovative approach for teaching AP biology within the thematic framework of the four big ideas. Find out how our pedagogical approach can improve student achievement by emphasizing inquiry and critical thinking, using open questioning and paper interactives to promote understanding through modeling. Take home free books.

**The Science of Vaccines: Your Questions Answered**  
(General) B407, GWCC

Science Focus: LS

Sponsor: Vaccine Education Center at Children's Hospital of Philadelphia

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

**Paul Offit**, Vaccine Education Center at Children's Hospital of Philadelphia, PA

Do your students come to you with questions about vaccines? How about other teachers or friends? Maybe you have your own questions? Join in to find out the state of vaccine science and get your questions answered by one of the country's leading vaccine experts, Dr. Paul Offit.

**A Close Encounter with the Red Planet**

(Grades 5–12)

B408, GWCC

Science Focus: ESS1.B

Sponsor: Simulation Curriculum Corp.

**Herb Koller**, Simulation Curriculum Corp., Minnetonka, MN  
This summer, Mars will be one of the brightest objects in the

night sky. Join us as we use the award-winning *Starry Night* to investigate the circumstances of this close approach. A complete, classroom-ready curriculum, *Starry Night* is available for all grade levels and platforms, including Chromebooks.

**Gears, Wheels, Axles, Levers, and Pulleys: How Do They Lay the Foundation for Robotics?**

(Grades P–8)

B409, GWCC

Science Focus: ETS, PS2

Sponsor: LEGO Education

**Laura Jackson**, Retired Science Teacher, Lee's Summit, MO

Discover the fundamentals of robotics by exploring the underpinnings of more complex machines. Build and experiment with gears, wheels, axles, levers, and pulleys as you work through real-world engineering problems. This workshop will teach educators how to lay a solid foundation for more advanced robotics learning.

**DOROTHY K. CULBERT CHAPTER  
AND ASSOCIATED GROUPS  
ROUNDTABLE**

Are you a Chapter or Associated Group leader with a proven track record of moving your organization forward?

Or do you struggle with issues like membership, board relations, and conference planning?

Join us for this networking opportunity to share your experience and learn from other leaders who are “in the trenches” just like you. NSTA’s Chapter Relations staff will be available to offer their expertise, and Chapters and Associated Groups celebrating special anniversaries will be recognized.

**Refreshments provided.**

**Friday, March 16**

**3:00–4:00 PM**

Omni Atlanta Hotel at CNN Center  
Hazelnut

**NSTA** National  
Science  
Teachers  
Association

**10:00 AM–12 Noon Community Connections Featured Presentation and Panel**  
**INF Spare Parts: Reinventing Engineering Education for the 21st Century**  
(General) B101, GWCC  
Science Focus: ETS, INF

**Speaker**

**Faridodin “Fred” Lajvardi** (@falconmaster; coach-fredi@hotmail.com), Nationally Recognized STEM Educator, Phoenix, AZ

**Moderator**

**Ed Barker** (edbarker@kellrobotics.org), Executive Director, Kell Robotics, and Assistant Director for Research Technology and High-Performance Computing, Kennesaw State University, Kennesaw, GA

**Panelists:**

**Woodie Flowers**, Pappalardo Professor Emeritus of Mechanical Engineering, Massachusetts Institute of Technology, and Distinguished Partner at Olin College, Cambridge

**Craig Forest**, Associate Professor of Bioengineering and Founder of The Invention Studio, Georgia Institute of Technology, Atlanta

**Lonnie G. Johnson**, Founder and President, Johnson Research and Development Co., Atlanta, GA

**Danielle Newman** (danielleannenewman@gmail.com), Executive Director, Kell Robotics Team, Kell Robotics, Kennesaw, GA



Fredi Lajvardi



Ed Barker



Woodie Flowers



Craig Forest



Lonnie G. Johnson



Danielle Newman

Fredi Lajvardi will open this two-hour featured presentation and panel with an engaging story about how he led a group of high school teenagers to achieve the impossible—defeating leading universities in an underwater robotics competition.

Next we will hear from engineering education pioneer Woodie Flowers, who co-founded *FIRST* Robotics Competition along with Dean Kamen. Completing our panel will be Craig Forest, founder of the acclaimed Georgia Tech Invention Studio; Lonnie Johnson, former NASA spacecraft engineer and inventor of the Super Soaker; and Danielle Newman, executive director of Kell Robotics. The moderator will be Ed Barker, the 2011 NSTA Faraday Award recipient.

*Faridodin “Fred” Lajvardi was the program manager for the Marine Science Magnet Program at Carl Hayden High School in Phoenix. A teacher at Carl Hayden High School for over 28 years, Fredi led the Falcon Robotics Team, an extracurricular STEM program that has received national and worldwide recognition. In 2004, the team had its breakout moment when students from the robotics team went to the MATE National ROV Championships in Santa Barbara, California, and came back as national champions. The Carl Hayden team went on to win other national competitions in the field of robotics.*

*Several films have been made about the success of his “underdog” Falcon Robotics team and how the team revolutionized STEM education at Carl Hayden High School and dramatically increased the number of students going into engineering and technical fields.*

*Among his many accolades, Fredi received the 2015 Cesar Chavez Foundation Leadership Award and the 2015 Science Foundation Arizona’s Arizona Innovation Hero’s Award.*

**10:00 AM–4:00 PM Short Course****The World Ender: A STEAM PBL Unit (SC-7)**

(Grades 6–8) Tickets Required; \$58 Augusta B/C, Westin  
Science Focus: ESS1.A, ESS1.B, ESS2.A, ETS1, PS2.A, PS4.A, CCC2, CCC3, CCC4, SEP

**Cynthia Hall** ([hallcr@cofc.edu](mailto:hallcr@cofc.edu)) and **Cassandra Runyon** ([runyonc@cofc.edu](mailto:runyonc@cofc.edu)), College of Charleston, SC

**Rhett Nettles** ([rnettles@s2temsc.org](mailto:rnettles@s2temsc.org)), S2TEM Centers SC, Goose Creek, SC

**Elizabeth (Betsy) O'Day** ([betsy.oday@gmail.com](mailto:betsy.oday@gmail.com)), Hallsville Intermediate School, Hallsville, MO

**Maria Royle** ([mdr0303@gmail.com](mailto:mdr0303@gmail.com)), R.B. Stall High School, North Charleston, SC

For description, see Volume 1, page 60.

**10:00 AM–5:00 PM Short Course****Developing a Reasonable NGSS Transition Plan for My District or School (SC-8)**

(Grades K–12) Tickets Required; \$48 Chastain D, Westin  
Science Focus: GEN, NGSS

**Nicholas Balisciano** ([@STEMNick](mailto:@STEMNick); [nbalisciano@ctscience-center.org](mailto:nbalisciano@ctscience-center.org)) and **Gail Emilsson**, Connecticut Science Center, Hartford

For description, see Volume 1, page 60.

**10:15–10:45 AM Presentations****Meet Me in the Middle Session: GIS Learning: Your Next Superpower**

(Grades 6–8) A311, GWCC  
Science Focus: ESS2, ESS3, LS2

**Lisa Wininger** ([@LisaWininger](mailto:@LisaWininger); [lisa.a.wininger@nasa.gov](mailto:lisa.a.wininger@nasa.gov)), Einstein Fellow, NASA Headquarters, Washington, DC

How can you use GIS software to teach three-dimensional real-world issues? Learn how STEM lessons incorporating mapping, data analysis, and presentation can answer questions about phenomena like geologic hazards, climate change, and invasive species.

**Meet Me in the Middle Session: Everyday Engineering**

(Grades 5–9) A312, GWCC  
Science Focus: ETS, SEP

**Richard Moyer**, Professor Emeritus, University of Michigan–Dearborn

Hear about hands-on engineering activities that aren't done everywhere else! Let's look at how everyday objects are designed—ballpoint pens, ear buds, and zip-seal plastic baggies.

**Meet Me in the Middle Session: Patterns: Investigating Weather and Climate—Graph and Analyze Online, Easily and for Free**

(Grades 6–8) A313, GWCC  
Science Focus: ESS2.D, ESS3.D, CCC1, CCC7, SEP

**Jay Holmes** ([jholmes@amnh.org](mailto:jholmes@amnh.org)), American Museum of Natural History, New York, NY

Use a free and simple graphing tool to explore United States weather and climate data through online graphing. Hundreds of years of data to quickly analyze and interpret. Visit [uanyc.site/wcp](http://uanyc.site/wcp) for more information.

**Meet Me in the Middle Session: Roundtable Conversations, Session A**

(Grades 5–9)

A411/412b, GWCC

Science Focus: GEN, NGSS

**Mary Lou Lipscomb** ([mlscience@aol.com](mailto:mlscience@aol.com)), NMLSTA Co-President, Naperville, IL

**Jacqueline Adkins** ([jadkins@jeffco.k12.co.us](mailto:jadkins@jeffco.k12.co.us)), Jeffco Public Schools, Golden, CO

**Stephanie Brunnett** ([sbrunnett@lab-aids.com](mailto:sbrunnett@lab-aids.com)), Lab-Aids, Inc., Ronkonkoma, NY

**Daniella Ellingson** ([daniellaellingson@gmail.com](mailto:daniellaellingson@gmail.com)), Harvard-Westlake Middle School, Los Angeles, CA

**Christine Herald** ([cherald76@gmail.com](mailto:cherald76@gmail.com)), Manhattan High School, Manhattan, KS

**Kris Irwin** ([kirwin@uga.edu](mailto:kirwin@uga.edu)) and **Jaclyn Stallard** ([jstallard@plt.org](mailto:jstallard@plt.org)), Project Learning Tree, Washington, DC

**Lauren Levites**, Lindblom Math and Science Academy, Chicago, IL

**Prisca Lewis** ([plewis@kindezi.org](mailto:plewis@kindezi.org)), The Kindezi School West, Atlanta, GA

**Cindy Lilly** ([clilly001@horrycountyschools.net](mailto:clilly001@horrycountyschools.net)), Ocean Bay Middle School, Myrtle Beach, SC

**Jeffrey Remington** ([jeff\\_remington@pasd.us](mailto:jeff_remington@pasd.us)), Palmyra Area Middle School, Palmyra, PA

**Denise Ryan**, Shape of Life, Soquel, CA

**Kelle Sumrall** ([kellesumrall@gmail.com](mailto:kellesumrall@gmail.com)), Lafayette Middle School, Oxford, MS

**William Sumrall** ([sumrall@olemiss.edu](mailto:sumrall@olemiss.edu)), The University of Mississippi, University, MS

Join middle level educators for small group conversations featuring scientific literacy, STEM/STEAM, NGSS, and much, much more. Choose a topic to discuss when you arrive.

**10:30 AM–12 Noon Meeting**

**Urban Science Education Advisory Board Meeting**

*Chestnut, Omni*

**10:30 AM–12:30 PM Meeting**

**AMSE General Membership Meeting**

(By Invitation Only)

*Pine (South Tower), Omni*

Please visit [amsek16.org](http://amsek16.org) for additional information.

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**11:00–11:30 AM Presentations****Meet Me in the Middle Session: Safety, the Route to Successful STEM Activities!***(Grades 5–8)**A311, GWCC*

Science Focus: GEN, SEP3

**Kenneth Roy** (@drroysafersci; [royk@glastonburyus.org](mailto:royk@glastonburyus.org)), Glastonbury (CT) Public Schools

Discussion centers on the critical safety piece in the “doing” of science and STEM activities.

**Meet Me in the Middle Session: Practical Lessons and Demonstrations on a Budget***(Grades 3–9)**A312, GWCC*

Science Focus: GEN, SEP

**Kathleen Brooks**, Retired Educator/Educational Consultant, Westbrook, CT**Patty Neumeister** (@mbescst; [neumeisterp@fultonschools.org](mailto:neumeisterp@fultonschools.org)), Medlock Bridge Elementary School, Alpharetta, GA**Rebecca Tonkinson** ([rtonkinson@crec.org](mailto:rtonkinson@crec.org)), Capitol Region Education Council, Hartford, CT

Ideas will be shared for demonstrating science concepts to middle level students (grades 3–9) using everyday lab equipment and additional inexpensive materials.

**Meet Me in the Middle Session: Roundtable Conversations, Session B***(Grades 5–9)**A411/412b, GWCC*

Science Focus: GEN, NGSS

**Mary Lou Lipscomb** ([mlscience@aol.com](mailto:mlscience@aol.com)), NMLSTA Co-President, Naperville, IL**Tony Bartley** ([abartley@lakeheadu.ca](mailto:abartley@lakeheadu.ca)), Lakehead University, Thunder Bay, ON, Canada**G. Michael Bowen** ([gmbowen@yahoo.com](mailto:gmbowen@yahoo.com)), Mount Saint Vincent University, Halifax, NS, Canada**Covey Denton** ([covey.denton@greenfieldschool.org](mailto:covey.denton@greenfieldschool.org)), Greenfield School, Wilson, NC**Amit Deutsch**, GOOGLE LLC, Mountain View, CA**Vickey Drew** ([vdrew@rvaschools.net](mailto:vdrew@rvaschools.net)), **Helena Easter** ([heaster@rvaschools.net](mailto:heaster@rvaschools.net)), and **Renee Simpkins** ([rsimpkin@rvaschools.net](mailto:rsimpkin@rvaschools.net)), Richmond (VA) Public Schools**Charles Fulco** ([saros61@gmail.com](mailto:saros61@gmail.com)), American Astronomical Association/NASA Solar System Ambassadors, Otis, MA**Jennifer Hammond** and **Emily Susko**, NOAA Teacher at Sea Program, Silver Spring, MD**Kris Irwin** ([kirwin@uga.edu](mailto:kirwin@uga.edu)) and **Jaclyn Stallard** ([jstallard@plt.org](mailto:jstallard@plt.org)), and Project Learning Tree, Washington, DC**Katherine Lewis** ([kewis@animalearn.org](mailto:kewis@animalearn.org)), Animalearn, Jenkintown, PA**Cindy Lilly** ([chilly001@horrycountyschools.net](mailto:chilly001@horrycountyschools.net)), Ocean Bay Middle School, Myrtle Beach, SC**Patty McGinnis** ([pattymcginnis1@gmail.com](mailto:pattymcginnis1@gmail.com)), Arcola Intermediate School, Eagleville, PA**Jeffrey Remington** ([jeff\\_remington@pasd.us](mailto:jeff_remington@pasd.us)), Palmyra Area Middle School, Palmyra, PA**Craig Richard** ([richardc@northandoverpublicschools.com](mailto:richardc@northandoverpublicschools.com)), North Andover Middle School, North Andover, MA**LaTonya Waller** ([lwaller2@rvaschools.net](mailto:lwaller2@rvaschools.net)), Thomas C. Boushall Middle School, Richmond, VA

Join middle level educators for small group conversations featuring scientific literacy, STEM/STEAM, NGSS, and much, much more. Choose a topic to discuss when you arrive.

**After an Earthquake: Real-Time Earthquake Data as a Hook to Encourage Answer-Seeking About the Geologic and Societal Context of the Event***(Grades 6–College)**A412a, GWCC*

Science Focus: ESS2.B, ESS3.B, CCC1, CCC2, SEP1, SEP4, SEP8

**Michael Hubenthal** ([michael.hubenthal@iris.edu](mailto:michael.hubenthal@iris.edu)), IRIS, Washington, DC

Help students explore earthquakes and Earth science in context after major earthquakes using a suite of free classroom products, data, animations, and visualizations from IRIS.

**“See” Through the Cultural Differences Influencing Student Learning***(Grades 9–12)**B211, GWCC*

Science Focus: GEN, NGSS

**Xiaoxin Lyu** ([x12502@tc.columbia.edu](mailto:x12502@tc.columbia.edu)), Teachers College, Columbia University, New York, NY

Discussion centers on similarities and differences among high school students’ scientific explanations across cultural boundaries. Factors influencing teaching diverse students will be analyzed.

**Reading and Using Data to Make Evidence-Based Claims***(Grades 9–12)**B212, GWCC*

Science Focus: GEN, SEP

**Amy Chilinguerian** (@achiliteach; [achilinguerian@bcps.org](mailto:achilinguerian@bcps.org)), Loch Raven High School, Towson, MD

Using data in the classroom can enhance your lessons and provide your students with opportunities to engage in argument from evidence.

**Not So Hidden Figures: Increasing Student STEM-ulation**

(Grades 6–12)

C204, GWCC

Science Focus: GEN

**LaTonya Bolden** ([boldens@fultonschools.org](mailto:boldens@fultonschools.org)), Tri-Cities High School, Atlanta, GA

Discover strategies to engage underrepresented students in advanced placement science courses and create culturally relevant classrooms that promote student achievement.

**Teaching Engineering Design Through STEM to Girls in Underserved School Districts: Increasing the Science Self-Efficacy of Elementary School Girls**

(Grades 3–5/College)

International Ballroom D, Omni

Science Focus: ETS1, SEP

**Amy Catalano** ([amy.catalano@hofstra.edu](mailto:amy.catalano@hofstra.edu)), Hofstra University, Hempstead, NY

Review findings from a research project examining the science self-efficacy of 80 girls, grades 3–5, from underserved school districts engaged in learning engineering design through STEM.

**Engineering in the Learning Cycle: Using the 5E Model to Teach Science-Focused STEM in Elementary**

(Grades P–5/College)

Juniper, Omni

Science Focus: ETS

**Jeni Davis** ([jrdavis@salisbury.edu](mailto:jrdavis@salisbury.edu)), Salisbury University, Salisbury, MD

**Michele Wiehagen** ([@upbeateducation](mailto:@upbeateducation); [michele.wiehagen@sdhc.k12.fl.us](mailto:michele.wiehagen@sdhc.k12.fl.us)), Hillsborough County Public Schools, Tampa, FL

Elementary teachers—come see how engineering design challenges can be incorporated into a science-focused lesson plan using the 5E (Engage, Explore, Explain, Elaborate, and Evaluate) model.

**11:00 AM–12 Noon Featured Presentation**



**Science Is to STEM as Coffee Is to Starbucks: Real-World, Relevant, and Grounds for the Perfect Integration**

(General)

B309, GWCC

Science Focus: GEN

*Sponsored by Shell*



**Jo Anne Vasquez** ([@stemlessons](mailto:@stemlessons); [jvasquez@stemlessonessentials.com](mailto:jvasquez@stemlessonessentials.com)), 1996–1997 NSTA President, and STEM Education Consultant and Professional Learning Provider, Rocks to Rainbows, LLC, Gilbert, AZ

Presider: Sally Creel, Strand Leader, NSTA Atlanta National Conference, and Cobb County Schools, Marietta, GA

Science provides the main “ingredient” to help students learn about the world around them—to answer questions, solve problems, and construct explanations. Science is the anchor for developing interdisciplinary STEM instruction. Let’s explore together how easy it is to use science as the main ingredient in the STEM instructional recipe.

*A noted author, Jo Anne Vasquez brims with energy and passion for science and STEM education. She was a presidential appointee to the National Science Board, with the distinction of being the first and only K–12 educator elected to the governing board of the National Science Foundation. A former NSTA president, she also received NSTA’s highest honor—the Robert H. Carlton Award for Leadership in Science Education in 2006. Other accolades include Arizona’s Outstanding Educator of the Year and the National Environmental Association’s Teacher of the Year.*

*Jo Anne has been a classroom teacher, district science specialist for Mesa Public Schools, adjunct professor of science education at Arizona State University, and director of professional development and outreach at ASU’s Center for Research on Education in Science, Mathematics, Engineering and Technology (CRESMET). In addition, she has held positions as vice president and program director at the Helios Education Foundation. Currently, she is a STEM education consultant.*

**11:00 AM–12 Noon Presentations****Transforming Your Classroom Through Meaningful Technology Integration***(Grades K–8)**A301, GWCC*

Science Focus: GEN, SEP8

**Jennifer O'Sullivan** (@suntansnplans; [j david18@fau.edu](mailto:j david18@fau.edu)), **Suzette Milu** ([smilu@fau.edu](mailto:smilu@fau.edu)), and **Cara Pavsek** (@carapavsek; @mrspavsek; [cpavsek@fau.edu](mailto:cpavsek@fau.edu)), A.D. Henderson University School, Boca Raton, FL

Discover ways to use green screen technology, augmented reality, digital portfolios, web-based assessment tools, and more to transform your science classroom.

**CESI-Sponsored Session: Using Interactive Technologies in the Classroom***(Grades 3–College)**A303, GWCC*

Science Focus: GEN, SEP8

**Jason Artero**, Central Michigan University, Mount Pleasant

**Jim McDonald** (@jimscienceguy; [jim.mcdonald@cmich.edu](mailto:jim.mcdonald@cmich.edu)), CESI President, and Central Michigan University, Mount Pleasant

We will showcase a variety of Web 2.0 tools and websites that will assist you in science teaching and learning. Join us to explore a variety of tools with your laptops, smartphones, and tablets.

**Do You Need a New Science Lab? Win \$20K!***(Grades K–12)**A304, GWCC*

Science Focus: GEN

**Amanda Upton**, Senior Manager, Award and Nomination Program and Competitions, NSTA, Arlington, VA

Win a Shell Science Lab Makeover (\$20,000 value) for your school. Are you a middle school or high school science teacher in need of a science lab makeover? Come find out how you can apply to win the Shell Science Lab Challenge! You will have an opportunity to actually begin to complete the application and have questions answered. The Regional Challenge is a new program that includes K–12 teachers in specific areas where Shell has operations in the U.S.

**Evolution of an Elementary Science Lab to an Innovative STEM Lab***(Grades K–5)**A401, GWCC*

Science Focus: GEN, SEP

**Colleen Cauffiel** (@colleencauffiel; [colleen.cauffiel@cobbk12.org](mailto:colleen.cauffiel@cobbk12.org)), Ford Elementary School, Acworth, GA

Are you interested in starting a STEM Lab at your elementary school, but you aren't sure where to start? Get guidance on the steps of planning the curriculum and managing learning materials and multiple grade levels.

**Using STEM to Bring Parents and Projects into Title I Schools***(Grades K–5)**A408, GWCC*

Science Focus: GEN

**Rachel Fiore** ([r fiore1@gsu.edu](mailto:r fiore1@gsu.edu)), Georgia State University, Atlanta

**Karelle Williams** ([karelle.williams@tmsa.org](mailto:karelle.williams@tmsa.org)), The Main Street Academy, Atlanta, GA

**Sonya Floyd** ([floyds1@fultonschools.org](mailto:floyds1@fultonschools.org)), A. Philip Randolph Elementary School, Atlanta, GA

Want parents competing to volunteer in your classroom? Want amazing project-based lessons? STEM can thrive in all schools!

**3D How to Transition to 3-D Standards-Based Grading***(Grades 9–12)**B401, GWCC*

Science Focus: GEN, CCC

**Borislav Bilash** (@borislavbilash; [bbilash@pascack.org](mailto:bbilash@pascack.org)), Pascack Valley High School, Hillsdale, NJ

**Elise Burns** (@efb68; [eburns@pascack.org](mailto:eburns@pascack.org)), Pascack Hills High School, Montvale, NJ

We will share two approaches describing how to transform traditional grading into three-dimensional standard-based grading from the ground up.

**Developing a Culturally Relevant Engineering Curriculum***(Grades 5–12)**B402, GWCC*

Science Focus: ETS1, SEP1, SEP6

**Hillary Paul Metcalf** ([hillarymetcalf@gmail.com](mailto:hillarymetcalf@gmail.com)), Chelsea High School, Chelsea, MA

Join me for a journey through developing a culturally relevant engineering curriculum for an urban school. I'll also share my resources to help you develop your own!

### Developing an NGSS-Focused Biology Curriculum for Your District

(Grades 9–12)

C202, GWCC

Science Focus: LS, CCC, SEP

**Hillary Gawne** ([hillary.gawne@pgcps.org](mailto:hillary.gawne@pgcps.org)), Laurel High School, Laurel, MD

**Terri Dove** ([terri.dove@pgcps.org](mailto:terri.dove@pgcps.org)), Dr. Henry A. Wise, Jr. High School, Upper Marlboro, MD

**Lorrie Armfield** ([@Professorkool2](mailto:@Professorkool2); [lorrie.armfield@pgcps.org](mailto:lorrie.armfield@pgcps.org)), Prince George's County Public Schools, Upper Marlboro, MD

Come learn how teachers from our school district came together to develop a yearlong NGSS-focused biology curriculum. You'll hear about our goals and challenges, and how we wrote a curriculum to address the needs of diverse learners in a large school district.

### Visual Literacy Strategies and Formative Assessments...for All!

(Grades 6–12)

C207, GWCC

Science Focus: GEN, CCC1, CCC3, SEP2, SEP4, SEP7, SEP8

**Brittany Beck** ([@brittanbeck](mailto:@brittanbeck); [brittnbeck@gmail.com](mailto:brittnbeck@gmail.com)),

**Barbara Spanos** ([@Barbie\\_Rizz](mailto:@Barbie_Rizz); [barbspanos@gmail.com](mailto:barbspanos@gmail.com)), **Yanique Sears** ([ysears@hstat.org](mailto:ysears@hstat.org)), and **Constance Giannakakis**, High School of Telecommunication Arts and Technology, Brooklyn, NY

We will discuss strategies and best practices regarding how to use visuals, models, and formative assessments to supplement or replace traditional text-based lessons.

### Forensics: Closing the Case

(Grades 9–12)

C210, GWCC

Science Focus: GEN, SEP2, SEP3, SEP7

**Kristie Cannon** ([kcannon@hoover.k12.al.us](mailto:kcannon@hoover.k12.al.us)), Spain Park High School, Birmingham, AL

A culminating crime scene activity to test your students' ability to crack the case while evaluating their learning through a DIY project-based assessment.

## NSTA Community Hub

Be sure to stop by the NSTA Community Hub today between 9:00 AM and 5:00 PM. It's located in the Exhibit Hall at Booth #1909. Meet up with your peers in our Networking Lounge and exchange teaching ideas or session notes. Come see what NSTA has to offer! See Vol. 1, page 15 for more details.

### Supporting 3-D Learning Through the Design of Model-Based Inquiry Units: A New Template to Support Science Teachers

(Grades 6–12)

C213, GWCC

Science Focus: GEN, NGSS

**Ron Gray** ([@grayron](mailto:@grayron); [gray.ron@gmail.com](mailto:gray.ron@gmail.com)), Northern Arizona University, Flagstaff

**Todd Campbell** ([@dtcampbe](mailto:@dtcampbe); [todd.campbell@uconn.edu](mailto:todd.campbell@uconn.edu)), University of Connecticut, Storrs Mansfield

**Thomas McKenna** ([@tjscience](mailto:@tjscience); [tjmckenna01@gmail.com](mailto:tjmckenna01@gmail.com)), Connecticut Science Center, Hartford

We will introduce a new template to help science teachers plan for three-dimensional learning through the design of model-based inquiry units. Example units will be provided.

### Hot Stuff: Empowering Student Action for Earth

(Grades 4–12)

Birch, Omni

Science Focus: ESS3.C, ESS3.D, LS2.A, LS4, CCC1, CCC5, SEP1, SEP3, SEP8

**Richard Frazier** ([richard\\_frazier@hotmail.com](mailto:richard_frazier@hotmail.com), [rfrazier@aes.ac.in](mailto:rfrazier@aes.ac.in)), American Embassy School–New Delhi, India,

**Kate Thome** ([kgthome@gmail.com](mailto:kgthome@gmail.com), [mthome@carrollton.org](mailto:mthome@carrollton.org)), Carrollton School of the Sacred Heart, Miami, FL

Students are facing a bewildering world of gloomy temperature and rainfall data. Use schoolyard science to empower them to care and act.

### Using Authentic Video Resources to Enhance the Implementation of the NGSS

(Grades 6–College)

Dogwood A, Omni

Science Focus: GEN, SEP

**Heather Johnson** ([@tchscience](mailto:@tchscience); [heather.j.johnson@vanderbilt.edu](mailto:heather.j.johnson@vanderbilt.edu)), Vanderbilt University Peabody College, Nashville, TN

**Dat Le** ([dat.le@apsva.us](mailto:dat.le@apsva.us)), Arlington (VA) Public Schools

Explore real cases of how National Board–certified teachers successfully implement the NGSS in their classroom instruction. BYOD.

### How Do We Make NGSS Storylines Work by Pushing Students to Go Deeper?

(Grades P–12)

Grand Ballroom C, Omni

Science Focus: GEN, NGSS

**Brian Reiser** ([@reiserbrianj](mailto:@reiserbrianj); [reiser@northwestern.edu](mailto:reiser@northwestern.edu)) and

**Michael Novak** ([@mnovakccl](mailto:@mnovakccl); [mnovakccl@gmail.com](mailto:mnovakccl@gmail.com)), Northwestern University, Evanston, IL

Explore how helping students become dissatisfied with their explanatory models is a key part of making NGSS storylines work in classrooms.

**SCST-Sponsored Session: OUSTA Winner Presentation: What Types of People Do Science? Investigating Curricular Materials That Highlight Scientist Diversity While Covering Course Content**

(College)

Hickory, Omni

Science Focus: GEN

**Jeff Schinske** ([schinskejeff@fhda.edu](mailto:schinskejeff@fhda.edu)), Foothill College, Los Altos, CA

Join the OUSTA winner as he presents Scientist Spotlights, homework assignments that introduce course content while featuring counter-stereotypical scientists. Analyses suggest Spotlights diversify students' perceptions of scientists and support student success.

**Science Leaders Roundtable**

(General)

International Ballroom C, Omni

Science Focus: GEN

**John Olson** (@JohnCasperOlson; [john.c.olson@state.mn.us](mailto:john.c.olson@state.mn.us)), NSTA Director, Coordination and Supervision of Science Teaching, and Minnesota Dept. of Education, Roseville  
Share ideas and concerns for leadership at the state, district, and school level with members of the NSTA Coordination and Supervision Committee. Topics may include leadership teams, elementary curricula, safety, resource vetting, messaging, and professional development.

**NSELA-Sponsored Session: The Delaware NGSS Teacher Leader Program**

(General)

Magnolia, Omni

Science Focus: GEN, NGSS

**Edward McGrath** (@eddiesciguy; [edward.mcgrath@redclay.k12.de.us](mailto:edward.mcgrath@redclay.k12.de.us)), Red Clay Consolidated School District, Wilmington, DE

Hear about a journey of implementation of NGSS in Delaware led by teachers to develop three-dimensional curricula, assessment, and professional learning in K–12 science for all students.

**Meaningful Notebooking!**

(Grades 3–10)

Maple A/B, South Tower, Omni

Science Focus: GEN

**Darren Wells**, Boston (MA) Public Schools

Get introduced to a variety of notebooking techniques that will make student thinking visible and increase engagement and excitement for learning in ALL students. Students will take pride in their notebooks and, therefore, increase the level of effort they put into their work.

**Reflections on Teaching Baltimore City Science**

(Grades 6–College)

Walnut, Omni

Science Focus: LS, INF

**Nicole Veltre-Luton** (@APBiologyDHHS; [nveltre@bcps.k12.md.us](mailto:nveltre@bcps.k12.md.us)), Baltimore (MD) City Public Schools

A 20+ year veteran Baltimore City Public Schools science teacher will reflect on the importance of equity in science education and what this can look like in both the indoor and outdoor classroom.





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

### Global Watershed Project: Water Chemistry and Restoration

(Grades 7–12)

A305, GWCC

Science Focus: ESS2.C

**Heather Wygant** ([geofaultline@gmail.com](mailto:geofaultline@gmail.com)), Santa Clara District Resource Center, Sunnyvale, CA

**Susan Paulsen** ([susanpaulsen@yahoo.com](mailto:susanpaulsen@yahoo.com)), Live Oak High School, Morgan Hill, CA

**Yujiro Fujiwara** ([yfujiwara@caj.or.jp](mailto:yfujiwara@caj.or.jp)), Christian Academy in Japan, Tokyo

We will share a global collaborative project for students in secondary schools that seeks to collect data from water sources (e.g., lakes, rivers) in different parts of the world. By seeing global and local changes, we will look for ways to protect one of our most precious resources.

### Contraptions and Confidence: Transforming Science Learning with Engineering Design

(Grades 1–3)

A402, GWCC

Science Focus: ETS1, PS2, SEP

**Christine McGrail** ([cmcgrail@umass.edu](mailto:cmcgrail@umass.edu)), University of Massachusetts, Amherst

Integrate engineering design to transform science learning, allowing students to see themselves as knowledgeable and successful in science as they collaborate and share intellectual resources.

### Linking Science and Literacy for Improved Student Outcomes

(Grades K–8)

A403, GWCC

Science Focus: GEN

**Bill Badders** ([@baddersb](mailto:@baddersb); [baddersb@roadrunner.com](mailto:baddersb@roadrunner.com)), 2013–2014 NSTA President, Cleveland Heights, OH

Come explore strategies for linking science and literacy that support students' abilities to read, write, and discuss in the context of science and inquiry-based learning using fiction and nonfiction texts. Hands-on examples of how science supports literacy and literacy supports science will be used.

### Elementary Students Doing Science! NGSS and CCSS: Perfect Together

(Grades 3–5)

A404, GWCC

Science Focus: GEN

**Allyson Nusser** ([anusser@amnh.org](mailto:anusser@amnh.org)), American Museum of Natural History, New York, NY

Discover how to leverage literacy practices to strengthen students' capacities to construct scientific explanations. Using interactive read-alouds, graphic organizers, and writing scaffolds

enables your students to build scientific explanations based on quantitative data and textual evidence.

### Mission to Mars STEAM Camp

(Grades 3–5)

A405, GWCC

Science Focus: ETS1

**Lori Nelson** ([lori.nelson@hsv-k12.org](mailto:lori.nelson@hsv-k12.org)), Chaffee Elementary School, Huntsville, AL

Blast off with us for the Mission to Mars STEAM Camp, the engineering summer camp curriculum we developed, which blends engineering challenges, literacy, and the arts to teach the engineering design process.

### Using Lab Notebooks in the Preschool and Elementary Classroom

(Grades P–6)

A410, GWCC

Science Focus: GEN, SEP8

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

Come learn how to teach data collection, analysis, and recording for preschool and elementary-age children. Take away tools to design and implement lab notebooks in your classroom.



### NGSS@NSTA Forum Session: A Model-Based Educational Resource for High School Biology

(Grades K–12)

B102, GWCC

Science Focus: LS, SEP

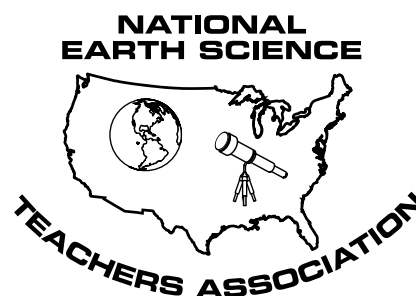
**Rich Hedman** ([hedmanrd@csus.edu](mailto:hedmanrd@csus.edu)), California State University, Sacramento

**Candice Guy-Gaytán** ([@GuyCandice](mailto:@GuyCandice); [cgaytan@unr.edu](mailto:cgaytan@unr.edu)), University of Nevada, Reno

President: Ted Willard ([twillard@nsta.org](mailto:twillard@nsta.org)), Assistant Executive Director, Science Standards, NSTA, Arlington, VA

Join us for an activity that will illustrate the design and structure of the Model-Based Educational Resource-Biology (MBER-Bio). MBER-Bio is a web-based, open-source curriculum package that supports teachers in implementing a full year of high school biology by engaging students in three-dimensional learning. It is based on a modeling approach that provides an anchor for the full suite of science and engineering practices as students work as a community to explain biological phenomena.

# National Earth Science Teachers Association Events at the 2018 NSTA National Conference in Atlanta



*We have a number of exciting sessions! To find our sessions, enter **NESTA** as the keyword when searching events online at NSTA's session browser for the conference. On Friday, March 16 and Saturday, March 17, we have a series of sessions all in **B103** of the Georgia World Congress Center. Don't miss out on our Share-a-Thons and the events below!*

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

## Friday, March 16

2:00 – 3:00 p.m. **American Geophysical Union (AGU) Lecture: Chasing Coral Bleaching: A Present and Growing Ecological Disaster: Dr. C. Mark Eakin**



*Coral reefs are amazingly beautiful and complex ecosystems that support at least a quarter of all marine species. However, as ocean temperatures rise, corals have been expelling the algae that give them their color and their food, causing them to die around the world at a record rate. This talk describes this growing problem and its haunting future while attempting to leave you hopeful that we still can save coral reefs before they are all gone.*

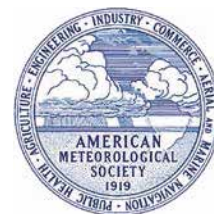
**Sidney Marcus Auditorium, Georgia World Congress Center**

## Saturday, March 17

5:00 – 6:00 p.m. **NESTA's exciting Rock, Mineral, and Fossil Raffle!**  
**Georgia World Congress Center, B103**

6:30 – 8:00 p.m. **NESTA Friends of Earth Science Reception**  
**International Ballroom F, Omni Atlanta at CNN Center**

***NESTA gratefully acknowledges the following organizations as sponsors:***



**INF NESTA and NOAA Share: NOAA Planet Stewards—Content, Collaboration, and Action**

(General)

B103, GWCC

Science Focus: ESS3.C, INF

**Peggy Steffen** and **Bruce Moravchik** ([bruce.moravchik@noaa.gov](mailto:bruce.moravchik@noaa.gov)), NOAA National Ocean Service, Silver Spring, MD  
**Molly Harrison** ([molly.harrison@noaa.gov](mailto:molly.harrison@noaa.gov)), NOAA Fisheries, Silver Spring, MD

Find out about professional development opportunities, online tools, and stewardship grants for educators to build scientifically literate individuals and communities prepared to respond to the challenges of environmental threats monitored by NOAA. Try your hand with the Futures Wheel activity and receive free resources.

 **NSTA Press® Session: The Power of Assessing: Guiding Powerful Practices**

(Grades K–5)

B405, GWCC

Science Focus: GEN, NGSS

**Lisa Nyberg** ([@docnyberg](mailto:@docnyberg); [lnyberg@csufresno.edu](mailto:lnyberg@csufresno.edu)), California State University, Fresno

**Julie McGough** ([@jvmcgough1](mailto:@jvmcgough1); [mrmagoojulie2@att.net](mailto:mrmagoojulie2@att.net)), Valley Oak Elementary School, Fresno, CA

Assessments can be fun! How do you build meaningful, authentic assessments to engage all of your students? Join our investigation and see!

**Big Science: Using Large-Scale Genomics Projects in the Biology Classroom**

(Grades 9–12)

C201, GWCC

Science Focus: LS3

**Neil Lamb** ([@neillamb](mailto:@neillamb)) and **Jennifer Carden** ([@JWhitneyCarden](mailto:@JWhitneyCarden)), HudsonAlpha Institute for Biotechnology, Huntsville, AL

Explore using HudsonAlpha's (free) Progress of Science Timeline. Students investigate how projects such as ENCODE, HapMap, and the 1000 Genome Project have dramatically reshaped our thinking about the impacts of DNA changes.

**Unpacking Sources of Variation in Ecological Data**

(Grades 6–College)

C203, GWCC

Science Focus: LS2, LS4, SEP4, SEP5

**Michelle Forsythe** ([mforsythe@txstate.edu](mailto:mforsythe@txstate.edu)), Texas State University, San Marcos

Explore how to support students in informal, but sophisticated reasoning about how measurement error, natural variation, and causal factors contribute to differences in ecological data.

**Using Local and National Climate Data to Support Student Understanding of Climate Change**

(Grades 6–College)

C205, GWCC

Science Focus: ESS2.D, ESS3.D, CCC1, CCC2, CCC7, SEP1, SEP4, SEP5, SEP6, SEP7

**Sarah Fick** ([@SarahJFick](mailto:@SarahJFick); [ficksj@wfu.edu](mailto:ficksj@wfu.edu)), Wake Forest University, Winston-Salem, NC

**Anna Maria Arias** ([aarias588@gmail.com](mailto:aarias588@gmail.com)), Illinois State University, Normal

**Jonathan Baek** ([@jonbaekteach](mailto:@jonbaekteach); [jbaek@hc.wash.k12.mi.us](mailto:jbaek@hc.wash.k12.mi.us)), Honey Creek Community School, Ann Arbor, MI

Using data from NOAA, this workshop focuses on pre-cleaned and analyzed datasets for students to analyze and use as evidence for claims about climate change.

**iPads to Support Literacy in Science**

(Grades P–12)

C206, GWCC

Science Focus: GEN, SEP

**Rhonda Dye** ([@REDye2013](mailto:@REDye2013); [rhonda.dye@cobbk12.org](mailto:rhonda.dye@cobbk12.org)), Cobb County School District, Marietta, GA

Discover how using productivity apps can provide students with opportunities to share their scientific thoughts and processes in a variety of formats.

**Developing Science Practices: Constructing Explanations and Engaging in Argumentation**

(Grades 5–9)

C209, GWCC

Science Focus: LS2, CCC1, CCC2, CCC5, CCC7, SEP6, SEP7

**Dora Kastel** ([@Dora\\_Kastel](mailto:@Dora_Kastel); [kastel.dora@gmail.com](mailto:kastel.dora@gmail.com)), New Visions for Public Schools, New York, NY

**Maia Binding** ([@SEPUP\\_UCB](mailto:@SEPUP_UCB); [mbinding@berkeley.edu](mailto:mbinding@berkeley.edu)), The Lawrence Hall of Science, University of California, Berkeley

Learn how to use scaffolding tools to help students construct NGSS-focused explanations and engage in argument from scientific evidence.

**DiscoverE's Future City Program: A Project-Based STEM Experience**

(Grades 6–8)

C211, GWCC

Science Focus: ETS, CCC2, CCC3, CCC7, SEP

**John Hutchens** ([johnh@usca.edu](mailto:johnh@usca.edu)), Ruth Patrick Science Education Center, Aiken, SC

Discover how this project-based experience can help your students understand the engineering design process and project management. Give your students a real-world experience of doing what an engineer does.

### Engineering Prosthetic Hands: Integrating Anatomy into the Middle School Classroom

(Grades 6–8) C212, GWCC

Science Focus: ETS1, LS, CCC4, CCC6, SEP1, SEP7

**Alex Gerber** (@agerbs2; alexgerb@iu.edu), Indiana University Bloomington

We will engage in constructing a prosthetic hand to understand how to relate science content with engineering design.

### Measuring Mastery in 3-D: A Tale of Two Districts' Integration of Standards-Based Grading and the NGSS

(Grades K–12) Cottonwood A/B, Omni

Science Focus: GEN, NGSS

**Kelly Jones** (kelly.jones@rentonschools.us), Renton School District, Newcastle, WA

**Megan Walker** (mewalker@fwps.org), Federal Way (WA) Public Schools

We will present the approaches taken by two different urban school districts to integrate the NGSS with their districtwide standards-based grading systems.

### Sounding Off: 3-D Learning in Enhanced 5E Lessons

(General) Dogwood B, Omni

Science Focus: PS4.A

**Frank Giuliano** (fgiuliano@westfield.ma.edu), Westfield State University, Westfield, MA

Experience a unique approach to integrating the three dimensions of the NGSS into inquiry-based science lessons while simultaneously addressing science misconceptions.

### Connecting the Science and Engineering Practices and Informational Text

(Grades 5–College) Grand Ballroom A, Omni

Science Focus: GEN, SEP

**Susan Gran** (sgran@lsc.k12.in.us), Lafayette (IN) School Corporation

Trying to incorporate the text into your lab investigations? This strategy does the trick...practice here and add it to your literacy strategy library next week!

### NARST-Sponsored Session: Participatory Action Research Using Annotated Videos to Promote Reflective STEM Practice Presented at NARST 90th Annual International Conference

(General) Spruce, South Tower, Omni

Science Focus: GEN, NGSS

**Gloria Hardrict-Ewing** (@hardrictewing; gjhewing@sbcglobal.net), University of Missouri–St. Louis

Review findings from a study as well as model participatory action research using instructional videos with a rubric to establish baselines for scoring instructional STEM strategies.

### 11:00 AM–12 Noon Exhibitor Workshops Incorporating the NGSS Crosscutting Concepts into Your Teaching

(Grades 3–12) B216, GWCC

Science Focus: GEN, CCC

Sponsor: Pearson Learning Services

**Michael Wyession**, Washington University in St. Louis

Join Michael Wyession, an NGSS lead writer, as he discusses ways that teaching can meet best practices concerning the NGSS crosscutting concepts. Often considered the most challenging of the three dimensions, they require increased coordination across and within grades. But if implemented well, crosscutting concepts can form the basis of storylines that provide students with a deep and intuitive understanding of science.

### Using Argumentation for Discussing Phenomena and Increasing Student Voice About STEM

(Grades K–12) B301, GWCC

Science Focus: GEN, SEP7

Sponsor: STEMscopes

**Sharry Whitney** (swhitney@acceleratelearning.com), STEMscopes, Houston, TX

Reduce teacher talk and increase purposeful student talk as we model consensus building through argumentation around intriguing science phenomena that matter. ELA skills and the 21st-century skills of communication and collaboration are a must in the STEM classroom!

**Stoichiometry: Tools and Strategies That Make It Easier to Teach**

(Grades 9–12)

B315, GWCC

Science Focus: PS1.A, PS1.B, CCC1, CCC3, SEP4, SEP5

Sponsor: PASCO scientific

**Jason Lee**, East Georgia State College—Statesboro

How can you tell when a reaction is complete? Why doesn't more reactant always lead to more product? Help students develop a better understanding of mole ratios, stoichiometry, and limiting reactants through this hands-on activity using household chemicals and a Wireless Pressure Sensor.

**Enlighten Your Optics, Color, and Light Unit**

(Grades 7–12)

B316, GWCC

Science Focus: ETS, PS, CCC1, CCC2, CCC3, CCC6, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8

Sponsor: PASCO scientific

**Tom Hsu**, PASCO scientific, Roseville, CA

Get hands-on with optics to support your physics curriculum! We will cover properties of light, ray tracing, refraction, and digital images.

**11:30 AM–12 Noon Presentations**



**Law and Order in the High School Chemistry Classroom: Using a Mock Trial to Discuss Scientific Concepts and Ethics**

(Grades 9–College)

B212, GWCC

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

**Karen Flummerfelt** ([karen.flummerfelt@lausd.net](mailto:karen.flummerfelt@lausd.net)), Downtown Magnets High School, Los Angeles, CA

Using critical thinking and literacy skills, students learn that scientific ethics can be complicated when they put a historical scientist “on trial” for his or her discoveries.

**Breaking Barriers: Engaging Girls in STEM Fields Using Role Models and Student-Created Media**

(Grades 9–12)

C204, GWCC

Science Focus: GEN, SEP

**Rita Karl** ([@SciGirls](mailto:@SciGirls); [rkarl@tpt.org](mailto:rkarl@tpt.org)) and **Alicia Santiago** ([santimiller@mac.com](mailto:santimiller@mac.com)), Twin Cities Public Television, St. Paul, MN

**Brenda Britsch** ([bbritsch@ngcproject.org](mailto:bbritsch@ngcproject.org)), National Girls Collaborative Project, Saint Paul, MN

Find out how to integrate STEM role models, role model videos, and student-created media to counter stereotypes and engage girls in traditionally male fields.

**Catch the Wave Using the 5E-IA Lesson Model**

(Grades 9–12)

C301, GWCC

Science Focus: PS4.A, PS4.B, PS4.C, CCC2, SEP4, SEP5, SEP7, SEP8

**Gretta Kilgore** ([@grettakilgore](mailto:@grettakilgore); [gretta.kilgore@lcsk12.org](mailto:gretta.kilgore@lcsk12.org)) and **Shane Carpenter** ([@sshcarpenter](mailto:@sshcarpenter); [shane.carpenter@lcsk12.org](mailto:shane.carpenter@lcsk12.org)), Clements High School, Athens, AL

**Michele Brazeal**, Elkmont High School, Elkmont, AL  
Come learn about a 5E-IA Lesson (developed by an Alabama Science In Motion Professional Learning Group) that investigates waves and their application for information transfer.

**Girls in Engineering, Mathematics and Science (GEMS): University and School Collaborative**

(Grades 4–8/College)

International Ballroom D, Omni

Science Focus: GEN, SEP

**Patricia Paulson** ([@Pattipaulson1](mailto:@Pattipaulson1); [patricia-paulson@bethel.edu](mailto:patricia-paulson@bethel.edu)), Bethel University, Saint Paul, MN

**Justine Boecker** ([@jboecker17](mailto:@jboecker17); [justine.boecker@fridley.k12.mn.us](mailto:justine.boecker@fridley.k12.mn.us)), Fridley High School, Minneapolis, MN

Find out how a collaborative between a university and local elementary schools brings grade 5 girls to a daylong experience with STEM.

**Guidelines for Transforming the Science Classroom into the STEM Classroom**

(Grades K–12)

Juniper, Omni

Science Focus: ETS, SEP

**Anthony DeStef** ([adestef22@gmail.com](mailto:adestef22@gmail.com)) and **Mary Pearce** ([marypearce999@gmail.com](mailto:marypearce999@gmail.com)), H.W. Mountz Elementary School, Spring Lake, NJ

By following these guidelines, one can facilitate explorative learning without reinventing the wheel. Transform old lessons into next generation STEM activities. Examples will be provided.

**12 Noon–12:30 PM Meeting**

**NMLSTA Membership and Board Meeting**

(By Invitation Only)

A314, GWCC

All NMLSTA members are invited to attend this Board Meeting. Meet the officers and board members and learn how you can become more involved with NMLSTA.



**12 Noon–1:30 PM Exhibitor Workshops****Shifting to the Five Innovations: Density Phenomena***(Grades 6–8)**B201, GWCC*

Science Focus: PS

Sponsor: Carolina Biological Supply Co.

**Carolina Teaching Partner**

Experience the five innovations firsthand from the Smithsonian's middle school chemistry unit. Through three-dimensional lessons, the misconceptions about density can be cleared up. Leave with a better understanding of how the innovations enhance the teaching of science with learning progressions, making sense of phenomena, and designing solutions.

**Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher***(Grades 6–12)**B202, GWCC*

Science Focus: PS

Sponsor: Carolina Biological Supply Co.

**Carolina Teaching Partner**

Looking for lab activities that work every time, not just periodically? Explore easy, engaging, and safe chemistry activities that will produce a reaction in your students. Whether you're new to chemistry or feeling out of your element, you will learn new ways to create excitement with hands-on labs, demonstrations, and digital content.

**Dynamic Demonstrations from Flinn Scientific***(Grades 7–College)**B203, GWCC*

Science Focus: PS

Sponsor: Flinn Scientific, Inc.

**Alan Downward** ([adownward@flinnsci.com](mailto:adownward@flinnsci.com)) and **Megan Leifker** ([mleifker@flinnsci.com](mailto:mleifker@flinnsci.com)), Flinn Scientific, Inc., Batavia, IL

Seeing is believing! Flinn Scientific presents a variety of easy-to-perform and exciting chemistry and physical science demonstrations. Come see Flinn's new demonstrations and some of your old favorites—all guaranteed to make your science classroom come alive. Handouts for all demonstrations. Visit [www.flinnsci.com](http://www.flinnsci.com) for more information.

**They Come in Pairs: Addressing Student Misconceptions About Chromosomes***(Grades 6–12)**B204, GWCC*

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

**Carolina Teaching Partner**

Understanding the stages of meiosis and clarifying chromosome behavior has always been a challenge for students.

What if those concepts were as easy to understand as folding laundry? Get help identifying and addressing student misconceptions by using ChromoSocks®. Presented in partnership with HudsonAlpha.

**Biology with Vernier Using Chromebook***(Grades 7–College)**B207, GWCC*

Science Focus: ETS2, LS1, LS2

Sponsor: Vernier Software &amp; Technology

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

Participate in fun and engaging hands-on experiments using Vernier digital tools with Chromebooks to investigate cellular respiration, enzyme activity, and the spectral analysis of chlorophyll. See how sensor-based experiments teach students about data collection and analysis—practices that promote science inquiry, improve science literacy, and boost test scores.

**Inquiry Physics Experiments from Vernier—No Lab Setup Required!***(Grades 9–12)**B208, GWCC*

Science Focus: ETS2, PS

Sponsor: Vernier Software &amp; Technology

**Verle Walters** ([info@vernier.com](mailto:info@vernier.com)), Vernier Software & Technology, Beaverton, OR

Come to this hands-on workshop to see how a collection of high-quality videos with embedded measurement tools can be used to expand inquiry opportunities in introductory physics. Investigate topics such as mechanical energy transformation and Coulomb's law using customizable activities from our new Pivot Interactives online, web-based service.

**Integrating Crosscutting Concepts into Your Classroom***(Grades K–8)**B209, GWCC*

Science Focus: GEN, CCC

Sponsor: TCI

**Christy Sanders**, TCI, Mountain View, CA

Join TCI and participate in an engaging Bring Science Alive! investigation that has your students linking the different domains of science. Participants will experience this lesson from the students' perspective as they observe patterns, cause and effect, and other crosscutting concepts to enrich their application of practices and their understanding of core ideas.

### STEM Bins®: Engineering Through Play

(Grades K–2)

B213, GWCC

Science Focus: ETS, SEP

Sponsor: ETA hand2mind

**Brooke Brown**, Roosevelt Elementary School, Norman, OK

Discover how to effectively use STEM Bins as a foundational, developmentally appropriate form of engineering for elementary students. Learn simple ways to implement STEM Bins for early finishers, enrichment, morning work, centers, makerspaces, and literacy and math extensions. Get your hands on the materials and try STEM Bins for yourself!

### Conservation Research Through Academic Partnerships: Discovering New Species with Students

(Grades 9–College)

B214, GWCC

Science Focus: LS

Sponsor: Operation Wallacea

**Scott Sveiven** ([scott.sveiven@opwall.com](mailto:scott.sveiven@opwall.com)), Operation Wallacea, Staunton, VA

As scientists, we recognize the importance of field work. Field trips are great, but imagine students working alongside researchers, developing protocols, collecting data, and contributing to long-term studies and publications. Join our workshop and discover the empowerment, independence, and learning that comes with collaborating in cutting-edge field research.

### Visualizing Energy for Deeper Student Understanding

(Grades 10–12)

B215, GWCC

Science Focus: PS3

Sponsor: Perimeter Institute

**Tonia Williams** ([outreach@perimeterinstitute.ca](mailto:outreach@perimeterinstitute.ca)), Perimeter Institute for Theoretical Physics, Waterloo, ON, Canada

Why is understanding work and energy so difficult for students? Come explore different energy representations that help bridge the gap between the physical and the mathematical. We'll start with simple scenarios and then dive into more complex situations to demonstrate the explanatory power of energy representations in the classroom!

### Inquiry and Modeling-Based Digital Curriculum App for Conceptual Physics/Physical Science

(Grades 8–College)

B217, GWCC

Science Focus: PS2, PS3

Sponsor: Exploring Physics

**Doug Steinhoff** ([steinhoffd@missouri.edu](mailto:steinhoffd@missouri.edu)), University of Missouri, Columbia

**Meera Chandrasekhar** ([meerac@exploringphysics.com](mailto:meerac@exploringphysics.com)), Exploring Physics, Columbia, MO

Experience our hands-on curriculum app for physical science and conceptual physics on iPad, Chromebook, Mac/PC, designed as a combo workbook, textbook, and lab book. We will walk you through the features as you play with the app. E-mail [contact@exploringphysics.com](mailto:contact@exploringphysics.com) for a free sample unit. Bring your tablet/laptop.

### Making “STEM Available”

(Grades K–12)

B218, GWCC

Science Focus: GEN, NGSS

Sponsor: A+ STEM LABS

**Bill Waibel** ([bwaibel@aplusstemlabs.com](mailto:bwaibel@aplusstemlabs.com)), A+ STEM Labs, Inc., Bay Shore, NY

A+ STEM LABS manufactures cost-effective, turn-key technology teaching platforms in the form of mobile labs that combine state-of-the-art presentation technology, hands-on STEM tools, activities, and curriculum with management tools that enable the teacher to monitor, guide, and control students' technology use. To date, there are nearly 700 mobile labs integrated in the New York City school systems and beyond.

### What Do Crosscutting Concepts Look Like in a Middle School Classroom?

(Grades 6–8)

B302, GWCC

Science Focus: GEN, CCC7

Sponsor: Delta Education/School Specialty Science–FOSS

**Jessica Penchos**, The Lawrence Hall of Science, University of California, Berkeley

How can we support middle school students in integrating physical, Earth, and life science content to deepen understanding? Crosscutting concepts are the answer! Sample FOSS instructional materials in the context of a grade-level sequence, focusing on the crosscutting concept of stability and change.

### Collisions and Restraints: Solving Problems Through Engineering

(Grades 6–12)

B303, GWCC

Science Focus: ETS, PS

Sponsor: CPO Science/School Specialty Science

**Kat Mills**, School Specialty Science, Rosharon, TX

**Erik Benton**, CPO Science/School Specialty Science, Nashua, NH

Use your creativity to solve an automobile design problem with collisions and restraints using the CPO Science Link Energy Car. Learn how Newton's Third Law, conservation of energy, and momentum play a role in the solution with NGSS-ready investigations for middle school and high school physics and physical science.

### Comparative Anatomy of a Grant

(General)

B304, GWCC

Science Focus: GEN

Sponsor: Ward's Science

**Rusti Berent**, Ward's Science, West Henrietta, NY

Join us as we dissect two open grant applications to compare their language, format, and budget forms and gain a deeper understanding of what makes a winning proposal. Learn new skills to improve your own proposals, and leave with handouts and a head start on at least one grant application.

### What Is a Species?

(Grades 9–11)

B305, GWCC

Science Focus: LS4.A, CCC1, CCC2, SEP6, SEP7, SEP8

Sponsor: Lab-Aids, Inc.

**Mark Koker**, Lab-Aids, Inc., Ronkonkoma, NY

In this activity from the SEPUP high school biology program, participants learn about conditions that lead to speciation, including isolation due to temporal, geographical, and behavioral factors, and more. They then apply this knowledge to determine whether selected animal or plant pairs are in the early, mid, or late stages of speciation.

### Application of Presumptive Tests for Blood to Physical Evidence

(Grades 9–College)

B306, GWCC

Science Focus: LS

Sponsor: Fisher Science Education

**Chris Bily**, West Virginia University, Morgantown

When a reddish brown substance visually consistent with blood is found at a crime scene, it can't be assumed that it's blood without first testing it. There are a class of tests called presumptive tests that can be performed to determine

whether or not a substance might be blood. Learn how to conduct these tests. The workshop will conclude with a case study.

### Alzheimer's to Zoonosis: Using Disease to Teach Data Analysis

(Grades 9–College)

B308, GWCC

Science Focus: LS1.A, LS3, LS4.B, CCC1, CCC3, CCC6, CCC7, SEP4, SEP5, SEP6

Sponsor: HHMI BioInteractive

**Mary Wuerth** ([marywuerth@gmail.com](mailto:marywuerth@gmail.com)), Tamalpais High School, Mill Valley, CA

**Natalie Dutrow** ([ndutrow@judgememorial.com](mailto:ndutrow@judgememorial.com)), Judge Memorial Catholic High School, Salt Lake City, UT

Data points can help your students learn about trending diseases and practice data analysis skills. Join in to improve your understanding of statistics and learn how to use free BioInteractive resources to engage students in data analysis using the "hook" of diseases.

### 3-2-1 Blast Off!

(Grades 2–8)

B313, GWCC

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

Sponsor: Educational Innovations, Inc.

**Priscilla Robinson**, Educational Innovations, Inc., Portland, OR

What student doesn't like a burst of energy?! Elementary and middle school teachers join us for this fast-paced hands-on workshop that covers energy, forces, motion, and Newton's laws. Make your own stomp rockets as you explore elastic, potential, and kinetic energy and more! Lesson ideas, giveaways, and door prizes!

### From Big Bird to Bird Brains: Modeling Structure and Function in Biology with Help from Our Feathered Friends

(Grades 9–12)

B314, GWCC

Science Focus: LS

Sponsor: Houghton Mifflin Harcourt

**Stephen Nowicki**, Duke University, Durham, NC

Who doesn't like birds? Join Steve Nowicki, author of Houghton Mifflin Harcourt's *Biology*, as he takes you on a flight through avian science, illustrating ways you can bring science to life and help students understand how to model structure and function in organisms through demonstrations and hands-on activities with the help of what scientists have learned from our feathered friends.



### Take a Walk through the Molecular World with Watercolor Landscapes

(Grades 9–College)

B403, GWCC

Science Focus: LS1, LS3, PS1, CCC3, CCC4, CCC6, SEP1, SEP2

Sponsor: MSOE Center for BioMolecular Modeling

**Gina Vogt** ([gina.vogt@3dmoleculardesigns.com](mailto:gina.vogt@3dmoleculardesigns.com)), 3D Molecular Designs, Milwaukee, WI

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

Use vibrant watercolor landscapes to explore the molecular world in the cellular context within which proteins function. David Goodsell's Tour of the Human Cell Panorama traces the production and secretion of antibodies. His new Flu Fight: Immunity & Infection Panorama illustrates how antibodies work to block the influenza infection cycle.

### Assessment for Learning in the Age of NGSS: Revealing Student Thinking and Taking Action

(Grades K–8)

B404, GWCC

Science Focus: GEN, NGSS

Sponsor: Amplify

**Sophia Lambertsen** ([amplifyscience@berkeley.edu](mailto:amplifyscience@berkeley.edu)) and **Rebecca Abbott**, The Lawrence Hall of Science, University of California, Berkeley

Explore the formative assessment system for Amplify Science, which is designed to help teachers monitor and support students' three-dimensional learning by providing timely, actionable, and credible information and suggesting specific instructional responses tailored to that information.

### Space Station Explorers: Explore the Partner Programs That Take Science Education to SPACE!

(General)

B406, GWCC

Science Focus: ESS

Sponsor: Space Station Explorers/CASIS

**Dan Barstow** and **Diane Matthews**, CASIS, Melbourne, FL

Join Space Station Explorers and its partners to bring REAL SPACE science to your classroom. Organizations like DreamUp, Magnitude IO, Tomatosphere, Story Time from Space, ARISS, Orion's Quest, SciGirls in Space, and many more will be joining us to share how you can get involved in REAL SPACE research on the ISS (International Space Station National Lab). Your journey starts HERE!

### Catalyzing Your NGSS Implementation K–12

(General)

B408, GWCC

Science Focus: GEN, NGSS

Sponsor: Capitol Region Education Council

**Josiah Hills** and **Jaime Rechenberg**, Capitol Region Education Council, Hartford, CT

Learn about Connecticut's teacher-developed NGSS curricular resources and storyline development app, Catalyst Planner. We will showcase the curricular units and the Catalyst Planner app, and discuss the structure in which these K–12 units were developed. All of the K–12 curricular resources are built around a bundle of performance expectations, anchored in phenomena that is storylined, and three dimensional.

**12:30–1:00 PM Presentations****Podcasting into the 21st Century Through Science Research***(Grades K–8)**A303, GWCC*

Science Focus: GEN, NGSS

**Erin Doran** (@ErinDoran12; [dorane@etsu.edu](mailto:dorane@etsu.edu)), **Andrea Lowery** ([loweryar@etsu.edu](mailto:loweryar@etsu.edu)), and **Lindsay Lester** ([lesterl@etsu.edu](mailto:lesterl@etsu.edu)), University School, Johnson City, TN

Podcasting in your science classroom is an engaging way to incorporate literacy standards. Listen to student podcasts and learn how to implement them in your classroom!

**STEM on Station***(Grades 5–12)**A412a, GWCC*

Science Focus: ESS1, ETS, SEP

**Becky Kamas** (@beckykamas; [annamarie.r.kamas@nasa.gov](mailto:annamarie.r.kamas@nasa.gov)), NASA Johnson Space Center, Houston, TX  
NASA Education's STEM on Station helps bring the space station—and its rich STEM content—to students and educators.

**3-D STEAM Projects Improve Independence and Perseverance in a High-Poverty Community***(Grades 7–12)**C204, GWCC*

Science Focus: GEN, NGSS

**Kama Almasi** ([kama.almasi@lincoln.k12.or.us](mailto:kama.almasi@lincoln.k12.or.us)), Lincoln County School District, Newport, OR

**Melissa Steinman** (@PrincessofSci; [melissa.steinman@lincoln.k12.or.us](mailto:melissa.steinman@lincoln.k12.or.us)), Waldport High School, Waldport, OR

We present evidence for the positive impact of a three-dimensional and project-based approach on STEAM education and student perseverance in a small school within a high poverty community.

**SCST-Sponsored Session: Getting the Most Out of Peer-Led Team Learning (PLTL) Recitation Programs: Training, Organization, and Management***(College)**Hickory, Omni*

Science Focus: LS, PS

**Donna Pattison** ([dpattison@uh.edu](mailto:dpattison@uh.edu)), University of Houston, TX

I'll share the structure of a recitation program to support introductory biology and general physics along with our training materials.

**A STEM Minor for Elementary Teachers: Empowering!***(College)**International Ballroom D, Omni*

Science Focus: ESS3, ETS, LS1.A, LS1.C, LS2.C, PS1.A, PS2.C, PS3C

**Patricia Paulson** (@Pattipaulson1; [patricia-paulson@bethel.edu](mailto:patricia-paulson@bethel.edu)), Bethel University, Saint Paul, MN

Hear about the two years of planning and four of implementation for a STEM minor for elementary teacher candidates.

**Two Growth Mind-Set Activities to Help Motivate All Students and Teach Nature of Science***(Grades 4–12)**Juniper, Omni*

Science Focus: LS1.A, LS1.D, CCC1, CCC3, CCC4, CCC6, SEP2, SEP4, SEP5

**John Gensic** (@bioonthego; [john.gensic@gmail.com](mailto:john.gensic@gmail.com)), Penn High School, Mishawaka, IN

Struggling to motivate students? Get two research-based activities to help students discover and own a growth mind-set while working with data and nature of science.

**12:30–1:30 PM Meeting****ASTE-Sponsored Working Meeting: Elementary Science Teaching Methods***Sycamore, Omni*

Meet with fellow elementary science teaching methods instructors to share ideas and strategies, discuss problems, and brainstorm solutions.



### 12:30–1:30 PM Presentations

#### California Science Project Session: Supporting English Language Learners' Sense Making in Science

(Grades K–8)

A301, GWCC

Science Focus: PS4, CCC2, SEP2, SEP3

**Dawn O'Connor** (@dawno\_connor; dawno@acoe.org), Alameda County Office of Education, Hayward, CA

**Sabine Jeske** (sabine.jeske@ucsf.edu), UCSF Science & Health Education Partnership, San Francisco, CA

Explore phenomena related to waves (PS4-1). Make science accessible for all students using a tool targeting students' sense making.

#### Eureka! Science Trade Books—Good as Gold!

(Grades P–12)

A304, GWCC

Science Focus: GEN

**Emily Brady** (ebrady@nsta.org), Director, Special Projects, Content, NSTA, Arlington, VA

Need great books for student learning? Explore and use NSTA Recommends and the Children's Book Council Outstanding Science Trade Books. Door prizes—books, of course!

#### STEAM in Action

(Grades K–5)

A401, GWCC

Science Focus: ETS2.A

**Jennifer O'Sullivan** (@suntansnplans; jdavid18@fau.edu), A.D. Henderson University School, Boca Raton, FL  
Learn how our K–5 STEAM Lab has mixed a cardboard arcade with augmented reality, 3D printing with ceramics, Google Apps with worm composting, and more.

#### Science on the Go: Using Museum Resources to Support Place-Based Learning

(Grades K–8)

A407, GWCC

Science Focus: LS1, LS2

**Alexandra Campbell** (acampbell@naturemuseum.org) and **Holly Katz** (hkatz@naturemuseum.org), Chicago Academy of Sciences/Peggy Notebaert Nature Museum, Chicago, IL  
Hear how the Peggy Notebaert Nature Museum's Science on the Go program uses teacher professional development, museum educator-led lessons, and NGSS-focused curricula to support connected learning for students.

#### Using STEM-Related Picture Books to Encourage Students' Interest in STEM

(Grades P–5)

A408, GWCC

Science Focus: ETS1.A, ETS1.B, ETS2.A, SEP1, SEP8

**Laurie Wallmark** (@lauriewallmark; laurie.wallmark@raritanval.edu), Raritan Valley Community College, North Branch, NJ

Expose your students to the joys of STEM through reading and by creating STEM-related picture books, whether fiction or nonfiction.

#### Dumbledore's Transfiguration Class: Science and Magic from Hogwarts Academy

(Grades 3–9)

B309, GWCC

Science Focus: ETS1, PS, SEP

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

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

#### The InVenture Challenge: Developing Future Innovators Through Invention and Entrepreneurship Experiences

(Grades K–12)

B402, GWCC

Science Focus: ETS1, INF, SEP1, SEP6

**Roxanne Moore** (roxanne.moore@gatech.edu), Georgia Institute of Technology, Atlanta

**Amanda Baskett** (akbaskett@gmail.com), Rockdale Magnet School for Science and Technology, Conyers, GA

The InVenture Challenge is an invention competition for K–12 students that intends to foster innovation and broaden the STEM pipeline through inclusive, authentic design experiences.

#### Solving Mysteries and Saving Lives: How Scientific Inquiry and Creativity Drive Scientific Discovery and Innovation

(Grades 6–12)

C202, GWCC

Science Focus: LS1.A, LS1.B, LS3, LS4.D, CCC1, CCC2, CCC3, CCC4, CCC6, CCC7, SEP

**Brittany Joslin** (bjoslin@millenniumbrooklynhs.org), Millennium Brooklyn High School, Brooklyn, NY

Discover how to incorporate a project in which students determine the identity of a mysterious disease outbreak, and then propose how to contain it and prevent future outbreaks.

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**NSTA** National  
Science  
Teachers  
Association

### **Taking STEM Outdoors: Connecting STEM and Conservation Education**

(Grades 5–10)

C205, GWCC

Science Focus: ETS2, LS2.A, LS2.B, CCC2, CCC5, CCC7, SEP1, SEP4, SEP6, SEP7, SEP8

**Heidi Bjerke** (@hbjerke; [hbjerke@gmail.com](mailto:hbjerke@gmail.com)), Jefferson Middle School, Champaign, IL

Learn how to help students gain an insight into the wildlife found in their neighborhood and connect it with STEM activities.

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

(Grades 6–10)

C210, GWCC

Science Focus: ESS3.A, ESS3.B, ESS3.C, ETS, LS2, PS2, PS3, CCC1, CCC2, CCC4, SEP

**Aubrey Crook**, Georgia Youth Science and Technology Centers, Inc., Kennesaw

**Yaquita Porter** ([yaquita.porter@gmail.com](mailto:yaquita.porter@gmail.com)), Leadership Preparatory Academy, Lithonia, GA

Would you like to incorporate drones into your curriculum, but are clueless as to how to get started? During this session, you will learn some basic information to get your drone program up and soaring.

### **Merging Three-Dimensional Assessments with Standards-Based Grading**

(Grades 6–12)

C213, GWCC

Science Focus: LS

**Chris Embry-Mohr** ([chrisebry.mohr@olympia.org](mailto:chrisebry.mohr@olympia.org)), Olympia High School, Stanford, IL

How can NGSS-focused assessments address the key principles of Standards-Based Grading? Let's take a look at some high school assessment examples that merge three-dimensional assessment with SBG.

### **Tesla Tales**

(Grades 6–12)

C301, GWCC

Science Focus: PS2, PS3

**Carlos Villa** ([villa@magnet.fsu.edu](mailto:villa@magnet.fsu.edu)), National High Magnetic Field Laboratory, Tallahassee, FL

Follow the path of discovery through the history of electromagnetism with ideas for bringing these scientists and their discoveries into your classroom.

### **Systems Modeling Everyone Can Do**

(Grades 8–College)

Birch, Omni

Science Focus: ESS3, ETS, LS1, LS2, PS2, CCC4, CCC2, CCC6, CCC7

**Diana Fisher** ([fisherd@pdx.edu](mailto:fisherd@pdx.edu)), Portland State University, Portland, OR

Get your students modeling ecosystems, disease spread, rockets, and more. Hear about dynamic feedback systems that have been successfully used for 20 years in high schools.

### **Claims, Evidence, and Reasoning (CER) and Interactive Word Walls**

(Grades K–12)

Dogwood B, Omni

Science Focus: GEN, SEP

**Julie Jackson** (@ScienceToolkit; [jj32@txstate.edu](mailto:jj32@txstate.edu)), Texas State University, San Marcos

The CER Framework and interactive word walls provide students with a structure they can use in their science writing, oral presentations, and classroom discussions.

### **NARST-Sponsored Session: Understanding Cross-cutting Concepts in 3-D Science Learning: Strategies for Designing Lessons and Assessments**

(Grades K–12)

Grand Ballroom C, Omni

Science Focus: GEN, CCC

**Ann Rivet** (@arivet6; [ribbit216@yahoo.com](mailto:ribbit216@yahoo.com)), Teachers College, Columbia University, New York, NY

Find out more about the NGSS crosscutting concepts, including how they relate to disciplinary core ideas and science practices, and ways they integrate into instruction and assessments.

### **What's App, Doc: Using Technology in Professional Learning**

(General)

International Ballroom C, Omni

Science Focus: GEN

**Lisa Bohn** ([lbohn@astate.edu](mailto:lbohn@astate.edu)), Arkansas State University, Jonesboro

**Elizabeth Allan** ([eallan@uco.edu](mailto:eallan@uco.edu)), NSTA Director, College Science Teaching, and University of Central Oklahoma, Edmond

**Pat Shane** ([pshane@unc.edu](mailto:pshane@unc.edu)), 2009–2010 NSTA President, Chapel Hill, NC

We will demonstrate and discuss free apps that can be used to enhance the essential elements of successful professional learning: preplanning, implementation, and evaluation.

### NSELA-Sponsored Session: Leadership Strategies Using NGSS as a Foundation to Ensure Each Student Has a STEM Future

(Grades P–12)

*Magnolia, Omni*

Science Focus: GEN, NGSS

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

**Brian Day** ([bday@everettsd.org](mailto:bday@everettsd.org)), Everett (WA) Public Schools Engage in strategies and tools used to implement a district-wide STEM program impacting each student. Move from providing science literacy to ensuring a STEM future.

### Using Fiction Books to Teach STEM

(Grades K–12)

*Maple C, South Tower, Omni*

Science Focus: GEN, SEP8

**Shelli Wells** ([@srjohnnes](mailto:srjohnnes); [shelli@srjohannes.com](mailto:shelli@srjohannes.com)), Children's Author, Atlanta, GA

**Kimberly Derting** ([@kimberlyderting](mailto:kimberlyderting); [kim@kimberlyderting.com](mailto:kim@kimberlyderting.com)), Children's Book Author, Bonney Lake, WA

Use fiction books to teach core science concepts and multi-genre writing. Discuss popular fiction (picture book, middle

grades, and young adult examples) and hear how you can use those books to reinforce science concepts. Also, find out how to use fiction when teaching multi-genre writing in science.

### High School Science OER Course Project

(Grades 8–College)

*Walnut, Omni*

Science Focus: ESS, PS

**Andrew Boyd** ([@boydscience](mailto:@boydscience); [boydscience@gmail.com](mailto:boydscience@gmail.com)) and **Mechelle LaLanne** ([@mechellencesd](mailto:@mechellencesd); [mechellel@ncesd.org](mailto:mechellel@ncesd.org)), North Central ESD, Wenatchee, WA

Experience a high school curriculum that meets the NGSS. This important work is shared as an Open Education Resource (OER) so all districts can benefit.

### 12:30–1:30 PM Hands-On Workshops PolarTREC and NASA's Operation IceBridge: Using Real Data in Your Classroom

(Grades 6–12)

*A302, GWCC*

Science Focus: ESS2, ETS2, CCC1, CCC4, CCC7, SEP4

**Mark Buesing** ([mark.buesing@d128.org](mailto:mark.buesing@d128.org)), Libertyville High School, Libertyville, IL

**Adeena Teres** ([@A\\_Ter8](mailto:@A_Ter8); [adeenateres@yahoo.com](mailto:adeenateres@yahoo.com)), Stoneman Douglas High School, Pompano Beach, FL

**Maggie Kane** ([maggielane0@gmail.com](mailto:maggielane0@gmail.com)), Prescott (AZ) Unified School District #1

**Kelly McCarthy** ([@kmcCarthy317](mailto:@kmcCarthy317); [kxm5002@gmail.com](mailto:kxm5002@gmail.com)), Our Lady of Lourdes Regional School, Coal Township, PA Use real data collected on actual airborne science missions in your classroom. Participants will set up accounts at the National Snow and Ice Data Center, which will allow them to download actual data from NASA's Operation IceBridge. We will use downloaded data sets to create graphs and plots to visualize the data. Teach your students to be climate scientists! Please bring a tablet/laptop with data connection.

### Citizen Science and Authentic Research Through the Mapping of the Moon

(Grades 6–12)

*A305, GWCC*

Science Focus: ESS1, SEP4

**Larry Lebofsky** ([lebofsky@lpl.arizona.edu](mailto:lebofsky@lpl.arizona.edu)), Planetary Science Institute, Tucson, AZ

**Lisa Strishock** ([@cosmoquestX](mailto:@cosmoquestX); [l.strishock@gmail.com](mailto:l.strishock@gmail.com)), The University of Arizona, Tucson

NASA images the Moon in remarkable detail. With these images, students study the solar system's history and how geological features vary from world to world.

### Developing STEM Lessons with Authentic Integration of Science and Math

(Grades K–8)

*A315, GWCC*

Science Focus: GEN, SEP1, SEP4, SEP5, SEP6

**Tonya Woolfolk** ([tonya.woolfolk@hcbe.net](mailto:tonya.woolfolk@hcbe.net)), **Ann Williams-Brown** ([ann.williams-brown@hcbe.net](mailto:ann.williams-brown@hcbe.net)), and **Nikki Cooper** ([nikki.cooper@hcbe.net](mailto:nikki.cooper@hcbe.net)), Houston County School District, Perry, GA

Content experts have collaboratively developed a process for planning STEM lessons. Participants will be guided through this process while engaging in inquiry-based STEM activities.

**Trade Books and 3-D for Developing a Seeds Unit**  
(Grades 1–5) A316, GWCC

Science Focus: LS

**Lloyd Barrow** ([barrowl@missouri.edu](mailto:barrowl@missouri.edu)), Professor Emeritus, University of Missouri, Columbia

Using a popular seed trade book, we will promote student learning about seeds. NGSS correlations will be shared and common misconceptions will be addressed, including seed dispersal.

**STEAM PBL: Integrating 3-D Science with 21st-Century Skills**

(Grades K–12)

A402, GWCC

Science Focus: GEN, NGSS

**Jeremy Peacock** ([@jeremy\\_peacock](mailto:@jeremy_peacock); [peacock.jeremy@gmail.com](mailto:peacock.jeremy@gmail.com)), Program Coordinator, NSTA Atlanta National Conference, and Northeast Georgia RESA, Winterville

**Jolaine Whitehead** ([jolaine.whitehead@negaresa.org](mailto:jolaine.whitehead@negaresa.org)), Oconee River GYSTC, Winterville, GA

**Ashley Potter** ([ashley.potter@morgan.k12.ga.us](mailto:ashley.potter@morgan.k12.ga.us)), Morgan County Charter School System, Madison, GA

How can you engage students in STEAM without losing focus on science? Learn how Morgan County teachers use Project-Based Learning to integrate STEAM/3-D science.

**Evidence and Explanations: Energy Changes and Transformations in a Bouncing, Flashing Ball**

(Grades 3–8)

A403, GWCC

Science Focus: PS3

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

Come play with a bouncing, flashing ball to make observations as evidence to explain types of energy changes and transfers.

**Scientific Explanations for the Young Scholar**

(Grades K–5)

A404, GWCC

Science Focus: GEN, SEP6, SEP7, SEP8

**Ana Appel** ([ana.appel@ascendlearning.org](mailto:ana.appel@ascendlearning.org)), Ascend Learning, Brooklyn, NY

Emphasis will be placed on scientific explanations linking NGSS and CCSS. Learn to teach scientific writing in K–5. Leave with samples, templates, and techniques.

**Made for the Shade: A SUN-Sational Engineering Design Unit**

(Grades K–2)

A405, GWCC

Science Focus: ETS1, PS, CCC2, SEP1, SEP2, SEP3, SEP4, SEP6, SEP8

**Laura Kitagawa** ([lkitagawa@a-cs.org](mailto:lkitagawa@a-cs.org)), Almaden Country Day School, San Jose, CA

Inspire your students to design and build shade structures to protect UV-sensitive bearded lizards from the Sun. Get everything you need, including your own lizard!

**Creating Teachable Moments for Elementary Science Through Literature**

(Grades K–5)

A410, GWCC

Science Focus: ESS1, ETS1, LS2, LS4.C, LS4.D, PS2, CCC2, CCC3, CCC6, SEP

**Chris Campbell** ([@UTeachTech](mailto:@UTeachTech); [ctc@latech.edu](mailto:ctc@latech.edu)) and **Diane Madden** ([dmadden@latech.edu](mailto:dmadden@latech.edu)), UTeachTech at Louisiana Tech University, Ruston

Having trouble fitting in the required content? Running out of time before you get to science? Come learn to create teachable moments for STEM through self-guided reading and hands-on investigation stations. ELA resources provided.



**NGSS@NSTA Forum Session: Disruptions in Ecosystems: An NGSS-Designed Middle School Unit and PD Model**

(Grades K–12)

B102, GWCC

Science Focus: LS2

**Dora Kastel** ([@Dora\\_Kastel](mailto:@Dora_Kastel); [kastel.dora@gmail.com](mailto:kastel.dora@gmail.com)), New Visions for Public Schools, New York, NY

**Anna MacPherson** ([amacpherson@amnh.org](mailto:amacpherson@amnh.org)), American Museum of Natural History, New York, NY

**Maia Binding** ([@SEPUP\\_UCB](mailto:@SEPUP_UCB); [mbinding@berkeley.edu](mailto:mbinding@berkeley.edu)), The Lawrence Hall of Science, University of California, Berkeley

Presider: Ted Willard ([twillard@nsta.org](mailto:twillard@nsta.org)), Assistant Executive Director, Science Standards, NSTA, Arlington, VA

We will explore the key features of instructional materials designed to translate three-dimensional standards into practice. Learn about this NSF-funded project and the findings from three years of field testing.



### NESTA and NOAA Ocean, Climate, and Weather Share-a-Thon

(Grades K–11)

B103, GWCC

Science Focus: ESS2, ESS3.B, ESS3.C, ESS3.D, CCC1, CCC4, SEP

**Belinda Jacobs** (@NESTA\_US; [bjrockgirl111@gmail.com](mailto:bjrockgirl111@gmail.com)), Cedar Ridge High School, Round Rock, TX

**Michael Passow** ([michael@earth2class.org](mailto:michael@earth2class.org)), Retired Teacher, Englewood, NJ

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



### NSTA Press® Session: From Flower to Fruit

(Grades 2–8/College)

B405, GWCC

Science Focus: LS

**Richard Konicek-Moran** ([rkonicek@gmail.com](mailto:rkonicek@gmail.com)), Professor Emeritus, UMass Amherst, MA

**Kathleen Konicek-Moran** ([kathleen.konmor@gmail.com](mailto:kathleen.konmor@gmail.com)), Botanical Illustrator and Nature Artist, Bradenton, FL

Put botany back in your curriculum with this NSTA Kids book. We will use a formative assessment and show how this book can be used to teach children about pollination, pollinators, and fertilization leading to the development of fruit.

### Teach Evolution with the World's Most Extravagant Birds

(Grades 6–12)

C203, GWCC

Science Focus: LS

**Kathy Rigling** ([riglingk@aol.com](mailto:riglingk@aol.com)), Piedmont Lakes Middle School, Apopka, FL

**Lindsay Glasner** (@BirdSleuth; [lig27@cornell.edu](mailto:lig27@cornell.edu)), The Cornell Lab of Ornithology, Ithaca, NY

Watch out Darwin's finches, a brighter bird is the new biology teacher in town! Learn to teach evolution and natural selection through the birds-of-paradise.

### Sound and Waves (PS4): An Integrated K–8 Hands-On Approach Supporting the NGSS and CCSS ELA

(Grades P–8)

C206, GWCC

Science Focus: PS4, CCC1, CCC5, SEP

**Chihche Tai** ([cctai59@gmail.com](mailto:cctai59@gmail.com)), **Renee Moran** ([ricemoran@etsu.edu](mailto:ricemoran@etsu.edu)), and **Karin Keith** ([keithkj@etsu.edu](mailto:keithkj@etsu.edu)), East Tennessee State University, Johnson City

**Ruth Leonard** (@chem2t), Sullivan County Schools, Blountville, TN

Receive practical ideas to build understanding about how to combine reading and hands-on activities as tools to understand the nature of wave movement.

### CSI in a Differentiated Classroom

(Grades 9–12)

C209, GWCC

Science Focus: GEN, SEP

**Dawn Staples-Knox** and **Leanne Groening**, Searsport District Middle School and High School, Searsport, ME

Find out how ALL students can develop claim, evidence, and reasoning skills in an interdisciplinary class. Participate in our favorite literacy and differentiation strategies.



### Inclusive STEM Centers—It's More Than Content: Lessons from My Second Graders

(Grades P–3)

B211, GWCC

Science Focus: GEN, NGSS

**Beth VanMeeteren** ([beth.vanmeeteren@uni.edu](mailto:beth.vanmeeteren@uni.edu)), University of Northern Iowa, Cedar Falls

**Brenda Kaufmann** (@brenhawks; [kaufmann@n-tama.k12.ia.us](mailto:kaufmann@n-tama.k12.ia.us)), North Tama County Community School District, Traer, IA

Learn how second graders with daily access to open-ended STEM centers in addition to planned NGSS-focused investigations deepen their interest and ability in conducting investigations and solving problems.



### Improving Science Practices Through Evaluating Scientific Journal Articles

(Grades 9–College)

B212, GWCC

Science Focus: GEN, SEP2, SEP4, SEP8

**Christina Palffy** ([cpalffy@d125.org](mailto:cpalffy@d125.org)), Adlai E. Stevenson High School, Lincolnshire, IL

We will provide concrete scaffolded methods for teaching students to effectively and thoroughly understand text, evaluate data, and model design presented in scientific journal articles.

### 3D Using Phenomena in the Physical Sciences

(Grades 8–12)

B401, GWCC

Science Focus: PS, SEP7

**Philip Matthews** (@PSMatthews21; [philip.matthews@cobbk12.org](mailto:philip.matthews@cobbk12.org)), Kennesaw Mountain High School, Kennesaw, GA

We will discuss the characteristics and specific examples of phenomena that can be implemented in physical science, chemistry, and physics courses.

### Bioengineering Challenges and Middle School Life Science

(Grades 6–9)

C211, GWCC

Science Focus: ETS1, LS, CCC2, CCC6, SEP2, SEP3, SEP4, SEP6

**John Howarth** ([john\\_howarth@berkeley.edu](mailto:john_howarth@berkeley.edu)), The Lawrence Hall of Science, University of California, Berkeley

**Timothy Hurt** ([thurt@berkeley.edu](mailto:thurt@berkeley.edu)), SEPUP, Berkeley, CA  
Participate in a hands-on activity that integrates engineering practices and three-dimensional learning in the context of middle school life science.

### Reaction Rates Phenomena Through Assessment

(Grades 9–12)

C212, GWCC

Science Focus: PS1.B

**Stacie Sanders** ([ssanders@rjuhsd.us](mailto:ssanders@rjuhsd.us)) and **Concettina Sutliff** ([sutliff.connie@att.net](mailto:sutliff.connie@att.net)), Woodcreek High School, Rocklin, CA

We will share a 5E model-based college prep chemistry lesson on reaction rates (NGSS HS-PS1-5). Using the phenomena of glow sticks, students are introduced to the concept of reaction rates. We will take you through the entire lesson including a three-dimensional CER explanation assessment.



### Ready-STEM-Go: Use Rubber Band–Powered Cars to Drive a Cross-Curricular Unit

(Grades 5–8)

C302, GWCC

Science Focus: ETS1, PS2.A, PS3.B

**Jill Marconi** ([@STEM4ME](mailto:@STEM4ME); [jmarconi@polandschools.org](mailto:jmarconi@polandschools.org)) and **Leslie Monteiro**, Poland Middle School, Youngstown, OH

**Nancy Moon**, McKinley Elementary School, Youngstown, OH

Rev up new learning as you build a car (made out of affordable material) and then learn how the device can travel at school for a real-world learning experience.

### Tools of the Trade: 3-D Science in the Everyday Classroom

(Grades 5–12)

Dogwood A, Omni

Science Focus: ESS2.A, ESS2.C, ESS2.D, ESS2.E, ESS3.A, ESS3.C, ESS3.D, ETS2.B, LS2.A, LS2.B, PS1.A, PS2.A, PS3.C, CCC2, CCC4, CCC5, CCC6, CCC7, SEP1, SEP2, SEP6, SEP7, SEP8, SEP4

**Candria Eddinger** ([@candyeddinger](mailto:@candyeddinger); [candriaeddinger@dadecs.org](mailto:candriaeddinger@dadecs.org)), Dade County Schools, Trenton, GA

What does a three-dimensional classroom look like? Come develop engaging, phenomena-based lessons and take away the resources to support you from beginning to end.

### Accessibility for the Blind and Vision Impaired: Engaging Students in the Engineering Design Process Through a Human-Centered Module

(Grades 9–College)

Grand Ballroom B, Omni

Science Focus: ETS, CCC3

**Manuel Figueroa** ([@FigueroaTECH](mailto:@FigueroaTECH); [manuel.figueroa@tcnj.edu](mailto:manuel.figueroa@tcnj.edu)) and **Samantha Moorzitz** ([@MissMoorzitz](mailto:@MissMoorzitz); [moorzisl@tcnj.edu](mailto:moorzisl@tcnj.edu)), The College of New Jersey, Trenton

Take part in a low-vision simulation and then redesign a room to increase accessibility for people with vision impairments.

### ASTE-Sponsored Session: Flipping the Science Content Classroom for Preservice Elementary Teachers with the NSTA Learning Center

(College)

Spruce, South Tower, Omni

Science Focus: GEN

**Donna Governor** ([donna.governor@ung.edu](mailto:donna.governor@ung.edu)) and **David Osmond** ([david.osmond@ung.edu](mailto:david.osmond@ung.edu)), University of North Georgia, Oakwood

The NSTA Learning Center is the perfect vehicle for instruction with preservice teachers. Get the tools to build a custom course—rich with content, pedagogy, and opportunity for future teachers.

**12:30–1:30 PM Exhibitor Workshops****From CRISPR to Three-Parent Babies and Back Again: What to Tell Our Students About the Coming Revolution in Human Biology***(Grades 9–12)**B216, GWCC*

Science Focus: LS

Sponsor: Pearson Learning Services

**Kenneth Miller**, Brown University, Providence, RI

Although genetic engineering and molecular biology have been part of the biology curriculum for decades, the past several years have seen the introduction of new techniques that dramatically alter the landscape of human biology. Discussion centers on how these powerful techniques work and ways to incorporate them into the curriculum, as well as explore the promise and peril that awaits the brave new world of human genetic modification.

**Demystifying Phenomenon: Earthquake-Proof Towers and Engineering Design***(Grades 3–12)**B301, GWCC*

Science Focus: ESS3, ETS1.B, PS4.A, CCC2, SEP2

Sponsor: STEMscopes

**Valerie Sellers** ([vsellers@acceleratelearning.com](mailto:vsellers@acceleratelearning.com)), STEMscopes, Houston, TX

While investigating the phenomenon of waves, we will use three models to design and build earthquake-proof towers that can withstand the devastating horizontal S waves. Using models, simulations, and tower engineering, we will demystify the three-dimensional NGSS core idea for waves, the practices of engineering design, and how best to teach them through STEM.




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THE UNIVERSITY OF ALABAMA College of Engineering

### What's in the Water? Colorimetry and Conductivity of Solutions

(Grades 9–12)

B315, GWCC

Science Focus: PS1.A, CCC1, CCC3, SEP2, SEP5

Sponsor: PASCO scientific

**Jason Lee**, East Georgia State College—Statesboro

Water is a precious resource but certain solutes can threaten that resource. Help students understand the importance of identifying and quantifying solutes in solution. Using the new Wireless Colorimeter and Wireless Conductivity sensor, your students will get a deeper understanding of water and solutions!

### Use Free GIS to Launch Weather Units into the Stratosphere

(Grades 9–12)

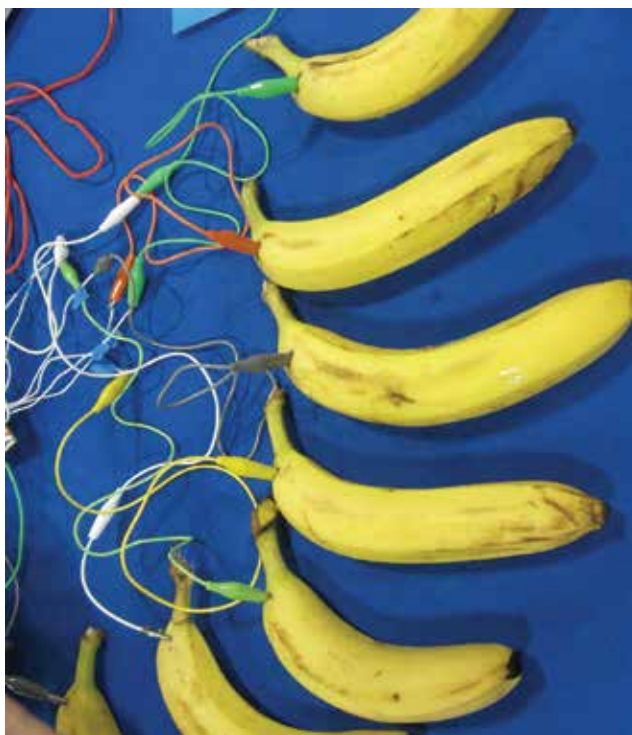
B316, GWCC

Science Focus: ESS2.D, ESS3.C, ESS3.D, SEP4, SEP5, SEP7

Sponsor: PASCO scientific

**Roger Palmer**, Bishop Dunne Catholic School, Dallas, TX

Understanding global phenomena such as climate change can be difficult and abstract for students. We'll make local measurements demonstrate how lots of individual datasets can be combined to create big understandings. By building on that experience, analyze global GIS data to understand the changing world and human impact.



### 12:30–2:30 PM Hands-On Workshop

#### INF Community Connections Share-a-Thon

(General)

B101, GWCC

Science Focus: INF, CCC, SEP

**Sarah Carter** ([scarter@tpt.org](mailto:scarter@tpt.org)), Twin Cities Public Television, St. Paul, MN

**Laura Conner** ([ldconner@alaska.edu](mailto:ldconner@alaska.edu)), University of Alaska Fairbanks

**Margaret Glass** and **Ann Hernandez**, Association of Science-Technology Centers, Washington, DC

**Eric Hamilton** ([ehamilton@amnh.org](mailto:ehamilton@amnh.org)), American Museum of Natural History, New York, NY

**Erin Johnson** ([ejohnson@cfa.harvard.edu](mailto:ejohnson@cfa.harvard.edu)) and **Patricia Udomprasert** ([pudompra@cfa.harvard.edu](mailto:pudompra@cfa.harvard.edu)), Harvard University, Cambridge, MA

**Brian Kruse** ([bkruse@astrosociety.org](mailto:bkruse@astrosociety.org)), Astronomical Society of the Pacific, San Francisco, CA

**Nicole Kurtz** ([nkurtz@ldeo.columbia.edu](mailto:nkurtz@ldeo.columbia.edu)), International Ocean Discovery Program, Palisades, NY

**Tina Lanese**, Science Buddies, Milpitas, CA

**Stefanie McDermott** ([stefanie.mcdermott@aps.edu](mailto:stefanie.mcdermott@aps.edu)) and

**Marc Wunder** ([marc.wunder@aps.edu](mailto:marc.wunder@aps.edu)), Albuquerque (NM) Public Schools

**Jasmine Miller-Kleinhenz** ([jmill37@emory.edu](mailto:jmill37@emory.edu)), Emory University, Atlanta, GA

**Danielle Newman**, Kell Robotics and Kennesaw Mountain High School, Kennesaw, GA

**Deb Novak** ([deb.novak@state.nm.us](mailto:deb.novak@state.nm.us)), NSTA Director, District XIII, and New Mexico Museum of Natural History and Science, Albuquerque

**Dennis Schatz** ([dschatz@pacsci.org](mailto:dschatz@pacsci.org)), NSTA President-Elect; NSTA Director, Informal Science; and Pacific Science Center, Seattle, WA

**Mackenzie Sicard**, North Cobb High School, Kennesaw, GA

**Sara Smith** ([smiths@tmcc.org](mailto:smiths@tmcc.org)), The Marine Mammal Center, Sausalito, CA

**Theresa Summer** ([tsummer@astrosociety.org](mailto:tsummer@astrosociety.org)), Astronomical Society of the Pacific, San Francisco, CA

Presider: **Lindsay Milner** ([lindsaym@madscience.org](mailto:lindsaym@madscience.org)), Mad Science Group Inc., Montreal, QC, Canada

Come connect with folks who bring you exciting resources, programs, and opportunities available from museums, after-school, media, and other informal science education providers!

**CSSS-Sponsored Session: Formative Assessments of Learners' Interests, Identities, and Knowledge**

(General)

*Cottonwood A/B, Omni*

Science Focus: GEN, NGSS

**Philip Bell** (@philipbell; [pbell@uw.edu](mailto:pbell@uw.edu)), University of Washington, Seattle

**William Penuel** (@bpenuel; @ACESSEProject; [william.penuel@colorado.edu](mailto:william.penuel@colorado.edu)), University of Colorado Boulder

Discover how to focus instruction on the ways that students make sense of the world using a formative assessment approach.

**12:45–1:30 PM Special Session**

**“Meet and Greet” the Presidents and Board/Council**

(General)

*NSTA Exhibits Entrance (Hall B2), GWCC*

Be sure to stop by to “meet and greet” your elected NSTA officers on your way to the exhibits. The President, President-Elect, and Retiring President along with your Board and Council members are looking forward to talking with you at the conference! One lucky person who attends this event will be eligible to win a \$100 gift certificate to the NSTA Science Store. Must be present to win. Drawing will take place at 1:20 PM.



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For information and to register, visit [www.nsta.org/stemforum](http://www.nsta.org/stemforum)

**NSTA** National Science Teachers Association



### 1:00–1:30 PM Presentation

#### The What, the Why, and the How of Using iPads for Incorporating Literacy into the Science Classroom

(Grades P–8)

A303, GWCC

Science Focus: ETS, CCC

**Amber Kersey** (*kersey@bcssk12.org*), Henderson Middle School, Jackson, GA

Discussion centers on various resources using iPads while focusing on the impact of literacy in the middle grades science classroom.

#### Meet Me in the Middle Session: Assessment in Three Dimensions

(Grades 6–8)

A311, GWCC

Science Focus: GEN, NGSS

**Susan German** (*@susan\_german*; *susangermanscienceteacher@gmail.com*), Hallsville Middle School, Hallsville, MO  
Three-dimensional assessment is a challenge. Participants will leave with example tasks and written assessments, and tips on creating their own.

#### Meet Me in the Middle Session: Using Agriculture to Enhance STEM Education

(Grade 7)

A314, GWCC

Science Focus: LS, SEP

**Monique Mitchell-Eames** (*monique.mitchell@broward-schools.com*), Millennium Middle School, Tamarac, FL  
School gardens provide an opportunity for teachers and students to explore meaningful connections with science education and the environment. Unearth the many ways to bring STEM to life using a school garden.

#### Engaging and Immersing All Students in an Ocean of STEM

(Grades K–12)

A412a, GWCC

Science Focus: ESS2.C, ESS3, ETS, LS1.B, LS2, LS3, LS4.C, LS4.A, CCC

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

Dive into STEM resources as we explore the ocean using the NGSS. Learn ways to build critical thinking and applied skills that will give all students a tool “kit” to help them reach new depths of knowledge that will take them beyond the classroom. Discover free resources that will connect students to real-time exploration and science.

#### Building Cultural Competence and Critical Consciousness Through Science

(Grades 6–12)

C204, GWCC

Science Focus: GEN

**Sonia Howard** (*@TheMsHowie*; *showard18@student.gsu.edu*), Georgia State University, Atlanta

Let’s discuss how science, cultural competence, and critical consciousness fit together perfectly in the movement toward “Science for All.”

#### SCST-Sponsored Session: Improving Student Accessibility for Diverse Student Populations in Core Curriculum Science Coursework

(College)

Hickory, Omni

Science Focus: GEN

**Brian Shmaefsky** (*brian.r.shmaefsky@lonestar.edu*), Lone Star College–Kingwood, TX

Review findings from a study on successful methods for improving student success and completion in core science courses. The focus was on providing more accessibility to underrepresented and at-risk college students.

#### Integrating Math with Life Science: Four Middle School/High School Hands-On STEM Activities

(Grades 5–10/College)

International Ballroom D, Omni

Science Focus: LS2, LS3, LS4, SEP

**Lisa Pike** (*@pikelisa*; *lpik@fmarion.edu*), Francis Marion University, Florence, SC

Survivorship curves, seed dispersal, plankton, and diffusion. What do they have in common? See how these standards-focused STEM inquiries get students excited about math.

#### Engineering Technology: The Other Engineering Degree for a STEM World

(Grades 9–College)

Juniper, Omni

Science Focus: ETS

**Joyce Gleason** (*joycegle@earthlink.net*), Educational Consultant, Punta Gorda, FL

Engineering Technology (ET) is an overlooked option for a four-year engineering degree. It emphasizes a hands-on, practical approach. Come learn more!

**1:00–1:30 PM Hands-On Workshop****Meet Me in the Middle Session: Engineering in Middle School Chemistry***(Grades 6–8)**A312, GWCC*

Science Focus: ETS1, PS, SEP

**James Kessler**, American Chemical Society, Washington, DC

Try a new engineering design lesson based on chemical reactions featured in the free teaching resource [www.middle-schoolchemistry.com](http://www.middle-schoolchemistry.com).

**1:00–2:30 PM Exhibitor Workshops****Use Science, Coding, and Robotics in the Elementary Classroom to Solve Real-World Problems***(Grades K–5)**B409, GWCC*

Science Focus: ESS, ETS, LS

Sponsor: LEGO Education

**Laura Jackson**, Retired Science Teacher, Lee's Summit, MO

Build and code robotic models while exploring exciting Earth, space, and life science lessons. Learn the importance of teaching coding and computational thinking at the elementary level and leave with concrete activities that will empower your students to solve real-world problems.

**1:45–2:15 PM Presentations****INF Meet Me in the Middle Session: Teachers, Youth Support Organizations, and Universities Working Together to Build Strong After-School STEM Learning Programs***(Grades 5–8)**A311, GWCC*

Science Focus: INF, CCC, SEP

**Michael Kennedy** ([m-kennedy@northwestern.edu](mailto:m-kennedy@northwestern.edu)), Northwestern University, Evanston, IL

Discussion centers on the programmatic, curricular, and mentor support aspects of Science Club, an award-winning after-school program based in the Chicago metro area.

**1:45–2:15 PM Hands-On Workshop****Meet Me in the Middle Session: Paper Pets: A Fun Way to Teach Genetics and Natural Selection***(Grades 6–9)**A313, GWCC*

Science Focus: LS3, LS4.B, CCC1, CCC6, CCC7, SEP2

**Bruce Boehne** ([@BBoehne](mailto:@BBoehne); [bboehne@ziondallas.org](mailto:bboehne@ziondallas.org)), Zion Lutheran School, Dallas, TX

Students create their own “pets” using genotypes to express phenotypes. They then “breed” their pets with other pets to produce offspring guided by Punnett squares. Finally, random environmental factors determine which of the offspring survive to breed again.

**Meet Me in the Middle Session: Are You Growing as a Teacher?***(Grades 3–11)**A312, GWCC*

Science Focus: GEN

**Kathy Biernat** ([@ScientistMaker](mailto:@ScientistMaker); [kathybiernat@gmail.com](mailto:kathybiernat@gmail.com)), St. Mary's Visitation School, Elm Grove, WI**Diane Ripollone** ([@ripping77](mailto:@ripping77); [ripping77@nc.rr.com](mailto:ripping77@nc.rr.com)), Cardinal Gibbons High School, Raleigh, NC

Attention will be paid to goal setting and specific techniques to help you grow as a professional, including resources and networks that will assist in that effort.

**Meet Me in the Middle Session: Using STEAM and Literacy to Teach Ecology in an Urban Classroom***(Grades 5–8)**A314, GWCC*

Science Focus: LS, CCC, SEP

**Elizabeth Weissman** ([weissmane@ramaz.org](mailto:weissmane@ramaz.org)), The Ramaz School, New York, NY

Learn how ecological concepts can be taught in an urban classroom by incorporating STEM, literacy, and art in several STEAM Project-Based Learning formats.



## 2:00–2:30 PM Presentations

### A Rising Tide Lifts All Boats: Easy-Teach Strategies to Raise Achievement for English Language Learners

(Grades 7–12)

C204, GWCC

Science Focus: LS

**Justin Hooten** (@ScienceIsAHoot; [justinwhooten@gmail.com](mailto:justinwhooten@gmail.com)), Central Junior High School, Euless, TX

ELL teachers often find themselves with class sizes that are too large with too few resources. Discover some tricks to make class fun, effective, and manageable.

### Makerspaces—Why, What, How

(Grades P–12)

Birch, Omni

Science Focus: ETS, SEP

**David Vernet** (@dvernot; [dvernot@gmail.com](mailto:dvernot@gmail.com)), Butler County Educational Service Center, Hamilton, OH

I have conducted makerspace activities in diverse settings. I'll cover philosophy, logistics, and resources to promote effective makerspace programs.



### SCST-Sponsored Session: Exploring the Use of Lesson Study to Develop Preservice Teachers' Pedagogical Content Knowledge in Science Teaching

(College)

Hickory, Omni

Science Focus: GEN

**Sandra Lampley**, The University of Alabama in Huntsville  
Review findings from a study exploring the potential that lesson study, a type of teacher professional development, holds for advancing preservice teachers' pedagogical content knowledge in science teaching.

### Creating STEM Middle School to College Pipeline for Underrepresented Students by Partnering High-Needs School Districts with HBCU

(Grades 6–College)

International Ballroom D, Omni

Science Focus: GEN, NGSS

**Melissa Demetrikopoulos** ([mdemetri@BioPhi.org](mailto:mdemetri@BioPhi.org)), Institute for Biomedical Philosophy, Dunedin, FL

**Cynthia Trawick** ([cynthia.trawick@morehouse.edu](mailto:cynthia.trawick@morehouse.edu)) and **Jamie Clayton** ([jamie.clayton@morehouse.edu](mailto:jamie.clayton@morehouse.edu)), Morehouse College, Atlanta, GA

Morehouse College and local high-needs schools have developed a pipeline for underrepresented students spanning grade 6 through college and placement in the STEM workforce.

### NARST-Sponsored Session: Biology Alternative Conceptions and Your Students

(Grades 9–12)

Maple C, South Tower, Omni

Science Focus: LS

**Andria Stammen** ([stammen.52@osu.edu](mailto:stammen.52@osu.edu)), The Ohio State University, Columbus

**Kathy Malone** ([klmalone60@gmail.com](mailto:klmalone60@gmail.com)), Nazarbayev University, Astana, TX

**William Boone** ([boonewj@muohio.edu](mailto:boonewj@muohio.edu)), Miami University, Oxford, OH

Have you always wanted to know what alternative conceptions your students believe in when they step into your secondary classroom? Join us and find out how you can use this new assessment in your classroom to better prepare your lessons. Each participant will have access to the S-BCI and an excel spreadsheet to use for an item analysis of classroom data.

**2:00–3:00 PM Featured Presentation****Premiere of Generation Genius: An Entertaining NGSS Video Series Made in Partnership with NSTA**

(Grades 3–5)

B206, GWCC

Science Focus: GEN, NGSS



**Jeffrey Vinokur** (@JeffreyVinokur; [jeff@generationgenius.com](mailto:jeff@generationgenius.com)), Founder, Generation Genius, Los Angeles, CA

Join Jeffrey Vinokur for the premiere of Generation Genius—a new classroom tool produced in partnership with NSTA that brings the *Next Generation Science Standards* (NGSS) to life

through fun, funny, entertaining, and educational videos. Each 11-minute video comes with a lesson plan, teacher guide, discussion questions, and instructions for a DIY activity. Generation Genius aims to help teachers integrate NGSS into their classroom and spark interest and curiosity in students through the entertainment factor akin to Bill Nye from the 1990s. The videos premiering in this talk are for grades 3–5 and will expand to K–8 in 2019. This presentation includes premiering the videos, a mini live show with Jeffrey Vinokur, and showcasing the supplemental materials, such as the DIY activities. For more information, visit [www.GenerationGenius.com](http://www.GenerationGenius.com).

*Unofficially self-diagnosed with a rare condition called “Mad Scientist Syndrome,” Jeffrey Vinokur has always had a passion for science. In 2017, Jeff received his PhD in biochemistry, molecular, and structural biology from UCLA, but before then...at age 15, he built a homemade chemistry lab...and for his 18th birthday, received an embroidered lab coat. He is a recipient of the National Science Foundation’s Graduate Research Fellowship and a Dean’s Scholar at UCLA.*

*In 2010, Jeff premiered as the Dancing Scientist on Season 5 of NBC’s America’s Got Talent, where he advanced to the Top 100 acts in Las Vegas. Since then, Jeff has made numerous TV appearances, as well as getting audiences of all ages excited about science through live shows and educational videos. Currently, he has over 25 million YouTube views as a hip-hop dancer.*

*Jeff has invented hit science toys found in Toys-R-Us, consults on science shows for Netflix and Fox, and conducts cutting-edge research on biofuels.*

*Jeff is the founder of Generation Genius, a digital library of entertaining videos that integrate the NGSS disciplinary core ideas and include supplementary materials. This talk marks their premiere!*

**2:00–3:00 PM AGU-NESTA Sponsored Lecture Chasing Coral Bleaching: A Present and Growing Ecological Disaster**

(General)

Sidney Marcus Auditorium, GWCC

Science Focus: ESS3, LS

*Sponsored by American Geophysical Union and the National Earth Science Teachers Association*



**C. Mark Eakin** (@MarkEakin; [mark.eakin@noaa.gov](mailto:mark.eakin@noaa.gov)), Coordinator, NOAA Coral Reef Watch, National Oceanic and Atmospheric Administration, Silver Spring, MD

Coral reefs are amazingly beautiful and complex ecosystems that support at least a quarter of all marine species.

However, as ocean temperatures rise, corals have been expelling the algae that give them their color and their food, causing corals to die around the world at a record rate. Reefs have shown us that climate change is impacting nature and people now—it’s not just some far-off problem we can worry about later. Mass coral bleaching is only a 35-year-old problem and it has been increasing in frequency and severity; a gruesome picture painted during the recent three-year global coral bleaching event. The focus of this talk will be on describing this growing problem and its haunting future while attempting to leave you hopeful that we still can save coral reefs before they are all gone. NOAA resources will be shared to understand this essential marine ecosystem, how we study them, and how we can help save them. We’ll also explore a new film, *Chasing Coral* (available on Netflix), that takes students—and everyone else—on a journey to document and understand coral reefs and the problems they face.

*A coral reef specialist, C. Mark Eakin has worked for the National Oceanic and Atmospheric Administration for over 20 years and directs Coral Reef Watch, a program that monitors coral reef ecosystems through satellite and in water observations. He also played a role in developing the International and U.S. Coral Reef Initiatives and the Global Coral Reef Monitoring Network (GCRMN).*

*Mark frequently publishes on coral reef ecology, especially the impact of climate change on coral reefs, coral bleaching, ocean acidification, and coral paleoclimatology. He was a contributing author on the 2014 Intergovernmental Panel on Climate Change Assessment Report and a chief scientific adviser for the film Chasing Coral, which was filmed over three years, with 500+ hours underwater, including footage from over 30 countries.*

## 2:00–3:00 PM Presentations

### Cross-Content Literacy Strategies That Work! Infusing Literacy in the Middle School Science Classroom

(Grades 6–8)

A301, GWCC

Science Focus: GEN, SEP7, SEP8

**Catherine Calogero** ([cacalogero@gmail.com](mailto:cacalogero@gmail.com)), The High-bridge Green School, Bronx, NY

**Daniel O'Shoney** ([doshoney@wcs.org](mailto:doshoney@wcs.org)), Wildlife Conservation Society, Bronx, NY

Hear about successful content-based literacy strategies. Tools, handouts, and student work will be shared, showing that literacy and science can work together!

### Sing for the Planet

(General)

A304, GWCC

Science Focus: GEN

**Juliana Texley** ([@JulianaTexley](mailto:@JulianaTexley); [texlej@cmich.edu](mailto:texlej@cmich.edu)), 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant

The path to the mind goes through the heart. Begin with 14 songs from Pete Seeger, with his Grammy-winning *Fourth Graders*. Look at easy lessons to support the songs. Then enjoy research on positive approaches to environmental education.

### Front and Center STEM: Unifying a K–6 School Around a STEM Curriculum

(Grades K–6)

A401, GWCC

Science Focus: GEN, NGSS

**Marcia Gauvin** ([swimmingwhole@gmail.com](mailto:swimmingwhole@gmail.com)), Woodstock Elementary School, Woodstock, VT

Let me introduce you to the Woodstock Elementary School K–6 STEM Innovation Lab—50 activities, lessons, and resources to put STEM front and center in your school.

### Teaching Literacy Strategies to Enable K–8 Students to Read Science Content with Understanding

(Grades K–8)

A407, GWCC

Science Focus: GEN, NGSS

**Donna Knoell** ([dknoell@sbcglobal.net](mailto:dknoell@sbcglobal.net)), Educational Consultant, Overland Park, KS

Hear about content literacy strategies to enable students to read science text and visuals with understanding, and to communicate concepts, observations, and investigative findings orally and in writing. Handouts.



## STEM Sprouts: STEM for Early Childhood

(Grades P–1)

B211, GWCC

Science Focus: ETS1, SEP1, SEP5

**Steve Coxon** ([@STEMaryville](mailto:@STEMaryville); [coxonsteve@hotmail.com](mailto:coxonsteve@hotmail.com)), Maryville University, St Louis, MO

Early is better—STEM education for ages 3–5 results in long-term benefits as this project demonstrates in a diverse, high-poverty setting.

## Advocating for Science Education

(General)

B309, GWCC

Science Focus: GEN

**Jodi Peterson** ([@stemedadvocate](mailto:@stemedadvocate); [jodi\\_peterson@verizon.net](mailto:jodi_peterson@verizon.net)), Assistant Executive Director, Legislative & Public Affairs, NSTA, Arlington, VA

**Jeffrey Remington** ([@Sci\\_Rem](mailto:@Sci_Rem); [jeff\\_remington@pasd.us](mailto:jeff_remington@pasd.us)), Palmyra Area Middle School, Palmyra, PA

**Julie Olson** ([@KernelSTEM](mailto:@KernelSTEM); [julie.olson@k12.sd.us](mailto:julie.olson@k12.sd.us)), Mitchell High School, Mitchell, SD

**DeLene Hoffner** ([@Colorado\\_CAST](mailto:@Colorado_CAST); [delene.hoffner@asd20.org](mailto:delene.hoffner@asd20.org)), School in the Woods, Colorado Springs, CO

Education is often misunderstood by policymakers. Practitioners, educators, researchers, students, and others in the STEM education community should be on the forefront of advocating for quality science education. In this session, we will take a look at some advocacy techniques to get your message(s) quickly and clearly to federal and state policymakers and thought leaders.



## Engaging Your STEM Ecosystem: A Fishy Success Story

(Grades K–8)

B402, GWCC

Science Focus: LS2.1, LS2.B, INF

**LeeAnne Jimenez** ([@LeeAnnePower](mailto:@LeeAnnePower); [jimenma2@tulsaschools.org](mailto:jimenma2@tulsaschools.org)), Wilson Teaching and Learning Academy, Tulsa, OK

Come learn how Tulsa Public Schools leaders, teachers, and partner organizations collaborated to develop the fifth-grade STEM experience “Something’s Fishy with the Nitrogen Cycle: Designing Aquaponics Systems.”





# Incorporate **STEM** into your classroom with **eCYBERMISSION!**



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

Teams compete for awards up to **\$9,000** per student in  
U.S. Savings Bonds.

Teachers can **APPLY** for **MINI-GRANTS**  
to support implementation of student projects.

Visit booth #1815 for more information on  
eCYBERMISSION and mini-grant applications.



### Controversy in Three Dimensions: Should We Charge More for Sugary Drinks?

(Grades 9–12)

C202, GWCC

Science Focus: LS1.A, LS1.C, LS2.A, LS2.B, CCC2, CCC7, SEP4, SEP6, SEP7, SEP8,

**Dawnne LePretré** ([dlepretr@hawk.iit.edu](mailto:dlepretr@hawk.iit.edu)), **Norman Lederman** ([ledermann@iit.edu](mailto:ledermann@iit.edu)), and **Judith Lederman** ([ledermanj@iit.edu](mailto:ledermanj@iit.edu)), Illinois Institute of Technology, Chicago

**Selina Bartels** ([selina.bartels@cuchicago.edu](mailto:selina.bartels@cuchicago.edu)), Concordia University Chicago, River Forest, IL  
Affecting American health (35% adults/15% children), obesity is a socioscientific issue! Engage students in a debate to produce evidenced-based arguments during a scenario role-play and discussion.

### Scientists Becoming RACERS: Articulating Complex Discoveries

(Grades 5–9)

C207, GWCC

Science Focus: ESS2.D, PS1, SEP1, SEP6, SEP7, SEP8

**Shannon Pylant** ([@nc\\_science\\_girl](mailto:@nc_science_girl); [shannonpylant@gmail.com](mailto:shannonpylant@gmail.com)) and **Leslie Russell** ([mommy.leslie@gmail.com](mailto:mommy.leslie@gmail.com)), Summit School, Winston-Salem, NC

Take the guesswork out of writing argument-driven claims. Our Escape Room scaffolded lesson approach guides building evidence-based explanations from Restating to Rebutting claims.

### How to Design a Hands-On Inquiry Lab for Physics/Physical Science

(Grades 6–12)

C213, GWCC

Science Focus: PS, SEP2, SEP3, SEP4, SEP6

**Christopher Kennedy** and **Peter Fischer**, Hiram High School, Hiram, GA

**Elizabeth Downey**, Allatoona High School, Acworth, GA  
We will walk you through the process that we use to take an idea and develop it into a student-focused inquiry activity.

### Struggling to Teach Chemistry Concepts? Help Is on the Way!

(Grades 6–12)

C301, GWCC

Science Focus: PS1.A, PS1.B

**Susan Rogers** ([rogers340@netetc.com](mailto:rogers340@netetc.com)), Centenary College of Louisiana, Shreveport

Physical science and chemistry teachers—join us to receive materials and activities proven to engage your students and help them understand the content.

### Successful Classroom Strategies for Urban Science Educators

(General)

Grand Ballroom A, Omni

Science Focus: GEN

**Acacia McKenna** ([amckenna@nsta.org](mailto:amckenna@nsta.org)), Director, Competitions, NSTA, Arlington, Va.

**David L. Evans**, NSTA Executive Director, Arlington, VA

**Sherry Blake**, EdGE Empowerment Group, Atlanta, GA

**David Crowther** ([@Dtcrowther](mailto:@Dtcrowther); [crowther@unr.edu](mailto:crowther@unr.edu)), NSTA President, and University of Nevada, Reno

Clinical psychologist and author Dr. Sherry Blake joins special NSTA guests and urban science educators to discuss the current urban science teaching and learning landscape. Be prepared to learn, discuss, and share strategies and scenarios. Geared toward educators in the urban education field, this session will allow thoughtful discussion on lessons learned, ways to enhance the learning environment, and clinically proven methods to ensure your students' success.

### AMSE-Sponsored Session: Unpacking Race in a Science Classroom

(General)

Grand Ballroom C, Omni

Science Focus: GEN

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

**Michael Nocella** ([@mr\\_nocella](mailto:@mr_nocella); [micnoc@d219.org](mailto:micnoc@d219.org)), Niles West High School, Skokie, IL

How does racial identity correspond to or counter that of the content narrative that is commonly shared in our classrooms? What are the implications?

### 100+ Ways to Engage Students!

(Grades 3–12)

International Ballroom C, Omni

Science Focus: GEN

**Jeanette Thomas** ([sjthomas1@fcps.edu](mailto:sjthomas1@fcps.edu)), Langston Hughes Middle School, Reston, VA

Build your “engagement” toolkit! We’ll whip through 100+ strategies for leveraging creativity, novelty, game-play, humor, choice, empathy, pop culture, and more to capture student attention!

### DNA Barcoding: Independent Research for All

(Grades 9–College)

Juniper, Omni

Science Focus: LS1, LS3, LS4, CCC1, CCC2, CCC6, CCC7, SEP1, SEP3, SEP4, SEP6, SEP7, SEP8

**Bruce Nash** ([@DNALC](mailto:@DNALC); [nash@cshl.edu](mailto:nash@cshl.edu)), Dolan DNA Learning Center, Cold Spring Harbor, NY

Engage students in authentic research by identifying organisms through DNA barcoding.

### NSELA-Sponsored Session: Developing a Successful STEM Ecosystem: A Large Urban District's Journey to STEM Achievement

(General)

*Magnolia, Omni*

Science Focus: GEN

**Larry Plank**, Hillsborough County Public Schools, Tampa, FL

Hear about Hillsborough County Public Schools (Tampa, Florida), the eighth largest school district in the nation and one of 54 national STEM Ecosystems recognized by the STEM Funders Network and Samueli Foundation.

### INF Field-Based Professional Development: Fostering Community Engagement and Personal Growth for Teachers and Students

(General)

*Pine (South Tower), Omni*

Science Focus: ESS3.C, INF

**Jeanie Williams** (@otterfern; [jwilliams@schoolship.org](mailto:jwilliams@schoolship.org)), Inland Seas Education Association, Suttons Bay, MI

**Krista Damery** (@Dameryk; [kdamery36@gmail.com](mailto:kdamery36@gmail.com)), CREATE for STEM Institute, Michigan State University, East Lansing

Experience the transformative power of field-based professional development for teacher network building, community engagement, and improving instructional outcomes through student connection to place.

### Launching Cross-District Instructional Resources Through Task Force Processes

(General)

*Walnut, Omni*

Science Focus: GEN, NGSS

**Marina Van der Eb**, University of Maine, Orono

**Beth ByersSmall** ([bbyerssmall@gmail.com](mailto:bbyerssmall@gmail.com)), The Maine Center for Research in STEM Education (RiSE Center), Orono

**Kathleen Dixon-Wallace** ([kdixon-wallace@msad41.org](mailto:kdixon-wallace@msad41.org)), Penquis Valley Middle School, Milo, ME

**Bob Kumpa** ([bobkumpa@gmail.com](mailto:bobkumpa@gmail.com)), Brewer Community School, Brewer, ME

Come learn about a multi-district task force model that can be used to select high-quality, inquiry-based, and standards-focused science instructional resources.

### 2:00–3:00 PM Hands-On Workshops

#### What the Heck Is Global Circulation?! Using Phenomenon-Driven Instruction to Engage Students in 3-D Learning

(Grades 6–8)

*A305, GWCC*

Science Focus: ESS2.D, CCC1, CCC2, CCC4, CCC5, SEP3, SEP4, SEP5

**Candace Penrod** ([cpenrod354@gmail.com](mailto:cpenrod354@gmail.com)), Salt Lake City (UT) School District

**Wendi Laurence** ([wendi@create-osity.com](mailto:wendi@create-osity.com)), Meadowlark Elementary School, Park City, UT

The Atacama Desert is the driest nonpolar desert in the world. Analyze and interpret data and use models of Earth's systems to construct a scientific explanation for this regional climate anomaly.

#### Science and Literacy: Content Area Strategies for Nurturing Young Scientists

(Grades 4–8)

*A316, GWCC*

Science Focus: GEN

**Pam Goodner** ([pamela.goodner@greatminds.org](mailto:pamela.goodner@greatminds.org)), Great Minds Science, Washington, DC

Engage in developmentally appropriate, literacy-based strategies to reinforce key scientific habits of mind, including observation, inquiry, analysis, and the use of text evidence.

#### CESI-Sponsored Session: Transforming and Creating “Predict, Observe, Explain” Sequences for Lower Elementary Science

(Grades 1–6)

*A402, GWCC*

Science Focus: GEN, NGSS

**G. Michael Bowen** ([gmbowen@yahoo.com](mailto:gmbowen@yahoo.com)), Mount Saint Vincent University, Halifax, NS, Canada

**Jim McDonald** (@jimscienceguy; [jim.mcdonald@cmich.edu](mailto:jim.mcdonald@cmich.edu)), CESI President, and Central Michigan University, Mount Pleasant

**Tony Bartley** ([abartley@lakeheadu.ca](mailto:abartley@lakeheadu.ca)), Lakehead University, Thunder Bay, ON, Canada

We will discuss the advantages of POEs, how to modify them from older grades, and provide resources on how to create your own.

### See It All! Explore Science and Engineering Through a Literacy Lens

(Grades K–5)

A405, GWCC

Science Focus: ESS2, ESS3, LS2, PS2, PS3, CCC1, CCC2, CCC3, CCC6, SEP1, SEP6, SEP8

**Anne Mannarino** (@annemannarino; amannarino@regent.edu), Regent University, Virginia Beach, VA

**Elizabeth Edmondson** (ewedmondson@vcu.edu), Virginia Commonwealth University, Richmond

Come explore how you can engage students in science and engineering while using children's literature. Discover ways to develop natural connections between science and literacy.

### Story Starts to STEM: Using Children's Literature to Engage Young Students in STEM

(Grades P–5)

A410, GWCC

Science Focus: GEN, SEP

**Jennifer Williams** (@ScienceJennifer; jenniferwilliams@newmanschool.org), Isidore Newman School, New Orleans, LA Promote your students' enthusiasm and understanding of STEM concepts by integrating children's literature into project-based experiments and activities. Come explore the seamless blend of "story time" and STEM. Leave with a bibliography of suggested titles with coordinating STEM activities.



### NGSS@NSTA Forum Session: Interactions: A Free 3-D Science Curriculum for Ninth-Grade Physical Science

(Grades 9–12)

B102, GWCC

Science Focus: PS1

**Angela Kolonich** (@akolonich; gerberan@msu.edu) and **Leonora Kaldaras**, CREATE for STEM Institute, Michigan State University, East Lansing

**Kristin Mayer** (@mskmayer; kristin.mayer@kentwoodps.org), East Kentwood High School, Grand Rapids, MI

**Daniel Damelin** (@dandamelin; ddamelin@concord.org), The Concord Consortium, Concord, MA

Presider: Ted Willard (twillard@nsta.org), Assistant Executive Director, Science Standards, NSTA, Arlington, VA

Explore how the emergent properties of atoms and molecules provide a foundation for explaining various scientific and everyday phenomena. Using *Interactions* materials, students observe phenomena, engage in hands-on activities, and use online simulations to construct scientific explanations and build explanatory models. Participants will engage in activities and discussions that support the three-dimensional approach of the *Interactions* curriculum.

### NESTA and NOAA Share: Game Design and Game Jams for the Science Classroom

(General)

B103, GWCC

Science Focus: ESS, CCC, SEP

**Peggy Steffen** and **Bruce Moravchik** (bruce.moravchik@noaa.gov), NOAA National Ocean Service, Silver Spring, MD

**Molly Harrison**, NOAA Fisheries, Silver Spring, MD

Don't let the technology teachers have all the fun! Game design can be woven into any science curricula, providing an engaging way for students to learn science content and to creatively apply what they have learned. Find out how to start using game design and game jams in your classroom.



### Engineering Design Notebooks in the Classroom

(Grades 3–8)

B212, GWCC

Science Focus: ETS1, CCC, SEP

**Lindsey Brown** (lindseyannbrown01@gmail.com) and **Amanda Creel** (aussiegal88@gmail.com), Alexander II Magnet School, Macon, GA

Engage students and boost literacy while implementing the Engineering Design Process in your classroom.

### 3D Rethinking Assessment: Strategies for the NGSS Classroom

(Grades 9–12)

B401, GWCC

Science Focus: ESS3.C, ESS3.D, LS1, LS2.A, LS2.B, LS2.C, LS3, LS4, CCC, SEP

**Lesley Shapiro** (shapiro.l@husky.neu.edu), Classical High School, Providence, RI

**Rudolf Kraus** (rkraus@ric.edu), Rhode Island College, Providence

Attention 3-D novices! Expand your assessment portfolio. Come explore the fun and exciting spectrum of assessment possibilities an NGSS classroom has to offer.



### NSTA Press® Session: Picture-Perfect STEM Lessons, K–5

(Grades K–5)

B405, GWCC

Science Focus: GEN, NGSS

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

The authors of *Picture-Perfect STEM Lessons* will share lessons that integrate STEM and literacy through the use of engaging STEM-related picture books.

**Bone Fracture Risk and Big Data***(Grades 9–12)**C201, GWCC*

Science Focus: LS, SEP

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

**Lisa Brosnick** (*lbrosnick@gmail.com*), North Collins Central School, North Collins, NY

Take on the role of medical researchers to collect and analyze data to predict bone fracture risks. Perform simulated lab tests and interpret graphs. Explore how data from various sources could be used to create a “big data” set to provide better evidence for health risk claims. Learn about free online resources from University of Rochester’s “Big Data and Health Science” project.

**Using NASA Data to Enhance Earth Science and Make STEM Connections***(Grades 3–College)**C205, GWCC*

Science Focus: ESS2.D, ESS3, CCC1, CCC2, CCC4, SEP

**Tina Harte** (*tina.r.harte@nasa.gov*) and **Elizabeth Joyner** (*@soyalady*; *elizabeth.r.joyner@nasa.gov*), NASA Langley Research Center, Hampton, VA

Join us as we model the revamped My NASA Data online portal for Earth system science education.

**Heat, Energy, and Matter (CCC5, PS3): An Integrated Grades 3–12 Hands-On Approach Supporting the NGSS and CCSS ELA***(Grades 3–12)**C206, GWCC*

Science Focus: PS1, PS3, CCC5

**Chihche Tai** (*cctai59@gmail.com*), **Karin Keith** (*keithkj@etsu.edu*), and **Renee Moran** (*ricemoran@etsu.edu*), East Tennessee State University, Johnson City

**Gerri St. Clair** (*@gerristclair*; *gerri.stclair@sullivank12.net*), Sullivan South High School, Kingsport, TN

We will offer ideas to build knowledge about using reading and hands-on activities as tools to increase student understanding of heat, energy, and matter.

**Building STEM Knowledge, Practices, and Skills Through Computer Electronic Engineering***(Grades 6–8)**C209, GWCC*

Science Focus: ETS, SEP

**Sanghee Choi** (*schoi@ung.edu*), **Max Vazquez Dominguez** (*max.vazquezdominguez@ung.edu*), **Donna Governor** (*donna.governor@ung.edu*), **Gina Childers**, **Chantelle Renaud-Grant** (*chantelle.grant@ung.edu*), and **Markus Hitz** (*mahitz@ung.edu*), University of North Georgia, Dahlonega

Explore how to use arduino boards and computer coding to explore/develop complex ideas and circuit arrangements according to the students’ interests.

**Death by Hydration: Developing a 3-D Storyline from Modified Old Lessons***(Grades 6–12)**C211, GWCC*

Science Focus: LS1.A, CCC, SEP

**Anna Bahnson** (*agbahnson@gmail.com*) and **Elizabeth Patrick** (*epatrick@oconeeschools.org*), Malcom Bridge Middle School, Bogart, GA

Don’t reinvent the wheel! Learn how we adapted our old osmosis labs to develop a three-dimensional storyline targeting cellular transport and human body systems.

**Geomagnetism—From the Solar Wind to Power System Impacts***(Grades 5–9)**C212, GWCC*

Science Focus: ESS1, ESS3, PS2.A, CCC2, CCC4, CCC5, SEP1, SEP3, SEP4, SEP6

**Jana Sebestik** (*sebestik@illinois.edu*), The University of Illinois at Urbana-Champaign, Champaign

Use mathematics and science practices to investigate relationships between solar weather and electromagnetism. Learn about risks posed to the power grid. Take home classroom materials.

**3-D Learning in High School Physics***(Grades 9–12)**C302, GWCC*

Science Focus: PS2.A, CCC2, SEP3, SEP4, SEP5

**Sarah Eales** (*seeales@gmail.com*), Peachtree Ridge High School, Suwanee, GA

**Kristen Carter** (*kristen\_carter@gwinnett.k12.ga.us*), Archer High School, Lawrenceville, GA

Phenomena-based three-dimensional (3-D) learning is the wave of the future. Come participate in examples of 3-D lessons in a high school physics kinematics unit.





### Engineering to Nurture Biodiversity in a Vacant Lot: 3-D Learning in Urban Schools

(Grades 7–9)

*Dogwood A, Omni*

Science Focus: ETS1, LS2, CCC2, CCC3, SEP

**Lisa Zeller** (@MsZells; lzeller21@gmail.com), World of Inquiry School No. 58, Rochester, NY

Environmental activism motivates three-dimensional learning as it engages youth in using science for authentic work. Participate as learners and collaboratively shape the unit for yourself.

### Leading NGSS Implementation in Districts

(Grades K–12)

*Dogwood B, Omni*

Science Focus: GEN, NGSS

**MaryMargaret Welch** (mmwelch@seattleschools.org), Seattle (WA) Public Schools

Implementation of the new vision for science education is challenging. Join administrators, teacher educators, and researchers as they share their collaborative implementation efforts.

### Excellence Through Self-Efficacy—Engaging the Less Engaged

(Grades P–12)

*Grand Ballroom B, Omni*

Science Focus: GEN, NGSS

**Jodi Zeis** (mrszteachesme@yahoo.com), S2TEM Centers SC, Orangeburg, SC

Engage in purposeful STEM activities and discuss strategies that engage students underrepresented in STEM, including ESOL, special education, and students from high poverty areas.

### Crosscutting Concepts in Your School Yard

(Grades 1–10)

*International Ballroom F, Omni*

Science Focus: GEN, CCC

**Jean Tushie** (jtushie@mediacommbb.net), Eden Prairie High School, Eden Prairie, MN

**Susan German** (@susan\_german; susangermanscienceteacher@gmail.com), Hallsville Middle School, Hallsville, MO

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

**Christine Anne Royce** (@caroyce; caroyce@aol.com), NSTA President-Elect, and Shippensburg University, Shippensburg, PA

**Bev DeVore-Wedding** (@bdevore; bdevorewedding@gmail.com), University of Nebraska–Lincoln

Join a team of science educators demonstrating best practices incorporating crosscutting concepts in the K–12 classroom.

All examples use the outdoors as an overarching theme.

### ASTE-Sponsored Session: Hands-On Performance Assessment of the NGSS: An Effective Formative Assessment Strategy for 3-D Learning

(Grades 3–8)

*Spruce, South Tower, Omni*

Science Focus: GEN, NGSS

**Deborah Tucker** (deborahlt@aol.com), Independent Science Education Consultant, Napa, CA

**Grant Gardner** (@Assessmentserv; grantmgardner@msn.com), Assessment Services, Inc., Pepperell, MA

Engage in a hands-on performance task. Explore how this form of assessment can demonstrate student mastery of three-dimensional learning.

### 2:00–3:00 PM Exhibitor Workshops

#### Science Denial: Where Does It Come From? What Can Science Educators Do About It?

(Grades 9–12)

*B216, GWCC*

Science Focus: GEN, NGSS

Sponsor: Pearson Learning Services

**Joseph Levine**, Author, Boston, MA

**Kenneth Miller**, Brown University, Providence, RI

Science matters. Scientific data and perspectives should help inform economic decisions, guide government policy, and improve health and security. Yet denial and politicization of science is everywhere. Evolution. Climate change. Vaccination. GMOs. We will analyze the causes of science denial, and what science educators can do about it.

**DIVE-in Engineering: New Ideas for the Maker Movement***(Grades 3–8)**B301, GWCC*

Science Focus: ETS, SEP2, SEP6

Sponsor: STEMscopes

**Suzan Morris** ([smorris@acceleratelearning.com](mailto:smorris@acceleratelearning.com)), STEMscopes, Houston, TX

In this interactive and engaging hands-on session, the DIVE Process is investigated, while collaboration and consensus are challenged. Facilitation techniques are modeled. We will build, figure out the process through consensus, and walk away with new maker ideas for the STEM-science classroom with instructional practices true to engineering. Join us and see what it's all about!

**Use Better Models to Teach Protein Synthesis***(Grades 9–12)**B315, GWCC*

Science Focus: LS1.A, LS1.C, CCC1, CCC4, SEP2

Sponsor: PASCO scientific

**Tom Hsu**, PASCO scientific, Roseville, CA

How can students visualize and better understand a molecular level process? We will use molecular models to simulate how information in DNA is expressed in the assembly of proteins from amino acids and conduct simple hands-on activities to help students grasp the fundamentals of molecular biology and protein structure.

**Hands-On: Modeling Ocean Acidification***(Grades 9–12)**B316, GWCC*

Science Focus: LS1.A, LS1.C, CCC1, CCC4, SEP2, ESS3

Sponsor: PASCO scientific

**Roger Palmer**, Bishop Dunne Catholic School, Dallas, TX

How can you make a global phenomenon tangible for students? Through modeling and with data! In hands-on sensor-based investigations, we will monitor local CO<sub>2</sub> levels, model ocean acidification, and use Geographic Information Systems (GIS) to create and explore global datasets with free classroom-ready resources.

**2:00–3:30 PM Hands-On Workshop****Igniting Student Interest in STEM for College and Career Readiness***(Grades K–8)**Maple A/B, South Tower, Omni*

Science Focus: GEN, NGSS

**Wendy Binder**, Project Director, NSTA, Arlington, VA

Come learn and explore effective practices to integrate work-force skills into your STEM lessons from the 2017 Northrop Grumman Foundation Teachers Academy Fellows.

**2:00–3:30 PM Exhibitor Workshops****Smithsonian Engineering: Sending Coded Messages Using Sound***(Grades K–5)**B201, GWCC*

Science Focus: PS

Sponsor: Carolina Biological Supply Co.

**Carolina Teaching Partner**

How can I send a coded message using sound? What causes sound? Engage in engineering your own musical instrument and designing a code to send a message. Experience this new module bringing the best of the Smithsonian to science, engineering, and literacy connections for primary students.

**Protein Necklace: Harnessing the Glow of Jellyfish***(Grades 6–12)**B202, GWCC*

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

**Carolina Teaching Partner**

Illuminate the dark corners of your students' curiosity by teaching them about proteins. This simple classroom exercise allows your students to isolate the green fluorescent protein (GFP) found in jellyfish. Show them that protein science can be tangible and engaging but not overwhelming with this beginner's activity.

**Green Chemistry Experiments for General and AP Chemistry***(Grades 9–College)**B203, GWCC*

Science Focus: PS

Sponsor: Flinn Scientific, Inc.

**Joan Berry** ([jberry@flinnsci.com](mailto:jberry@flinnsci.com)), Flinn Scientific, Inc., Batavia, IL

In collaboration with Beyond Benign, the green chemistry program initiated by the EPA with the goal of applying chemical principles to prevent pollution—we will present unique experiments that demonstrate the 12 principles of green chemistry. You'll learn how to build a solar cell using fruit, make a household surface cleaner, use leftover wood ash from a pizza oven to run an acid-base titration, and use lettuce seeds to study the ecotoxicity of various road deicers. Handouts. Visit [www.flinnsci.com](http://www.flinnsci.com) and [www.beyondbenign.org](http://www.beyondbenign.org) for more information.

### Hands-On Science with Classroom Critters

(Grades K–12)

B204, GWCC

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

#### Carolina Teaching Partner

Add action and excitement to your science class with live organisms! Discover fun, simple hands-on activities with a variety of insects and arthropods that you can use in your labs. Learn about care and handling, as well as easy ways to introduce inquiry. Additional resources available online for your classroom.

### AP Chemistry with Vernier

(Grades 3–College)

B207, GWCC

Science Focus: ETS2, PS1, PS2

Sponsor: Vernier Software & Technology

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

Participate in fun and engaging hands-on experiments using Vernier digital tools to measure intermolecular attractions and gas laws, and explore kinetics and equilibrium using spectroscopy. See how sensor-based experiments teach students about data collection and analysis—practices that promote science inquiry, improve science literacy, and boost test scores.

### Physics with Vernier

(Grades 9–12)

B208, GWCC

Science Focus: ETS2, PS2, PS3, PS4

Sponsor: Vernier Software & Technology

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

Participate in fun and engaging hands-on experiments using the new Go Direct Sensor Cart and other Vernier digital tools. See how sensor-based experiments teach students about data collection and analysis—practices that promote science inquiry, improve science literacy, and boost test scores.

### Engineering Design in the NGSS

(Grades 6–8)

B209, GWCC

Science Focus: ETS1

Sponsor: TCI

**Christy Sanders**, TCI, Mountain View, CA

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

### When Zombies Attack!

(Grades 6–12)

B213, GWCC

Science Focus: ETS, LS, PS, SEP5, SEP6

Sponsor: Texas Instruments

**Jeffrey Lukens**, Sioux Falls (SD) School District

**Fred Fotsch**, Texas Instruments, Dallas

After the apocalypse, you must use any resources available to survive. In this session, survivors will use a little coding (no experience necessary), a simple speaker, and a flashlight to construct a zombie repulsion device. Using the science of sound and hearing, you may just find a way to stop the ZOMBIE ATTACK!

### Science Magazines: Where Literacy Meets Phenomenon-Based Learning

(Grades 3–10)

B214, GWCC

Science Focus: GEN, NGSS

Sponsor: Scholastic Inc.

**Margaret Mead** ([mmead@scholastic.com](mailto:mmead@scholastic.com)) and **Christina Romano** ([cromano@scholastic.com](mailto:cromano@scholastic.com)), Scholastic Inc., New York, NY

**James Brown** ([brownj@scolonie.org](mailto:brownj@scolonie.org)), Sand Creek Middle School, Albany, NY

Scholastic magazine editors and teachers share how engaging articles, curiosity-piquing photos, and DIY challenges can motivate students to think more deeply about science and engineering concepts. Five lucky attendees will win a free class set of magazines.

### Stop Creating Lesson Plans; Start Creating Learning Experiences

(Grades K–12)

B215, GWCC

Science Focus: GEN, NGSS

Sponsor: Van Andel Education Institute

**Randall Schregardus** ([randy.schregardus@vaei.org](mailto:randy.schregardus@vaei.org)) and

**Janyce Huff** ([janyce@vaei.org](mailto:janyce@vaei.org)), Van Andel Education Institute, Grand Rapids, MI

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

### Sustainable and Safe Food and Water for Engaging STEM Students

(Grades 5–College)

B217, GWCC

Science Focus: ESS3.C, LS1.A, LS1.B

Sponsor: University of Delaware Food Science

**Kali Kniel** ([kniel@udel.edu](mailto:kniel@udel.edu)) and **Adrienne Shearer** ([ashearer@udel.edu](mailto:ashearer@udel.edu)), University of Delaware, Newark

The University of Delaware Food Science Program offers science-based educational materials focused on food safety issues applicable across the curriculum. Multifaceted and adaptable resources feature case studies, videos, and web-based games designed for engaging students. Concepts addressed include foodborne illness outbreak investigation and prevention, sustainable agriculture, water conservation, and societal impacts.

### Stream Ecology: Slimy Leaves for Healthy Streams

(Grades 4–College)

B218, GWCC

Science Focus: ESS3.A, LS2.A, SEP3, SEP4, SEP5, SEP8

Sponsor: LaMotte Co.

**Tara Muenz** ([tmuenz@stroudcenter.org](mailto:tmuenz@stroudcenter.org)), Stroud Water Research Center, Avondale, PA

Observe aquatic macroinvertebrate specimens, conduct experiments, learn classification skills, and calculate a biotic index in this hands-on introduction to stream ecology. Come learn from a Stroud Water Research scientist. Takeaways and door prize!

### Developing Models for Sensory Receptors

(Grades 6–8)

B302, GWCC

Science Focus: GEN, NGSS

Sponsor: Delta Education/School Specialty Science—FOSS

**Ann Moriarty** and **Jessica Penchos**, The Lawrence Hall of Science, University of California, Berkeley

Why don't people with visual impairments use their knuckles to read Braille? Use hands-on activities from the new FOSS Next Generation Human Systems Interactions Course for middle school to explore how touch receptors in the nervous system respond to mechanical inputs. Identify connections to the three dimensions of NGSS.

### Are You Crazy About Genetics?

(Grades 6–12)

B303, GWCC

Science Focus: LS

Sponsor: CPO Science/School Specialty Science

**Erik Benton**, CPO Science/School Specialty Science, Nashua, NH

**Kat Mills**, School Specialty Science, Rosharon, TX

Heredity comes alive when you use hands-on models to create crazy creatures in a unique collaborative program using the CPO Science Link Crazy Traits and Crazy Chromosomes modules. Study the relationship between DNA, genes, mitosis, meiosis, traits, alleles, phenotypes, and genotypes with tools everyone is CRAZY about!

### INF Lead a STEM Revolution at Your School with Science Olympiad

(Grades 6–12)

B304, GWCC

Science Focus: INF

Sponsor: Ward's Science

**Jennifer Kopach**, Science Olympiad, Oakbrook Terrace, IL

**Samantha Bonelli**, VWR Science Education, Rochester, NY

Are you ready to start a STEM revolution? Join Ward's Science and Jenny Kopach, executive director of Science Olympiad, to discuss the benefits of starting a Science Olympiad program, learn how to start a team at your school, and practice your building skills with an official Ward's Science Olympiad kit.

### Chemical Formula and Amino Acids

(Grades 9–11)

B305, GWCC

Science Focus: ETS1, PS2.C

Sponsor: Lab-Aids, Inc.

**Brandon Watters**, Vernon Hills High School, Vernon Hills, IL

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

### Changing Perceptions on Climate Change Through Citizen Science and Phenology

(Grades 9–College)

B306, GWCC

Science Focus: ESS3, LS

Sponsor: Fisher Science Education

**Megan Kruger**, West Virginia University Water Research Institute, Morgantown

Have you had trouble teaching about the relevance of climate change in your classroom? Phenology is the study of seasonal phenomena and includes the timing of animal migrations, animal hibernation, leaf development, flower development, insect emergence, and many other things. Changes in phenology of plants and animals provide some of the most robust observations of anthropogenic climate change. Join us to find out how to incorporate phenology education into your classroom!

### BioInteractive Scientists at Work Integrates NGSS Practices!

(Grades 9–12)

B308, GWCC

Science Focus: LS1.A, LS2.A, LS2.B, LS2.C, LS4.C, CCC1, CCC2, CCC4, CCC5, CCC7, SEP1, SEP4, SEP6

Sponsor: HHMI BioInteractive

**Joseph Evans** ([jevans@kent.k12.md.us](mailto:jevans@kent.k12.md.us)), Kent County High School, Worton, MD

**Steven Rogg** ([srogg@cps.edu](mailto:srogg@cps.edu)), Gwendolyn Brooks College Preparatory Academy, Chicago, IL

HHMI BioInteractive's Scientists at Work collection includes stories of authentic science. Engaging personalities, challenging questions, and extraordinary settings stimulate imagination and wonder. These stories, rich with dimensionality, are naturally suited as a foundation for NGSS three-dimensional experiences. Instructional perspective will be shared by veteran teachers. Laptops are welcome, but not required.

### Get That Grant Money!

(Grades 9–College)

B310, GWCC

Science Focus: GEN

Sponsor: Bio-Rad Laboratories

**Leigh Brown**, Bio-Rad Laboratories, Hercules, CA

Successful grant writing isn't rocket science, but it can take your teaching to new heights. We will show you how to get organized and find resources. Experienced grant writers will share their powerful tips to get you to the next level.

### Lab Skills: The Escape Room!

(Grades 9–College)

B311, GWCC

Science Focus: LS

Sponsor: Bio-Rad Laboratories

A mysterious illness renders patients incoherent and a group of field scientists is missing. You must follow the clues to find the cure and solve the mystery in Bio-Rad's lab skills escape room for high school and college life science. Workshop space is limited. Get tickets at the Bio-Rad booth.

### Science Vocabulary Has Kinetic Energy When It's Moving

(Grades K–12)

B312, GWCC

Science Focus: GEN, CCC

Sponsor: McGraw-Hill Education

**Dinah Zike**, [Dinah.com](http://Dinah.com), San Antonio, TX

Make science terms, phrases, formulas, and key concepts kinesthetic and memorable. In this fast-paced hands-on workshop, participants view and make multiple evidence-based and standards-focused Notebook Foldables® and vocabulary manipulatives. Use the materials immediately to enhance daily instruction and organize notebooking activities while providing formative assessment study guides and evaluation tools.

### Elementary Teacher Survival Kit

(Grades 1–8)

B313, GWCC

Science Focus: PS2, PS3.A, PS3.B, PS3.C, SEP1

Sponsor: Educational Innovations, Inc.

**Ken Byrne**, Educational Innovations, Inc., Bethel, CT

**Cathy Byrne**, Hamilton Avenue School, Greenwich, CT

Chock-full of easy-to-do science inquiry lessons, this hands-on workshop enables new and veteran teachers to expand their bag of tricks. Using discrepant events, these activities give students a sense of mystery and awe. Topics include energy, air pressure, scientific investigations, data collection, and graphing. Door prizes and giveaways!

### How to Teach Science with Minecraft

(Grades K–12)

B314, GWCC

Science Focus: GEN, INF

Sponsor: Minecraft Education

**Sara Cornish**, Microsoft, Redmond, WA

Learn how science educators are using Minecraft: Education Edition to teach chemistry, biology, physics, and more. This hands-on workshop will teach you how to play Minecraft and provide sample science lessons for your classroom. Minecraft offers an immersive and engaging learning environment with over 300 free lessons across subject areas.



### Keep Your Head Above Water with Magnetic Water Molecule Models

(Grades 4–College)

B403, GWCC

Science Focus: ESS2, ESS3, ETS, LS1, LS4, PS1, PS2, CCC2, CCC3, CCC4, CCC5, CCC6, CCC7, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP7

Sponsor: MSOE Center for BioMolecular Modeling

**Tim Herman** ([herman@msoe.edu](mailto:herman@msoe.edu)), MSOE Center for Bio-Molecular Modeling, Milwaukee, WI

**Gina Vogt** ([gina.vogt@3dmoleculardesigns.com](mailto:gina.vogt@3dmoleculardesigns.com)), 3D Molecular Designs, Milwaukee, WI

ENGAGE students by modeling chemical and physical properties of water using hands-on/minds-on magnetic water molecules. EXPLORE common water phenomena such as density, erosion, and weathering. EXPLAIN the phases of water density, and solubility. ELABORATE on the water cycle and its impact on the ecosystem. EVALUATE student learning with models.

### Take the Leap into the Frog-Friendly Lab

(Grades 5–College)

B404, GWCC

Science Focus: LS

Sponsor: Animalearn

**Nicole Green** ([ngreen@animalearn.org](mailto:ngreen@animalearn.org)), Animalearn, Jenkintown, PA

Forget about dissection specimens. Join Animalearn as we explore the latest nonanimal methods. This workshop provides hands-on experience with alternatives! One attendee will win a prize valued at \$299!

## “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 Retiring:  
Suggestions and Help**  
**Saturday, March 17**  
**9:30–10:30 AM**

Omni Atlanta Hotel at CNN Center  
Chestnut

For more information on the Retired Members Advisory Board, contact Lloyd Barrow, Chair, at [barrowl@missouri.edu](mailto:barrowl@missouri.edu).

**NSTA** National  
Science  
Teachers  
Association

## Make Science Relevant and Engaging Featuring a Mobile Data Logger

(Grades 4–12)

B406, GWCC

Science Focus: ETS

Sponsor: PowerUpEDU

**Dovi Bruker**, Globisens, Ra'anana, Israel

**Barrie Smith**, Boxlight/Mimio, Lawrenceville, GA

**Donald White**, Coweta County School System, Newnan, GA

**Regina Ahmann**, East Coweta High School, Sharpsburg, GA

**Gail Lambert**, PowerUpEDU, Kennesaw, GA

Students most effectively acquire and retain information when it reflects the reality they experience outside the classroom. Using a mobile data logger like Labdisc to ensure mobility, science experiments can be performed anywhere. Find out how easy, fun, and flexible this data logger can be for collaborative project-based learning. Actual case study will be presented by Coweta County educators.

## Crash Science Website Launched! Free STEM Activities, Videos, and More

(Grades 5–12)

B407, GWCC

Science Focus: GEN

Sponsor: Insurance Institute for Highway Safety

**Pini Kalnite** ([pkalnite@iihs.org](mailto:pkalnite@iihs.org)), Insurance Institute for Highway Safety, Arlington, VA

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

Discover how the new *IIHS in the Classroom* website helps students and teachers explore crash safety science in grades 5–12 classrooms with dramatic crash-testing videos, behind-the-scenes crash research facility tours, and complete inquiry-based, hands-on crash science lessons, demonstrations, teaching tips, and more. All resources are downloadable and free. Prizes and giveaways.

## Bringing the World into Your Classroom with National Geographic Explorers

(Grades K–5)

B408, GWCC

Science Focus: GEN

Sponsor: National Geographic Learning | Cengage

**Pam Caffery** ([pam.caffery@cengage.com](mailto:pam.caffery@cengage.com)), National Geographic Learning | Cengage, Boston, MA

Your students will be inspired when they connect with National Geographic Explorers and National Geographic Learning! Discover great ideas on how to use National Geographic Learning's program and the Explorers to bring real-world exploration to the classroom.

## 2:30–3:00 PM Presentations

### INF Building the Bond Through Family Engagement and Informal Learning

(Grades P–8)

C203, GWCC

Science Focus: INF, SEP1

**Candyce Johnson** ([cjohnson@bbg.org](mailto:cjohnson@bbg.org)) and **Lauren Bell** ([laurenbell@bbg.org](mailto:laurenbell@bbg.org)), Brooklyn Botanic Garden, Brooklyn, NY

Build your strategy toolbox for empowering families to feel comfortable engaging with STEM learning through informal learning opportunities in their communities and own backyards.

### Classroom Objectives That Impact Student Learning

(Grades 6–12)

C204, GWCC

Science Focus: GEN

**Brenda Hubbard** ([brenda.hubbard@jpps.k12.la.us](mailto:brenda.hubbard@jpps.k12.la.us)), Riverdale High School, New Orleans, LA

Receive research-based strategies to help write objectives that will impact learner outcomes for English language learners and SPED students.

### A School Makerfaire for All

(General)

Birch, Omni

Science Focus: GEN

**Samantha Levine** (@Sciencediva14; [sdd131424@yahoo.com](mailto:sdd131424@yahoo.com)), South Orangetown Central School District, Blauvelt, NY

**Brian Newburger** ([bnewburger@socsd.org](mailto:bnewburger@socsd.org)), Tappan Zee High School, Orangeburg, NY

Revamp that science fair for 21st-century learning. Come hear how we plan, promote, and run a K–12 STEAM Expo where students get to show off their projects to the community.

### SCST-Sponsored Session: Analyzing Critical-Thinking Patterns and Decision-Making Processes Using the Online Platform Finding QED

(College)

Hickory, Omni

Science Focus: GEN

**Joseph Trackey** ([joseph.l.trackey@lonestar.edu](mailto:joseph.l.trackey@lonestar.edu)) and **Helen McDowell** ([helen.e.mcdowell@lonestar.edu](mailto:helen.e.mcdowell@lonestar.edu)), Lone Star College–Montgomery, Conroe, TX

We will highlight the thinking strategies and decision-making processes used by introductory college biology students using an innovative online platform, Finding QED.

### NARST-Sponsored Session: Uncovering Secondary Students' Alternative Conceptions in Biology

(Grades 9–12)

Maple C, South Tower, Omni

Science Focus: LS3

**Andria Stammen** ([stammen.52@osu.edu](mailto:stammen.52@osu.edu)), The Ohio State University, Columbus

**Kathy Malone** ([klmalone60@gmail.com](mailto:klmalone60@gmail.com)), Nazarbayev University, Astana, TX

**William Boone** ([boonewj@muohio.edu](mailto:boonewj@muohio.edu)), Miami University, Oxford, OH

Have you always wanted to know what alternative conceptions your students have when they step into your secondary biology classroom? If so, join us as we discuss how the Secondary Biology Concept Inventory (S-BCI) can be used to identify students' alternative conceptions in biology. Come gain access to a digital link to the S-BCI, which includes a description of the constructs and alternative conceptions measured by the S-BCI.

### 2:30–4:30 PM Hands-On Workshop

#### Meet Me in the Middle Session: Middle Level Share-a-Thon

(Grades 3–8)

A411/412b, GWCC

Science Focus: GEN

Organizer: **Todd Hoover** ([@DrToddHoover](mailto:@DrToddHoover); [thoove2@bloomu.edu](mailto:thoove2@bloomu.edu)), Bloomsburg University of Pennsylvania, Bloomsburg

Visit [bit.ly/2m5gcDU](http://bit.ly/2m5gcDU) for a complete list of participants.

Join us to engage in hands-on activities, collect information/resources from national/international organizations, network with NSTA Middle Level and NMLSTA leaders, review recommended middle level science materials and resources, and more, all in a single location. Attend this session and discover invaluable resources that will engage your middle level students in exciting and inspiring science learning!

### 3:00–4:00 PM Meeting

#### Chapter and Associated Group Leader Roundtable

Hazelnut, Omni



### 3:00–4:30 PM Exhibitor Workshop

#### Explore Renewable Energy with Hands-On Activities

(Grades 4–8)

B409, GWCC

Science Focus: ETS, PS3

Sponsor: LEGO Education

**Laura Jackson**, Retired Science Teacher, Lee's Summit, MO

Discover how to engage your students' kinesthetic senses while teaching them the importance of renewable energy. This workshop is designed for educators looking to teach renewable energy sources such as solar, wind, and hydro energy in an engaging, hands-on way.

### 3:00–6:00 PM Short Course

#### 3D Putting the Pieces Together: Introduction and Implementation of 3-D Learning (SC-9)

(Grades K–12)

Tickets Required; \$25

Chastain H, Westin

Science Focus: GEN

**Donna Joy Barrett-Williams** ([@donna-science](mailto:@donna-science); [williamsd17@fultonschools.org](mailto:williamsd17@fultonschools.org)), **Angela Hope Ergle** ([@ergle\\_angela](mailto:@ergle_angela); [ergle@fultonschools.org](mailto:ergle@fultonschools.org)), **Amy Kilbride** ([kilbride@fultonschools.org](mailto:kilbride@fultonschools.org)),

**Chanel Johnson** ([johnsondc@fultonschools.org](mailto:johnsondc@fultonschools.org)), and **Nyasha Okor**, Fulton County Schools, Atlanta, GA

**Nicole Lynn Ford** ([@STEMSLC](mailto:@STEMSLC); [fordn@fultonschools.org](mailto:fordn@fultonschools.org)), Fulton County Schools South Learning Center, Union City, GA

For description, see Volume 1, page 60.

### 3:30–4:00 PM Presentations

#### A River Story: Expanding Science Access to Urban Second Graders and Their Teachers

(Grades P–5)

A401, GWCC

Science Focus: ESS2.A, ESS2.C, ETS1, CCC2, CCC7

**Sarah Sterling-Laldee** ([patersonstem@gmail.com](mailto:patersonstem@gmail.com)) and **Elizabeth Nunez** ([nunezelizabeth0218@yahoo.com](mailto:nunezelizabeth0218@yahoo.com)), Paterson (NJ) Public Schools

**Nakeia Wimberly** ([ms.nakeiawimberly@gmail.com](mailto:ms.nakeiawimberly@gmail.com)) and **Norma Menchon** (@MenchonNorma; [nmenchon@ppsstaff.org](mailto:nmenchon@ppsstaff.org)), Paterson School No. 2, Paterson, NJ

Find out how community partners worked with an urban district to enhance training opportunities for grade 2 teachers and to support three-dimensional science learning for ALL of their students.



#### Laser Cutters + 3D Printers + Vinyl Cutters = Bolstered K–3 Math Curriculum

(Grades K–3)

A408, GWCC

Science Focus: ETS

**Ryan Erickson**, Cedar Park Elementary STEM School, Apple Valley, MN

The maker movement is spreading across the country. Laser cutters, 3D printers, vinyl cutters, and more are starting to show up in elementary schools. Encounter simple ways to connect the maker movement, 3D printers, laser cutters, and vinyl cutters to K–3 math standards.



#### Creating Opportunities to Capitalize on Literacy for Sense-Making in K–5 Science

(Grades K–5)

B212, GWCC

Science Focus: GEN, NGSS

**LeeAnna Hooper** ([lahooper412@gmail.com](mailto:lahooper412@gmail.com)), Penn State, University Park, PA

**Julie Eye** ([juliebunch1@gmail.com](mailto:juliebunch1@gmail.com)), Patterson International, Denver, CO

Discover ways to capitalize on literacy practices to promote sense-making in K–5 science instruction.

#### ASTE-Sponsored Session: Using Web GIS and iPads for Socio-Environmental Science Investigations

(Grades 6–College)

Maple C, South Tower, Omni

Science Focus: LS2, CCC1, SEP3, SEP4

**Alec Bodzin** ([amb4@lehigh.edu](mailto:amb4@lehigh.edu)), Lehigh University, Bethlehem, PA

**Kate Popejoy** ([popejoyphd@gmail.com](mailto:popejoyphd@gmail.com)), Da Vinci Science Center, Whitehall, PA

We will present new student learning activities that use web GIS and iPads to investigate local socio-environmental issues.

#### Building Community and Cultivating Success in STEM Through the Women in Science & Engineering (WiSE) Program at the University of Nevada, Reno

(Grades 10–College)

Pine (South Tower), Omni

Science Focus: GEN

**Tara Langus** ([tlangus5@nevada.unr.edu](mailto:tlangus5@nevada.unr.edu)), University of Nevada, Reno

See how yearlong immersion in a Living Learning Community can increase the recruitment and retention of women in STEM through service learning and professional development.



**3:30–4:30 PM Featured Presentation****Engaging All Students in Science**

(General)

B309, GWCC

Science Focus: GEN, NGSS

*Sponsored by Shell*

**Okhee Lee** (@LeeOl16; [olee@nyu.edu](mailto:olee@nyu.edu)), Professor of Childhood Education, Steinhardt School of Culture, Education, and Human Development New York University, New York, NY

Presider: Steve Rich, Strand Leader, NSTA Atlanta National Conference, and University of West Georgia, Carrollton

There is broad consensus on the vision of academically rigorous science learning with all students to be ready for college and careers in STEM fields. This vision coincides with the rapidly growing student diversity in the nation...hence, “all standards, all students.” As the NGSS begin to take hold in schools and classrooms across the nation, it is critically important that science educators are prepared for classroom implementation. Okhee will present NGSS-focused instructional materials for diverse student groups, including English language learners.

*Okhee Lee is a professor in the Steinhardt School of Culture, Education, and Human Development at New York University. Her research areas include science education, language and culture, and teacher education. She is currently leading collaborative research between New York University and Stanford University to develop instructional materials aligned with the Next Generation Science Standards in order to support science learning and language development of elementary students including English language learners.*

*Okhee was a member of the NGSS writing team and served as leader for the NGSS Diversity and Equity Team. She was also a member of the Steering Committee for the Understanding Language Initiative at Stanford University. A 2009 Fellow of the American Educational Research Association (AERA), Okhee received the Distinguished Career Award from the AERA Scholars of Color in Education in 2003, and was awarded a 1993–1995 National Academy of Education Spencer Postdoctoral Fellowship.*

**3:30–4:30 PM Meeting****GSTA Annual Meeting**

(By Invitation Only)

Juniper, Omni

**3:30–4:30 PM Presentations****NARST-Sponsored Session: I AM STEM: Transforming the Face of STEM One Community at a Time**

(General)

A301, GWCC

Science Focus: GEN, NGSS

**Natalie King** (@drnatalieking; [natalieking@gsu.edu](mailto:natalieking@gsu.edu)), Georgia State University, Atlanta

Emphasis will be placed on research-based strategies to successfully design and implement STEM programs for K–12 students by leveraging community and university resources.

**NGSS for All Learners Using 4-Part Performance Tasks**

(Grades 6–8)

A303, GWCC

Science Focus: GEN, NGSS

**Cari Williams** (@CariWilliamz; [cariw369@gmail.com](mailto:cariw369@gmail.com)), Tustin (CA) Unified School District

Come learn how to implement and design 4-Part Performance Tasks to help all students find success with the NGSS. Curriculum will be shared.

**STEM and Trade Books: Strange Bedfellows**

(Grades P–8)

A304, GWCC

Science Focus: GEN

**J. Carrie Launius** (@janetcarrie; [janetcarrie@gmail.com](mailto:janetcarrie@gmail.com)), NSTA Director, District XI, Saint Louis, MO

**Emily Brady** ([ebrady@nsta.org](mailto:ebrady@nsta.org)), Director, Special Projects, Content, NSTA, Arlington, VA

**Juliana Texley** ([texlelj@cmich.edu](mailto:texlelj@cmich.edu)), 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant

**Carla Billups** (@cmbillups; [cmbillups12@gmail.com](mailto:cmbillups12@gmail.com)), Buncombe County Schools, Asheville, NC

Wondering how to add literacy to your STEM lessons? Come learn about NSTA's initiative Best STEM Books and how to identify and integrate them.



### Scaffolding the Crosscutting Concepts: Tools for 3-D Thinking in Middle School

(Grades 6–8)

A311, GWCC

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

**Jeremy Peacock** (@jeremy\_peacock; [peacock.jeremy@gmail.com](mailto:peacock.jeremy@gmail.com)), Program Coordinator, NSTA Atlanta National Conference, and Northeast Georgia RESA, Winterville

**Amy Peacock** ([peacocka@clarke.k12.ga.us](mailto:peacocka@clarke.k12.ga.us)), Clarke County School District, Athens, GA

**Jessica Caldwell** (@MrsJessiLynn; [mrsjlcaldwell@gmail.com](mailto:mrsjlcaldwell@gmail.com)), Oglethorpe County Middle School, Lexington, GA

**Meganne Butler** ([butlerme@clarke.k12.ga.us](mailto:butlerme@clarke.k12.ga.us)), Hilsman Middle School, Athens, GA

**Katrina Holt** ([katmh1016@gmail.com](mailto:katmh1016@gmail.com)), Commerce (GA) City Schools

Middle school teachers share how they use graphic organizers to scaffold and gather evidence of student thinking as they apply the crosscutting concepts to phenomena.

### Trips and Treks: Teaching Endangered Species Through Literature

(Grades 4–8)

A407, GWCC

Science Focus: ESS3.C, SEP1, SEP6

**Renee' Lyons** ([lyonsrc@etsu.edu](mailto:lyonsrc@etsu.edu)), East Tennessee State University, Johnson City

Are you eager to inspire the next Jacques Costeau? Discover how specific Sibert and Orbis Pictus Award winners are used in science-based lessons and activities.

### Bring the Ocean into Your Classroom with National Marine Sanctuaries

(General)

A412a, GWCC

Science Focus: ESS2, ESS3

**Claire Fackler** (@sanctuaries; [claire.fackler@noaa.gov](mailto:claire.fackler@noaa.gov)), NOAA Office of National Marine Sanctuaries, Santa Barbara, CA

Learn about free STEM educational resources and hands-on field experiences to increase ocean and climate literacy with your students. Receive free materials!

### Engineering Through Aquaculture Technology for Women

(Grades 5–College)

C202, GWCC

Science Focus: LS

**Lovelle Ruggiero** ([lovelleruggiero@mac.com](mailto:lovelleruggiero@mac.com)), Consultant/Content Specialist, New Rochelle, NY

Recirculating aquaculture (fish farming) could be an indirect way to introduce engineering to women and underserved populations, while addressing scientific concepts and engineering practices.

### Controversy in Three Dimensions: Should the HPV Vaccine Be Mandatory?

(Grades 9–12)

C204, GWCC

Science Focus: ETS1.B, CCC2, SEP4, SEP6, SEP7, SEP8

**Dawnne LePretré** ([dlepretr@hawk.iit.edu](mailto:dlepretr@hawk.iit.edu)), **Norman Lederman** ([ledermann@iit.edu](mailto:ledermann@iit.edu)), and **Judith Lederman** ([ledermanj@iit.edu](mailto:ledermanj@iit.edu)), Illinois Institute of Technology, Chicago

Affecting over 80 million Americans, HPV is a socioscientific issue! Engage students in a debate to produce arguments supported by evidence during a scenario role-play and discussion.

### Incorporating NGSS in Transdisciplinary Project-Based Learning

(Grades 6–12)

C207, GWCC

Science Focus: GEN, SEP1, SEP6, SEP8

**Amy Foley** (@foley\_amy; [amy.foley@saschina.org](mailto:amy.foley@saschina.org)), Shanghai American School, Puxi Campus

Transdisciplinary learning engages students while they collaborate, communicate, and think critically and creatively. A framework, project overviews, and sample rubrics for integrated Project-Based Learning provided.

### Integrating Literacy with Science Content to Develop Viable Solutions to Existing Worldwide Problems

(Grades 7–12)

C213, GWCC

Science Focus: ESS3, LS2

**Elizabeth Kirman** (@BethKirman; [ekirman@ldsd.org](mailto:ekirman@ldsd.org)), Lower Dauphin High School, Hummelstown, PA

Hear about a collaboration between teacher and instructional coaches that used student choice, environmental science content, scaffolding, multimedia, and literacy skills.

### EnergyWhiz: Engaging Underserved Students as Energy Problem-Solvers

(Grades 4–12)

C301, GWCC

Science Focus: PS3, SEP

**Susan Schleith** ([susan@fsec.ucf.edu](mailto:susan@fsec.ucf.edu)) and **Penny Hall** ([penny@fsec.ucf.edu](mailto:penny@fsec.ucf.edu)), Florida Solar Energy Center, Cocoa

**Malcolm Butler** (@malcolmbutler; [mbbutler1965@yahoo.com](mailto:mbbutler1965@yahoo.com)), University of Central Florida, Orlando

Energy choices impact us all. Discover how a hands-on program (EnergyWhiz) can excite and engage students to be confident energy problem-solvers.



—Photo courtesy of Mike Weiss

### Got Tech? Now What? Using Technology for Formative Assessment

(Grades 9–11)

*Dogwood A, Omni*

Science Focus: GEN, NGSS

**Jean Tushie** ([jtushie@mediacommbb.net](mailto:jtushie@mediacommbb.net)), Eden Prairie High School, Eden Prairie, MN

**Brenda Walsh** ([@brendajwalsh](mailto:@brendajwalsh); [bwalsh@edenpr.org](mailto:bwalsh@edenpr.org)), NSTA Director, District IX, and Eden Prairie High School, Eden Prairie, MN

We will share different applications of technology that we use for formative assessments. Discussion centers on the pros and cons of several different digital formative assessment formats, such as socrative, kahoot, quizlet, nearpod, popplet, schoology, and more.

### Develop Three-Dimensional Assessments for NGSS Performance Expectations

(Grades 3–12)

*Dogwood B, Omni*

Science Focus: GEN, NGSS

**Crystal Caouette** ([crystal@snet.net](mailto:crystal@snet.net)), Safety Education & Consulting Services, LLC, Wolcott, CT

View three-dimensional assessments to monitor student achievement of the NGSS performance expectations. Discuss the resources/protocols used and compare these strategies to the development of state assessments.

### The Top Ten Safety Issues in the Science Classroom/Laboratory You Need to Know!

(General)

*International Ballroom C, Omni*

Science Focus: GEN, SEP2, SEP3

**Mary Loesing** ([mloesing@ccsdli.org](mailto:mloesing@ccsdli.org)), NSTA Director, District IV, and Connetquot Central School District, Bohemia, NY

**Kenneth Roy** ([@drroysafersci](mailto:@drroysafersci); [royk@glastonburyus.org](mailto:royk@glastonburyus.org)), Glastonbury (CT) Public Schools

**Edward McGrath** ([@eddiesciguy](mailto:@eddiesciguy); [edward.mcgrath@redclay.k12.de.us](mailto:edward.mcgrath@redclay.k12.de.us)), Red Clay Consolidated School District, Wilmington, DE

Every science teacher wants their students to be engaged in a safer working/learning environment. Members of the NSTA Safety Advisory Board will discuss important issues in lab safety such as occupancy loads, chemical storage and disposal, field trip safety, and duty of care.

### NSELA-Sponsored Session: Developing and Exploring a Culture of STEM

(General)

*Magnolia, Omni*

Science Focus: GEN

**Jonathan Gerlach**, Discovery Education™, Silver Spring, MD

STEM is a culture of teaching and learning that, when effective, permeates throughout a classroom, school, and community.

### AMSE-Sponsored Session: Hands On and Easy—Stimulate Learning for Diverse Learners

(Grades 5–9)

*Spruce, South Tower, Omni*

Science Focus: GEN, SEP

**Charles Cheng**, Llongwill Digital USA, Houston, TX  
 Presider: Sharon Delesbore, AMSE President, and Fort Bend ISD, Rosharon, TX

Our mission is to make real-world connections to STEM education through the use of data-collecting sensors and teacher collaboration to enhance technology.

### 3:30–4:30 PM Hands-On Workshops

#### Analysis of Supernova Remnants Using X-Ray Spectroscopy with NASA Data and STEM Tools

(Grades 9–12)

A302, GWCC

Science Focus: ESS1.A, PS1.B, PS1.C, PS2.C, PS4.B, PS4.C, SEP4, SEP7

**Pamela Perry** ([pperry@lewistonpublicschools.org](mailto:pperry@lewistonpublicschools.org)), Lewiston High School, Lewiston, ME

**Donna Young** ([dlyoung.nso@gmail.com](mailto:dlyoung.nso@gmail.com)), NASA NSO STEM Coordinator, Bullhead City, AZ

Identify elements in the spectra of supernova remnants to determine the properties of collapsed and exploded stars using NASA X-ray data and image analysis tools.

#### Cloudy with a Chance of...SCIENCE!

(Grades 7–11)

A305, GWCC

Science Focus: ESS2.D

**Mauree Haage** ([@MAHaage](mailto:@MAHaage); [mauree.haage@gmail.com](mailto:mauree.haage@gmail.com)), Twin Cedars Community School District, Bussey, IA

Discover how to make meteorology a hands-on experience that is also a three-dimensional learning experience.

#### ASTC-Sponsored Session: Designing the World: Engineering Design Through a Historical Lens

(Grades 1–12)

A312, GWCC

Science Focus: ETS1

**Jennifer McIntosh** ([mcintoshj@si.edu](mailto:mcintoshj@si.edu)), Smithsonian National Air and Space Museum, Chantilly, VA

**Jennifer Elliott** ([@oftencalledjen](mailto:@oftencalledjen); [jelliott@intrepidmuseum.org](mailto:jelliott@intrepidmuseum.org)), Intrepid Sea, Air & Space Museum, New York, NY

Engineering design is nothing new! From early aviation to the Space Race and beyond, see how history meets science in order to push society onward.

#### Understanding the Local Watershed Through Investigations and Literature

(Grades 3–6)

A313, GWCC

Science Focus: ESS3

**Christine Anne Royce** ([@caroyce](mailto:@caroyce); [caroyce@aol.com](mailto:caroyce@aol.com)), NSTA President-Elect, and Shippensburg University, Shippensburg, PA

Dive into intermediate grade investigations that help explore the watersheds and water quality. Activities are paired with literature-based connections for integrated learning opportunities.

#### Moon Madness

(Grades 4–9)

A315, GWCC

Science Focus: ESS1, CCC, SEP

**Leesa Hubbard** ([@AstroJasper](mailto:@AstroJasper); [AstroPoet@aol.com](mailto:AstroPoet@aol.com)), Southside K–8 School, Lebanon, TN

If you teach about the Moon, you are guaranteed to leave this session with something new! Activities will include the use of models and maps, and cover integration across the curriculum.

#### STEMgenuity

(Grades K–8)

A316, GWCC

Science Focus: ETS, PS, CCC4, SEP

**Cheryl Sundberg** ([sundbergc@bellsouth.net](mailto:sundbergc@bellsouth.net)), Educational Consultant, Millbrook, AL

Explore scientific inquiry, engineering design, and emerging technologies in this hands-on/minds-on workshop for K–8 teachers with easy-to-find, safe materials from local grocery or hardware store. Learn to design three-dimensional models using simple, inexpensive, and readily available materials. Session includes sample lessons created specifically for elementary/middle grades and sample materials suitable for STEM kits.

#### Justifying Predictions About Energy Transfer: Students' Use of Evidence and Reasoning in 3-D Learning

(Grades 3–5)

A402, GWCC

Science Focus: PS3.B, CCC, SEP7

**Anna Maria Arias** ([aarias588@gmail.com](mailto:aarias588@gmail.com)), Illinois State University, Normal

**Sarah Fick** ([@SarahJFick](mailto:@SarahJFick); [ficksj@wfu.edu](mailto:ficksj@wfu.edu)), Wake Forest University, Winston-Salem, NC

We will discuss strategies for supporting and assessing students in justifying their predictions about energy transfer. This facilitates scientific argumentation for three-dimensional learning.

#### Transforming the “Oldies”: Make Phenomena and Modeling Inspire Your Next Generation Learners

(Grades K–6)

A403, GWCC

Science Focus: ETS, PS, CCC1, CCC2, CCC4, SEP1, SEP2, SEP4, SEP6, SEP7

**Mary Stein** ([stein@oakland.edu](mailto:stein@oakland.edu)) and **Betty Crowder** ([@bjc913](mailto:@bjc913); [crowder@oakland.edu](mailto:crowder@oakland.edu)), Oakland University, Rochester, MI

Take the old and make it new again! Tried-and-true activities are transformed into experiences that engage students in real-world phenomena, scientific discussion, modeling, and wonder.



### NGSS@NSTA Forum Session: How Can Light Help Me See and Communicate with Others? A Storyline Designed to Support 3-D Learning in an Early Elementary Classroom

(Grades K–12)

B102, GWCC

Science Focus: ETS1, PS4

**Brian Reiser** (@reiserbrianj; [reiser@northwestern.edu](mailto:reiser@northwestern.edu)) and **Tara McGill** (@tarantulamarch; [taraawmcgill@gmail.com](mailto:taraawmcgill@gmail.com)), Northwestern University, Evanston, IL

**Brendan Vaughan** ([brendanthomasvaughan@gmail.com](mailto:brendanthomasvaughan@gmail.com)) and **Sara Ivory** (@saraschneeberg; [sarafayeivory@gmail.com](mailto:sarafayeivory@gmail.com)), The Ogden International School of Chicago, East Campus, Chicago, IL

Presider: Ted Willard ([twillard@nsta.org](mailto:twillard@nsta.org)), Assistant Executive Director, Science Standards, NSTA, Arlington, VA

Discover how this storyline can be used to engage students in three-dimensional learning in elementary classrooms. The storyline targets six NGSS performance expectations in physical science and engineering. Participants will be immersed in the anchoring phenomenon that kicks off the unit, analyze the design challenges and investigations that are motivated by students' own questions, and investigate student work and classroom artifacts from first-grade pilots. This unit is available via open-source, freely accessible resources provided by [www.nextgenstorylines.org](http://www.nextgenstorylines.org).

### NESTA and PolarTREC Earth System Science Share-a-Thon

(Grades K–12)

B103, GWCC

Science Focus: ESS2, ESS3, CCC4, SEP

**Deanna Wheeler**, J.C. Parks Elementary School, Indian Head, MD

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

### 3D Phenomenal Mysteries and Probes in Science

(Grades K–5)

B401, GWCC

Science Focus: ESS1, ESS2.A, PS2, PS4

**Tonya Woolfolk** ([tonya.woolfolk@hcb.net](mailto:tonya.woolfolk@hcb.net)), **Kristen Brooks** ([kristen.brooks@hcb.net](mailto:kristen.brooks@hcb.net)), **Kristina Cummings** ([kristy5223@gmail.com](mailto:kristy5223@gmail.com)), **Dora Waite**, **Kimberly Stephens** ([kimberly.stephens@hcb.net](mailto:kimberly.stephens@hcb.net)), and **Kolenda McDavis** ([kolenda.mcdavis@hcb.net](mailto:kolenda.mcdavis@hcb.net)), Houston County School District, Perry, GA

**Amy Materne** ([amy.materne@hcb.net](mailto:amy.materne@hcb.net)), Russell Elementary School, Warner Robins, GA

Learn how teachers use science mysteries as phenomena for three-dimensional lessons. The science mysteries coupled with formative assessment probes uncover student thinking and guide learning.



### Sliders, Blocks, Fences, and Mazes: Kindergarten Physics and Engineering

(Kindergarten)

B402, GWCC

Science Focus: ETS1.B, ETS1.C, PS2.A, PS2.B, CCC2, CCC6, SEP4, SEP6, SEP7

**Pamela Lottero-Perdue** ([plottero@towson.edu](mailto:plottero@towson.edu)) and **Cody Sandifer** ([csandifer@towson.edu](mailto:csandifer@towson.edu)), Towson University, Towson, MD

Get engaged in an NGSS-focused kindergarten mini-unit that includes two 5E physics lessons and two engineering challenges. Challenges use building blocks and bug-like mini-robots.



### NSTA Press® Session: Everyday Engineering

(Grades 4–10)

B405, GWCC

Science Focus: ETS, SEP

**Richard Moyer**, Professor Emeritus, University of Michigan–Dearborn

Participate in 5E engineering activities that look at the design of those things we all use everyday—ball point pens, zip-lock baggies, ear buds, and baseball bats. Activities such as these show students the human side of engineering.

### Using Authentic Biodiversity Data from Natural History Collections in Your Classroom

(Grades 6–12)

C205, GWCC

Science Focus: LS2.A, LS4, CCC1, CCC2, SEP4, SEP8

**Molly Phillips** (@iDigBio; [mphillips@flmnh.ufl.edu](mailto:mphillips@flmnh.ufl.edu)) and

**Jeanette Pirlo** (@paleoteach; [jpirlo@flmnh.ufl.edu](mailto:jpirlo@flmnh.ufl.edu)), Florida Museum of Natural History, Gainesville

**Kathryn Green** ([kegreen4@ncsu.edu](mailto:kegreen4@ncsu.edu)), North Carolina State University, Raleigh

**Adania Flemming** (@adanianscience; [aflemming@ufl.edu](mailto:aflemming@ufl.edu)), University of Florida/iDigBio, Gainesville

We will demonstrate how to access free online biodiversity data and walk you through an NGSS-focused lesson that allows students to investigate conservation issues with real data.

### Engineering Design Journals: Trials and Tribulations

(Grades 6–College)

C206, GWCC

Science Focus: ETS, PS, SEP

**Kristin Newton** ([knewton@cpsd.us](mailto:knewton@cpsd.us)), Cambridge Rindge and Latin School, Cambridge, MA

**Shu-Yee Freake** ([chenryi@gmail.com](mailto:chenryi@gmail.com)), Newton North High School, Newton, MA

Physics teachers will share examples and experience from implementing both physical and online engineering journals in all levels of physics classes.



### Developing NGSS Rubrics and Tasks Using Marzano's Taxonomy

(Grades 6–12)

C209, GWCC

Science Focus: GEN, NGSS

**Tomas Atencio-Pacheco** (@learnologist; [learnologist@gmail.com](mailto:learnologist@gmail.com)), **Julia Dumars** (@juliadumars; [juliadumars@gmail.com](mailto:juliadumars@gmail.com)), and **Sariah Bujanda** ([sariahbj@gmail.com](mailto:sariahbj@gmail.com)), South Valley Academy, Albuquerque, NM

We will help you to update and develop mastery-based rubrics that meet the NGSS using Marzano and Kendall's taxonomy of learning to guide instruction, rigor, and assessment.

### Engage, Explore, Energize: An Adventure on Owl Island

(Grades 5–9)

C210, GWCC

Science Focus: ETS1, CCC2, CCC3, SEP1, SEP2, SEP3, SEP8

**Julia Luetkenhaus** ([julialuetkenhaus@hotmail.com](mailto:julialuetkenhaus@hotmail.com)) and **Stacey Wade** ([staceywade@wsdr4.org](mailto:staceywade@wsdr4.org)), Frontier Middle School, O'Fallon, MO

Explore the engineering design process while merging math/science and engaging in hands-on STEM activities. These activities energize students to hypothesize, problem-solve, and think critically.

### Exploration Questions: A Simple Way to Move Toward 3-D Teaching, Learning, and Assessment

(Grades 5–8)

C211, GWCC

Science Focus: PS1, CCC2, CCC3, CCC5, CCC7, SEP2, SEP3, SEP4, SEP5, SEP6, SEP7

**Sabine Jeske** ([sabine.jeske@ucsf.edu](mailto:sabine.jeske@ucsf.edu)) and **Jessica Allen** ([jessica.allen@ucsf.edu](mailto:jessica.allen@ucsf.edu)), UCSF Science & Health Education Partnership, San Francisco, CA

Engage your students in three-dimensional learning using simple, easy-to-implement student-designed experiments that develop conceptual understanding of basic physical science concepts.

### Exploring Visible and Infrared Light and Energy in a 3-D Learning Setting

(Grades 9–12)

C212, GWCC

Science Focus: ESS1.A, PS, CCC, SEP

**Pamela Harman** ([pharman@seti.org](mailto:pharman@seti.org)) and **Coral Clark** ([cclark@seti.org](mailto:cclark@seti.org)), SETI Institute, Mountain View, CA

Practice activities with simple classroom technology that explore the EM spectrum detection technology and explanatory models, as well as illustrate real-world applications in space science.

### Teaching Chemical Reactions Through a Variety of Modalities

(Grades 7–12)

C302, GWCC

Science Focus: PS, SEP2

**Kimberly Duncan** (@chemduncan; [kimberly.z.duncan@gmail.com](mailto:kimberly.z.duncan@gmail.com)), American Association of Chemistry Teachers, Washington, DC

Chemical reactions are a very important topic in chemistry. I'll share a variety of instructional modalities from the particulate to macroscopic perspective.

### Drone/UAV Lessons for Science and STEM Education

(Grades 5–12)

Grand Ballroom B, Omni

Science Focus: ETS, PS2.A, PS2.C, PS3.B, PS3.C, CCC2, CCC5, CCC7, SEP1, SEP3, SEP4, SEP5, SEP6, SEP7, SEP8

**Randy Russell** (@FlyRussell; [rrussell@ucar.edu](mailto:rrussell@ucar.edu)), UCAR Center for Science Education, Boulder, CO

We will share a curriculum for learning to fly drones/UAVs followed by scientific measurements and engineering challenges. Tested with students! Several lessons for beginners through intermediate UAV users.

### CSSS-Sponsored Session: Engaging Students in Using the Crosscutting Concepts to Make Sense of Phenomena

(General)

International Ballroom E, Omni

Science Focus: GEN, CCC

**Nicole Paulson** ([nicole.paulson@nebo.edu](mailto:nicole.paulson@nebo.edu)) and **Brett Moulding** ([mouldingb@ogdensd.org](mailto:mouldingb@ogdensd.org)), Partnership for Effective Science Teaching and Learning, Ogden, UT

We will model instruction at the intersection of the three dimensions while focusing on engaging students in using the crosscutting concepts to make sense of phenomena.



### 3:30–4:30 PM Exhibitor Workshops

#### Using Problem-Based Learning to Up Your NGSS Game

(Grades K–12)

B216, GWCC

Science Focus: GEN, NGSS

Sponsor: Pearson Learning Services

**Michael Padilla**, 2005–2006 NSTA President, and Professor Emeritus, University of Georgia and Clemson University, Clemson, SC

A major shift with NGSS is the focus on more scenario- and Problem-Based Learning. When students solve problems and see the fit with their daily lives, they are better prepared for next steps in school and career. Come learn more about engaging your students in real-world problem solving.

#### STEM Literacy Strategies for Making Science Concepts Comprehensible

(Grades 3–12)

B301, GWCC

Science Focus: GEN

Sponsor: STEMscopes

**Sharry Whitney** ([swhitney@acceleratelearning.com](mailto:swhitney@acceleratelearning.com)), STEMscopes, Houston, TX

Join us as we learn the power of using Close Reading strategies to engage students in reading, writing, and discussing the science text in collaborative groups, which will lead to student mastery and high achievement. This session will convince you that your students CAN read science and build the capacity for scientific literacy success in your STEM classroom.

#### Use Data to Slay Misconceptions About Photosynthesis and Respiration

(Grades 6–12)

B315, GWCC

Science Focus: LS1.C, LS2.B, PS3.D

Sponsor: PASCO scientific

**Ryan Reardon**, Shades Valley High School, Irondale, AL

How can you clear up student misconceptions about respiration only occurring in the dark, or that only green light is used for photosynthesis? With data! Plan and carry out investigations on carbon exchange and plant pigments by building a model to illustrate how plants convert light energy into chemical energy.

#### STEM Activity: Better Bridge Building!

(Grades 7–12)

B316, GWCC

Science Focus: ETS, PS, CCC1, CCC2, CCC6, CCC7, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8

Sponsor: PASCO scientific

**Tom Hsu**, PASCO scientific, Roseville, CA

Discover powerful, intuitive ways to teach your students how bridges really work. With a wireless force sensor, see how forces flow through a bridge and understand why trusses have triangles. We will show you how to build and measure different bridge designs.

### 3:30–5:00 PM Meeting

#### SCST Business Meeting

Hickory, Omni

### 3:30–5:30 PM Hands-On Workshop

#### Science and Literacy in the K–5 Classroom

(Grades K–5)

A314, GWCC

Science Focus: GEN, NGSS

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

**Mark Eastburn** ([@markeastburnpps](mailto:@markeastburnpps); [memarkeastburn@gmail.com](mailto:memarkeastburn@gmail.com)), Riverside Elementary School, Princeton, NJ

**Morris McCormick** ([morris.mccormick@armintaes.net](mailto:morris.mccormick@armintaes.net)), Arminta Street Elementary School, North Hollywood, CA

Engage your K–5 students in science and literacy through interactive e-books. This session showcases how interactive e-books, along with hands-on activities, can meaningfully engage students in learning science, English language arts, and mathematics.

#### 4:00–4:30 PM Presentations

##### STEM and the Urban Elementary Classroom

(Grades P–5)

A401, GWCC

Science Focus: GEN, SEP

**Natalie Rachel** (@SLLewis\_STEM; [rachelns@fultonschools.org](mailto:rachelns@fultonschools.org)), Fulton County Schools, Atlanta, GA

An urban elementary school STEM teacher discusses using three-dimensional STEM instruction as a vehicle for building critical-thinking skills and positive impact on student learning.

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

(Grades K–3)

A408, GWCC

Science Focus: ETS

**Ryan Erickson**, Cedar Park Elementary STEM School, Apple Valley, MN

3D printing has become synonymous with the maker movement. Find out how to authentically integrate 3D printing technology in our youngest K–3 classrooms.



##### I Want to Notebook, Too! How to Begin from Beginners

(Grades K–5)

B212, GWCC

Science Focus: GEN

**Amanda Martin** ([mandaleem.123@gmail.com](mailto:mandaleem.123@gmail.com)) and **James Bruegenhemke** ([jamesbruegenhemke@wsdr4.org](mailto:jamesbruegenhemke@wsdr4.org)), Boone Trail Elementary School, Wentzville, MO

Come discuss ways to jump into science notebooking by sharing starting points, organizational ideas, getting your building behind you, and resources to use.

#### Helping Students to Think Like a Scientist!

(Grades 5–12)

Birch, Omni

Science Focus: GEN, NGSS

**Susan Koppendraye**, Calvin Christian School, Minneapolis, MN

Science fair and the NGSS are a perfect pair. Find out how the science fair provides students with an established outlet for hands-on inquiry and real science and engineering practices that integrate CCSS and the NGSS.

#### Creating Access to STEM Enrichment for Girls in Rural Georgia

(Grades 3–College)

Pine (South Tower), Omni

Science Focus: GEN, SEP6

**Justin Ballenger** (@justinBallenge1; [ballenger\\_hj@mercer.edu](mailto:ballenger_hj@mercer.edu)), Mercer University, Atlanta Campus, Atlanta, GA

**Sabrina Walthall** (@DrWalthall; [slwalthall@yahoo.com](mailto:slwalthall@yahoo.com)), Mercer University, Macon, GA

**Wesley Fondal** ([wesley@starbaserobins.org](mailto:wesley@starbaserobins.org)), STARBASE Robins, Warner Robins, GA

We will focus on the outcomes Mercer University's Woodrow Wilson Teaching Fellows Program has achieved by fostering relationships with local partner organizations for the purpose of increasing access to STEM for girls living in middle Georgia.

#### 4:00–5:30 PM Exhibitor Workshops

##### Shark Dissection: A “Jawsome” Experience!

(Grades 9–12)

B202, GWCC

Science Focus: LS3, CCC6

Sponsor: Carolina Biological Supply Co.

##### Carolina Teaching Partner

Dive in and learn how to create your own Shark Week! This session guides participants through a hands-on dissection of a dogfish shark. Take a bite out of NGSS practices related to adaptations and structure and function while giving your students an experience they will never forget.

##### Flipping AP Biology with FlinnPREP™

(Grades 9–College)

B203, GWCC

Science Focus: LS

Sponsor: Flinn Scientific, Inc.

**Matt Anderson** ([manderson@flinnsci.com](mailto:manderson@flinnsci.com)) and **Annemarie Duncan** ([aduncan@flinnsci.com](mailto:aduncan@flinnsci.com)), Flinn Scientific, Inc., Batavia, IL

Flipping your AP biology class will help your classroom focus on mastering science practices. Learn how FlinnPREP, a supplemental digital curriculum with assessment solutions, can ease your transition by providing video, images, and written content in a condensed form. This tool assesses student understanding and is a jumping-off point for teaching modeling. Resources and door prizes. AP is a trademark of the College Board. Visit [www.flinnsci.com](http://www.flinnsci.com) and [www.flinnprep.com](http://www.flinnprep.com) for more information.

**Clean Up Your Mess!***(Grades 6–12)*

B204, GWCC

Science Focus: ESS3

Sponsor: Carolina Biological Supply Co.

**Carolina Teaching Partner**

Pollution remediation is a messy but necessary business. Experience hands-on environmental science activities that model the techniques used to clean up pollution. Depending on instructional objectives, qualitative observations or quantitative measurements may be made.

**Biology with Vernier***(Grades 7–College)*

B207, GWCC

Science Focus: ETS2, LS1, LS2

Sponsor: Vernier Software &amp; Technology

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

Participate in fun and engaging hands-on experiments that use Vernier digital tools to investigate cellular respiration, enzyme activity, and the spectral analysis of chlorophyll. See how sensor-based experiments teach students about data collection and analysis—practices that promote science inquiry, improve science literacy, and boost test scores.

**Renewable Energy with KidWind and Vernier***(Grades 7–College)*

B208, GWCC

Science Focus: ESS3, ETS2, PS3

Sponsor: Vernier Software &amp; Technology

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

Explore renewable energy and engineering design with KidWind kits and Vernier technology. In this hands-on workshop, you will collect and analyze data using a Vernier Energy Sensor. See how sensor-based experiments teach students about data collection and analysis—practices that promote science inquiry, improve science literacy, and boost test scores.

**Performance Assessments: Engaging and Fun!***(Grades 6–8)*

B209, GWCC

Science Focus: GEN, NGSS

Sponsor: TCI

**Christy Sanders**, TCI, Mountain View, CA

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

**Are You Moody?***(Grades 6–12)*

B213, GWCC

Science Focus: ETS, PS, CCC2, SEP5, SEP6

Sponsor: Texas Instruments

**Fred Fotsch**, Texas Instruments, Dallas

We will bring science and coding together as participants learn to do some basic coding (no experience necessary) while developing their own mood ring! The science of color mixing is explored while determining the right body temperature thresholds. Is fuchsia flirty? Should green be groovy? It's up to you!

**See Science in a Whole New Light with Thermal Imaging***(Grades 9–College)*

B214, GWCC

Science Focus: PS

Sponsor: FLIR Systems, Inc.

**Desmond Lamont** ([desmond.lamont@flir.com](mailto:desmond.lamont@flir.com)), FLIR Systems, Inc., Wilsonville, OR

Fundamental education or applied research—look at science in a new light through the power of infrared! Thermal imaging is increasingly popular at high schools for teaching fundamentals of heat transfer, while universities use it for teaching and research. Get ideas for putting thermal imaging to work in your program.

**Hands-On Approach to Teach Electricity in Japan***(Grades 7–12)*

B215, GWCC

Science Focus: PS2.B, PS3.A, PS3.B

Sponsor: NaRiKa Corp.

**Taiki Watanabe** ([global@rika.com](mailto:global@rika.com)) and **Michal Marcik**, NaRiKa Corp., Tokyo, Japan

As a time-honored Japanese company, NaRiKa introduces a hands-on approach to teach electricity, which is a topic so many teachers worldwide struggle with. Our participatory workshop provides solutions in the Japanese way for this challenge along with our handheld generator covering both static and dynamic electricity, including energy conservation and conversion.

### Bringing Standards-Based Nanotechnology Lessons into the Secondary Science Classroom: Addressing 3-D Learning

(Grades 6–12)

B217, GWCC

Science Focus: GEN, NGSS

Sponsor: National Nanotechnology Coordination Office

**Lisa Friedersdorf** ([lfriedersdorf@nnco.nano.gov](mailto:lfriedersdorf@nnco.nano.gov)), National Nanotechnology Coordination Office, Alexandria, VA

**Nancy Healy** ([nancy.healy@ien.gatech.edu](mailto:nancy.healy@ien.gatech.edu)), Georgia Institute of Technology, Atlanta

**Joyce Allen** ([joyce.allen@wheelercountyschools.onmicrosoft.com](mailto:joyce.allen@wheelercountyschools.onmicrosoft.com)), Wheeler County High School, Alamo, GA

The National Nanotechnology Coordinated Infrastructure (NNCI) is an NSF-sponsored program with a goal of providing educational materials and training for middle school and high school teachers. We will demonstrate how nanotechnology can fit into secondary science classrooms (physical science, physics, chemistry, and biology) by using standards-based hands-on activities. All of the lessons have been tested in classrooms and use relatively inexpensive materials

### JASON Learning Inspiring All Learners, Building STEM Communities

(Grades 4–12)

B218, GWCC

Science Focus: ESS2, ESS3, ETS, LS2, PS2, PS3, PS4, CCC, SEP

Sponsor: JASON Learning

**Amy O’Neal** ([amy@jason.org](mailto:amy@jason.org)), JASON Learning, Ashburn, VA

Districts are responsible for preparing their communities for a jobs-driven economy. Success requires a holistic approach—all students/all learners must be supported by their entire community in order to value scientific literacy and achieve at high levels. Find out how JASON Learning is building STEM Communities, and how you can participate.

### Evolutionary Evidence in the Fossil Record

(Grades 6–8)

B302, GWCC

Science Focus: ESS, LS4

Sponsor: Delta Education/School Specialty Science—FOSS

**Ann Moriarty**, The Lawrence Hall of Science, University of California, Berkeley

What does the fossil record tell us about how life has changed over time? Explore evolutionary history through hands-on activities from the new FOSS Next Generation Heredity and Adaptation Course for middle school, and identify connections to the three dimensions of NGSS.

### Makerspace Strategies and Solutions for the Secondary Level

(Grades 6–12)

B303, GWCC

Science Focus: ETS

Sponsor: Frey Scientific/School Specialty Science

**Erik Benton**, CPO Science/School Specialty Science, Nashua, NH

**Kat Mills**, School Specialty Science, Rosharon, TX

Dive into the maker world and get your students into making! Explore ways to set up, maintain, and expand successful secondary-level makerspaces. Play with great new equipment to experience valuable makerspace activities, and discover how School Specialty is a leader in educational curriculum, EdTech, supplies, and furniture.

### Georgia on My Brain: Hands-On Neuroscience Labs

(Grades 5–12)

B304, GWCC

Science Focus: LS

Sponsor: Ward’s Science

**Gregory Gage**, Backyard Brains, Inc., Ann Arbor, MI

Using simple, yet powerful neuroscience kits, popularized through engaging *Ted Talks* and *Mythbuster* videos, you can help enlist the next generation of neuroscientists. Backyard Brains’ kits show students firsthand how the brain communicates with our senses, memories, and desires. This workshop will demonstrate our human, invertebrate, and plant biology devices.

### pH Scale

(Grades 9–11)

B305, GWCC

Science Focus: PS, SEP4, SEP5

Sponsor: Lab-Aids, Inc.

**Brandon Watters**, Vernon Hills High School, Vernon Hills, IL

What does pH actually measure? In this investigation, you will measure pH indirectly using indicators and absorption using the Lab-Master. Using their data, participants generate a graph of absorbance versus pH. This graph can be used to determine the pH of solutions, within the measured pH range. Join us for this activity from *The Natural Approach to Chemistry* program.

### Exploring Trophic Cascades with HHMI BioInteractive Resources

(Grades 9–12)

B308, GWCC

Science Focus: LS2.A, LS2.B, LS2.C, CCC2, CCC4, CCC5, CCC7, SEP2, SEP4, SEP5, SEP6

Sponsor: HHMI BioInteractive

**Mark Eberhard** ([meberhard@ecsd.us](mailto:meberhard@ecsd.us)), St. Clair High School, Saint Clair, MI

**Cindy Gay** ([cindyjgay@gmail.com](mailto:cindyjgay@gmail.com)), BSCS, Colorado Springs, CO

Use free HHMI BioInteractive resources based on the groundbreaking work of two extraordinary ecologists to explore top-down controls to population and species regulation, keystone species, and trophic cascades! Engage in hands-on modeling and sense-making strategies to improve your students' understanding of ecology.

### Identify Patient Zero of a Zombie Apocalypse!

(Grades 9–College)

B310, GWCC

Science Focus: LS

Sponsor: Bio-Rad Laboratories

**Damon Tighe**, Bio-Rad Laboratories, Hercules, CA

Explore the spread of a zombie virus with this hands-on lab using the power of an ELISA assay. The specific nature of antibodies enables the testing of almost any biological molecule that elicits an immune response. Learn how an ELISA can monitor transmission and track the spread of disease!

### Lab Skills: The Escape Room!

(Grades 9–College)

B311, GWCC

Science Focus: LS

Sponsor: Bio-Rad Laboratories

A mysterious illness renders patients incoherent and a group of field scientists is missing. You must follow the clues to find the cure and solve the mystery in Bio-Rad's lab skills escape room for high school and college life science. Workshop space is limited. Get tickets at the Bio-Rad booth.

### STEAM Meets IoT: Code Your Own Autonomous Vehicle with SAM Labs

(General)

B313, GWCC

Science Focus: ETS1, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8

Sponsor: Educational Innovations, Inc.

**David Weiss** and **Morten Hagen**, SAM Labs, London, UK  
Full STEAM ahead with EI and SAM Labs! Use electronic SAM Labs blocks (and app) to construct and code a self-driving car—one of the many “Internet of Things” creations

you can build. Download the Curious Cars app to your device beforehand and prepare to unleash your students' inventive potential!

### Get a Move On! Modeling Molecular Transport Across the Cell Membrane

(Grades 8–College)

B403, GWCC

Science Focus: LS1, PS1, PS2, CCC1, CCC2, CCC4, CCC6, CCC7, SEP1, SEP2, SEP6

Sponsor: 3D Molecular Designs

**Gina Vogt** ([gina.vogt@3dmoleculardesigns.com](mailto:gina.vogt@3dmoleculardesigns.com)), 3D Molecular Designs, Milwaukee, WI

**Tim Herman** ([herman@msoe.edu](mailto:herman@msoe.edu)), MSOE Center for Bio-Molecular Modeling, Milwaukee, WI

Support three-dimensional learning with materials that engage your students in an exploration of rare chemical and physical properties of water and the membranes that separate cells from their surrounding environment. Construct a model to explain diffusion, osmosis, and active and passive transport of molecules across the cell membrane.

### National Geographic's Geo-Inquiry Process in Action!

(Grades 6–8)

B404, GWCC

Science Focus: ESS, SEP1, SEP3, SEP4, SEP6, SEP8

Sponsor: National Geographic Society

**Alexandra Perrotti** ([aperrotti@ngs.org](mailto:aperrotti@ngs.org)), National Geographic Education, Washington, DC

**Melissa MacPhee** ([mmacphee@ngs.org](mailto:mmacphee@ngs.org)), National Geographic Society, Washington, DC

Geo-Inquiry is an exciting, new integrated, project-based process that connects students to real-world questions and National Geographic Explorers. In this interactive session, educators will learn new strategies to help students develop the critical-thinking skills to ask geographic questions, collect information, use GIS to visualize data, create a compelling story using photography and videography tips, and ultimately become advocates for change in their local community.



### Explore Cells in 3D!

(Grades 12–College)

B408, GWCC

Science Focus: LS, CCC1, CCC2, CCC3, CCC4, CCC6, CCC7, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Sponsor: Nanolive SA

**Lisa Pollaro** ([lisa@nanolive.ch](mailto:lisa@nanolive.ch)) and **Kulsum Farshori** ([kulsum@nanolive.ch](mailto:kulsum@nanolive.ch)), NanoLive SA, Switzerland

Nanolive's educational program engages students in interactive biology learning through a revolutionary microscope, the 3D Cell Explorer, which allows you to explore living cells in 3D without damaging them. Our mission is to empower educators to develop clear hands-on experiments, helping students to gain deeper understanding in cell biology.

### 4:00–6:00 PM Meeting

#### APAST Social and Business Meeting

(By Invitation Only)

Cottonwood A/B, Omni

### 4:30–5:30 PM Meeting

#### NSTA Recommends Meeting

Willow Boardroom, Omni

Please visit [www.nsta.org/recommends](http://www.nsta.org/recommends) for more information.

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### 5:00–5:30 PM Presentations

#### Engaging Geysers: Modeling Geyser Eruptions in the Earth Science Classroom

(Grades 6–College)

A303, GWCC

Science Focus: ESS2.B, ESS2.C, ETS1, CCC4, SEP2, SEP3, SEP6

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

Following a National Geographic expedition to Iceland, learn how a Grosvenor fellow's students have used inquiry processes to model hydro-geothermal features associated with volcanoes.

#### The Melanin Unit: An Example of an NGSS Storyline

(Grades 8–12)

C202, GWCC

Science Focus: LS1.A, LS1.D, LS3, LS4.B, LS4.C, CCC, SEP

**Jason Crean** ([jcrean@lths.net](mailto:jcrean@lths.net)), Lyons Township High School South, Western Springs, IL

Using albinism as the driving phenomenon, this three-dimensional unit serves to integrate multiple concepts in a cohesive storyline, including DNA, proteins, genetics, and evolution.

#### Broadening Borders to Build Better Schools

(Grades 9–12)

C206, GWCC

Science Focus: ETS, CCC1, CCC2, SEP

**Paul Munshower** ([@PaulMunshower](mailto:@PaulMunshower); [drpmunshower@gmail.com](mailto:drpmunshower@gmail.com)), Abilene (TX) ISD

Project-Based Learning collaborations on international teams not only make the content authentic and relevant through active engagement but also improve global and technology literacy.

#### The Role of a Coherent Research-Based Curricular Unit in Mediating Interconnected Understanding of Agricultural Impact Among Students

(Grades 9–12)

C207, GWCC

Science Focus: GEN, NGSS

**Gillian Roehrig** ([@ghroehrig](mailto:@ghroehrig); [roehr013@umn.edu](mailto:roehr013@umn.edu)), ASTE President, and STEM Education Center, Saint Paul, MN

This agriculture-related curricular unit is a response to the demand of framing K–12 curricula around three dimensions to build cohesive cross-disciplinary understanding of science.

#### 3-D Learning with GPB's Physics in Motion Series

(Grades 9–12)

C301, GWCC

Science Focus: PS4.A, PS4.B

**Laura Evans** ([@GPBEducation](mailto:@GPBEducation); [levans@gpb.org](mailto:levans@gpb.org)), Georgia Public Broadcasting, Atlanta

**Katie Lowrie** ([katie\\_lowrie@hotmail.com](mailto:katie_lowrie@hotmail.com)), East Coweta High School, Sharpsburg, GA

Physics in Motion is Georgia Public Broadcasting's new digital series for high school. It was developed by a team of certified educators and uses video demonstrations and three-dimensional tasks to encourage inquiry-based learning.

### **Making Makers: Mind-Set Shifting Activities to Support a Culture of Problem-Solving in the Science Classroom**

(Grades 3–12)

*Dogwood A, Omni*

Science Focus: GEN, NGSS

**Gina Tesoriero** (*ginateso@uw.edu*), University of Washington, Seattle

**Jeannie Gargiulo** (*jeanniegargiulo@gmail.com*), Fieldston Lower, Middle, and Upper School, Harrison, NY

**Amanda Solarsh** (*amandasolarsh@gmail.com*), Simon Baruch MS104, New York, NY

Open pathways to entrepreneurship by inspiring engineering practices and critical thinking in your classroom

### **Day-to-Day Job Embedded Professional Development Supportive of NGSS Implementation**

(Grades P–12)

*Juniper, Omni*

Science Focus: GEN, NGSS

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

**Todd Campbell** (*@dtcampbe*; *todd.campbell@uconn.edu*), University of Connecticut, Storrs Mansfield

As day-to-day job-embedded PD becomes more necessary, an “NGSS Scientist in Residence” model will be shared stemming from a STEM Academy in Connecticut. The goal is to find a more inclusive and motivating curriculum for the NGSS that leverages the interests and backgrounds of the school’s diverse population.

### **Applying STEM Models of Instruction: Synectics Teaching**

(Grades 6–College)

*Magnolia, Omni*

Science Focus: ESS1.A, ESS1.B, ESS2.A, ETS1, ETS2.B, LS1.A, LS2.B, LS2.C, PS1.A, PS2.B, CCC5, CCC6, SEP1, SEP2

**Andrew Lowry** (*@EducationDrew*; *andrewmlowry@katyisd.org*), Mayde Creek High School, Houston, TX

Learn about the Synectics teaching model and how it encourages learners to be creative and discover new solutions through collaboration and the development of analogies.

### **Reducing Barriers: Guiding Students of Color Toward Brighter Futures**

(Grades 5–College)

*Walnut, Omni*

Science Focus: GEN

**Courtney Jackson** (*courtney@illinois.edu*), University of Illinois Extension, Cook County Main Office, Matteson  
Students of color remain overrepresented among low-paying college majors. We will focus on what K–12 educators can do to guide students toward profitable career choices.

### **5:00–5:45 PM Networking Opportunity Shell Reception**

(By Invitation Only)

*Grand Ballroom A, Omni*

### **5:00–6:00 PM Networking Opportunity Reception for Georgia Science Teachers**

(By Ticket Through GSTA)

*International Ballroom F, Omni*

Georgia science teachers are invited to network and learn more about GSTA. Hors d’oeuvres provided and cash bar available. Tickets are available through GSTA at [www.georgiascienceteacher.org](http://www.georgiascienceteacher.org).

### **5:00–6:00 PM Presentations**

#### **Model My Watershed: Using Real Data to Make Watershed Decisions**

(Grades 5–College)

*A301, GWCC*

Science Focus: LS2, SEP

**Nanette Marcum-Dietrich** (*ndietrich@millersville.edu*), Millersville University of Pennsylvania, Millersville

**Carolyn Staudt** (*@cjstaudt*; *cstaudt@concord.org*), Curriculum/Professional Developer, Concord, MA

**Steve Kerlin** (*skerlin@stroudcenter.org*), Stroud Water Research Center, Avondale, PA

Come learn about an exciting, free online modeling application that gives anyone (age 8+) the ability to use STEM practices to explore their local watershed.

### **INF ASTC-Sponsored Session: Immersing Students and Teachers in Science Field Research: Developing Collaborations Between Informal Educators, Formal Educators, and Research Scientists**

(Grades 5–12)

*A304, GWCC*

Science Focus: GEN, INF

**Kathy Zagzebski** (*@MITSinc86*; *@MarineLifeCtr*; *kzagzebski@nmlc.org*), National Marine Life Center, Buzzards Bay, MA

**Elizabeth Duff** (*lduff@massaudubon.org*), Endicott Wildlife Sanctuary, Wenham, MA

**Linda McIntosh** (*@mitsinc86*) and **Brianna Wilkinson** (*@MITSinc86*; *brianna.wilkinson@gmail.com*), MITS, Inc. (Museum Institute for Teaching Science), Quincy, MA

Informal institutions provide teacher professional development, creating partnerships with scientists that result in student participation in research projects with universities, national estuarine research reserves, U.S. Fish and Wildlife, and more.



### Talking the Talk: Fostering a Culture of Productive Science Discourse in the Elementary Classroom

(Grades K–5)

A401, GWCC

Science Focus: GEN, SEP7, SEP8

**Alissa Berg** (@alissaberg; [alissaberg@gmail.com](mailto:alissaberg@gmail.com)), Academy for Urban School Leadership (AUSL), Chicago, IL

**Sheri Roney** ([slroney@cps.edu](mailto:slroney@cps.edu)) and **Christine Berman** ([ceberman@cps.edu](mailto:ceberman@cps.edu)), Tarkington School of Excellence, Chicago, IL

Delve into several concrete strategies that help build a classroom culture where students engage in in-depth, equitable, evidence-based science discussions. Explore a classroom video and tools.

### Using SMART Questions to Boost Your Students' Science Literacy

(Grades 2–8)

A407, GWCC

Science Focus: GEN, SEP1

**Gary Lewis** ([glewis@mmsa.org](mailto:glewis@mmsa.org)) and **Lisa Marchi** ([lmarchi@mmsa.org](mailto:lmarchi@mmsa.org)), Maine Mathematics and Science Alliance, Augusta  
Discover how to use Specific, Measurable, Attainable, Relevant/Realistic, and Timely elements to questioning to boost your students' science literacy.



### NSTA Press® Session: *STEM Road Map: Integrated STEM Teaching in Middle School*

(Grades K–12)

B405, GWCC

Science Focus: GEN, NGSS

**Erin Peters-Burton** (@CSEsquared; [epeters1@gmu.edu](mailto:epeters1@gmu.edu)), George Mason University, Fairfax, VA

**Carla Johnson** (@drcarlaj; [carlacjohnson@purdue.edu](mailto:carlacjohnson@purdue.edu)), Purdue University, West Lafayette, IN

Come learn about the new *STEM Road Map* Curriculum Series, a K–12 integrated STEM curriculum focused on engaging students in teams in problem- and project-based learning to solve real-world problems in five-week units. Participants will receive samples of curriculum activities and will learn more about teaching science through an integrated STEM approach.

### Calling All New or Almost New Teachers!

(Grades 7–12)

C213, GWCC

Science Focus: GEN

**Kyla BradyLong** ([kbradylong@gmail.com](mailto:kbradylong@gmail.com)), Maria Carrillo High School, Santa Rosa, CA

Are you a new teacher? Have questions you need answered? Come join a panel of newish teachers (Noyce Scholars who've been teaching three–five years) as we share lessons learned. Come get your questions answered, from teachers who were just there.

### Linking Literacy in Middle School and High School: Promoting Student Learning in Science and Language Arts Through Argumentation

(Grades 6–College)

International Ballroom C, Omni

Science Focus: GEN, CCC, SEP6, SEP7, SEP8

**Kevin Fleming** ([kevin.james.fleming@gmail.com](mailto:kevin.james.fleming@gmail.com)) and **Dina Secchiaroli** (@DinaSecchiaroli), Area Cooperative Educational Services (ACES), Hamden, CT

High-leverage instructional strategies and featured activities focusing on argumentation and evidence-based thinking that promote student learning in science and literacy will be explored in a learning-by-doing setting.



### “The Sheep Are in the Jeep”: Forces and Motion

(Grades 1–3)

B212, GWCC

Science Focus: PS

**L. Octavia Tripp** ([tripplo@auburn.edu](mailto:tripplo@auburn.edu)) and **Megan Burton** ([meb0042@auburn.edu](mailto:meb0042@auburn.edu)), Auburn University, Auburn University, AL

Use trade books to illustrate literacy and science inquiry methods to support student's ability to read and produce scientific texts while creating an NGSS 5E lesson.

### Putting Research into Practice: Extended NGSS PD in Cook County, Illinois

(Grades K–12)

Pine (South Tower), Omni

Science Focus: GEN, NGSS

**Meghan McCleary** ([mmccl5@illinois.edu](mailto:mmccl5@illinois.edu)) and **Susan Gasper** ([smgasper@illinois.edu](mailto:smgasper@illinois.edu)), University of Illinois Extension, Cook County Branch Office, Chicago

Hear how University of Illinois Extension's STEM team is conducting extended PD to help Chicago-area teachers put the research behind NGSS into practice.

**5:00–6:00 PM Hands-On Workshops****INF Blast Off with Astronomy Club!***(Grades 6–8)**A302, GWCC*

Science Focus: ESS1.A, ESS1.B, ETS1.B INF, SEP2

**Kris Grymonpre** (*kgrymonpre@bostonpublicschools.org*), John W. McCormack Middle School, Boston, MA

Join our Urban Astronomy Club for hands-on activities. Learn how you can get your entire school involved with schoolwide telescope viewings.

**Using NGSS Science and Engineering Practices to Study Climate Change***(Grades 6–12)**A305, GWCC*

Science Focus: ESS2, ESS3, ETS, LS2, PS3, CCC4, CCC5, SEP

**Pat Harcourt** (*@ClimatMADECLEAR; pharcourt@umces.edu*), MADE-CLEAR, Annapolis, MD

We will share model lessons that use NGSS science and engineering practices to investigate climate change mechanism, evidence, impacts, and solutions.

**Using Primary Sources as Anchoring Phenomena***(Grades 6–12)**A313, GWCC*

Science Focus: GEN, CCC1, SEP1, SEP6

**Brianna Reilly** (*@MsB\_Reilly; breilly39@gmail.com*), Hightstown High School, Hightstown, NJ

Explore strategies for using primary sources as anchoring phenomena to support three-dimensional learning and the nature of science understanding outlined in the NGSS.

**STEM: Science Taught for All Minds***(Grades 3–8)**A315, GWCC*

Science Focus: GEN

**Tonya Grimmke** (*tonya.grimmke@cobbk12.org*), Cobb County School District, Marietta, GA

Experience research-based ways to modify and accommodate STEM lessons for all learners, even those with intellectual disabilities.

**Lightweight and Strong: Building NASA's Space Launch System***(Grades 4–8)**A316, GWCC*

Science Focus: ETS, SEP

**Twila Schneider**, NASA Marshall Space Flight Center, Huntsville, AL

NASA is putting final touches on the Space Launch System Rocket in preparation for test launch in 2018. Learn about NASA's educational activities and plans.

**Mammal Versus Reptile Skull: What Are the Differences?***(Grade 3)**A402, GWCC*

Science Focus: LS4.A, CCC3, SEP4

**Rebecca Mussetter** (*rmussetter@sccs.net*), DeLaveaga Elementary School, Santa Cruz, CA**Michael Ziegler** (*michael.ziegler@bobcats.gcsu.edu*) and **Claudia Grant** (*@paleoteach; @claugrant; cgrant@flmnh.ufl.edu*), University of Florida, Gainesville**Jeanette Pirlo** (*jpirlo@flmnh.ufl.edu*), Florida Museum of Natural History, Gainesville

Paleontologists found a set of mammal and reptile skulls but they lost the labels! We will use 3D-printed skulls for data collection and identification.

**Phenomenal Folktales***(Grades K–2)**A403, GWCC*

Science Focus: GEN, CCC6, SEP1

**Margaret Giunta** (*giuntam@pcsb.org*), Douglas L. Jamerson, Jr. Elementary School, Saint Petersburg, FL

Explore the use of traditional folktales as a means to connect with the nature of science in contemporary times.

**STEM—From Catchphrase to Culture!***(Grades P–5)**A404, GWCC*

Science Focus: GEN, NGSS

**Rosemary Berson** (*@RosemaryBerson*), Orange County Public Schools, Orlando, FL

Hear how STEM can be implemented at the class, school, district, and community levels, changing it from just a catchphrase to a culture!

**Digital Badging: Incorporating Literacy, Science, and Engineering as a Cohesive Model***(Grades 6–12)**A405, GWCC*

Science Focus: ETS1, SEP

**Kianga Thomas** and **Arthur Bowman** (*awbowman@nsu.edu*), Norfolk State University, Norfolk, VA

Find out how to use digital badging as a portfolio means for reading, interpreting, and using science concepts to complete a digital badge. Receive strategies on ways to engage students through literacy strategies to build a digital badge for mastery of science concepts. The engineering design process will be embedded.

### Fun Weird Science Phenomena

(Grades 3–8)

A410, GWCC

Science Focus: PS1.B, PS2.A, PS3.C

**Ronnie Thomas** (@aisciguy; rthomas@aishool.org), Atlanta International School, Atlanta, GA

Science is something that students have to DO! Come investigate phenomena and model engaging NGSS learning experiences guaranteed to hook students.

### NESTA and PRI: Activities from the Teacher-Friendly Guide to Climate Change

(Grades 5–College)

B103, GWCC

Science Focus: ESS3, CCC

**Don Duggan-Haas** (@dugganhaas; dugganhaas@gmail.com), **Robert Ross** (@geoscienced; rml16@cornell.edu), and **Ingrid Zabel** (zabel@priweb.org), Paleontological Research Institution, Ithaca, NY

This guide, available free online, addresses the science and psychological and social issues that make it challenging to teach and learn. Explore the guide.



### Using Equitable Assessment Tasks to Engage All Students in 3-D Learning

(Grades 6–8)

B211, GWCC

Science Focus: GEN, NGSS

**Nonye Alozie** (nonye.alozie@gmail.com) and **Christopher Harris** (@chrsharris; christopher.harris@sri.com), SRI International, Menlo Park, CA

**Phyllis Haugabook Pennock** (phyllishpennock@gmail.com), CREATE for STEM Institute, Michigan State University, East Lansing

**Krystal Madden** (kmadde4@gmail.com), The University of Illinois at Chicago

**Samuel Severance** (@SamSeverance; severans@colorado.edu), University of Colorado Boulder

Plan your science instruction by exploring and working with instructionally supportive assessment tasks designed to engage students of diverse backgrounds in three-dimensional learning.

### Let's Get Vertical

(Grades 6–12)

B402, GWCC

Science Focus: LS1.A, PS1.B

**Jennifer Tyler** (jntyler11@gmail.com), Broughton Magnet High School, Raleigh, NC

**Stephanie Bender** (@mrsbendersci; smbender33@gmail.com), Durant Road Middle School, Raleigh, NC

Leverage vertical integration of middle school and high school science concepts in order to enhance meaningful connections between branches of science at all levels.

### Memory, Attention, and Distraction

(Grades 9–12)

C201, GWCC

Science Focus: LS1.D, CCC2, SEP2

**Louisa Stark**, The University of Utah, Salt Lake City

What can games, a murder mystery, and a driving test demonstrate about neurophysiology? Explore brain anatomy, memory, and attention for free at [learn.genetics.utah.edu](http://learn.genetics.utah.edu).

### Developing and Using Models in Life Science

(Grades 6–12)

C203, GWCC

Science Focus: LS, CCC, SEP2

**Tracy Evans** (tracy\_evans@guwinnett.12.ga.us) and **Lisa Carnes** (@lisasmithcarnes; lisa\_carnes@gwinnett.k12.ga.us), Gwinnett County Public Schools, Suwanee, GA

What is an effective scientific model? Join us and experience how scientific models in life science can engage students and enhance three-dimensional learning.

### Advancing Children's Science Literacy and Knowledge Through Traditional Texts and Digital Media

(Grades K–2)

C205, GWCC

Science Focus: PS2, PS3

**Jean Crawford**, PBS, Arlington, VA

**Jeanne Paratore** (jparatore@bu.edu), Boston University, Boston, MA

**Alicia Poulin** (alicia.rmello@gmail.com), Devotion School, Brookline, MA

Discover how to create engaging science lessons using informational texts and digital media from PBS Kids, including the free creative coding app PBS KIDS ScratchJr.

### Scoring Gains in Health Literacy

(Grades 6–12)

C209, GWCC

Science Focus: GEN, SEP4, SEP7, SEP8

**Anne Westbrook** (awestbrook@bscs.org), BSCS, Colorado Springs, CO

Health literacy requires analyzing claims that may or may not be accurate. Come participate in activities that guide students in developing rubrics to make evidence-based decisions.

### Developing and Implementing Three-Dimensional Classroom Assessments

(Grades 6–12)

C210, GWCC

Science Focus: GEN, NGSS

**Nicole Page**, Houston County School District, Perry, GA

**Heather Toliver** (@MrsTolly; heather.toliver@henry.k12.ga.us), Henry County Schools, McDonough, GA

We will review exemplars and engage in a process to develop three-dimensional formative and summative classroom assessments used to gather evidence of student learning.



### Animal Multimedia Inspires Learning and Engagement

(Grades 6–12)

C211, GWCC

Science Focus: LS, PS, CCC, SEP

**Lindsay Glasner** (@BirdSleuth; [lig27@cornell.edu](mailto:lig27@cornell.edu)), The Cornell Lab of Ornithology, Ithaca, NY

See how easy it is to support STEM learning through animal multimedia using the free sound analysis program Raven Lite 2.0.

### Middle School Chemistry: Carbon Dioxide and Changes to the Ocean

(Grades 6–8)

C212, GWCC

Science Focus: PS1.B

**James Kessler**, American Chemical Society, Washington, DC

Conduct experiments from the free middle school science teaching resource [middleschoolchemistry.com](http://middleschoolchemistry.com) to show that excess carbon dioxide causes water to become more acidic.

### Using Authentic Ocean Data to Meet the NGSS

(Grades 4–College)

C302, GWCC

Science Focus: ESS2.A, ESS2.C, ESS2.D, LS1.C, LS2, PS1.A, PS1.B, PS4.A, CCC1, CCC3, CCC4, CCC5, CCC7, SEP4, SEP6, SEP7, SEP8

**Meghan Marrero** (@megmarrero; [mmarrero3@mercy.edu](mailto:mmarrero3@mercy.edu)), Mercy College, Dobbs Ferry Campus, Dobbs Ferry, NY

Learn how to incorporate freely available authentic ocean data, from animal tracks to physical and chemical readings, into your lessons to promote three-dimensional learning.

### Beyond the Laboratory Manual: Cell Phones and Selfies

(General)

Dogwood B, Omni

Science Focus: GEN

**Stephanie Blake** ([blakes@otc.edu](mailto:blakes@otc.edu)), OTC Middle College, Springfield, MO

Have your students learn the rules of nature using everyday household materials, capturing phenomena with cell phone tools, and learning to channel knowledge from the sea of information available. This adventure will nurture students' innate love-of-learning while also helping them to grow as individuals because it shows teachers how to teach science through students' two favorite things: cell phones and selfies.

### STEAM Up Your Surroundings

(Grades 8–12)

International Ballroom E, Omni

Science Focus: GEN

**Edmund Zuis** ([ed.zuis@rsu4.org](mailto:ed.zuis@rsu4.org)), Oak Hill High School, Sabattus, ME

**Dylan Thombs** ([dthombs@bates.edu](mailto:dthombs@bates.edu)), Bates College, Lewiston, ME

Place-based education empowers students to explore STEAM in their natural or community environment. Explore the pedagogy, hear our experiences, and get ideas for your communities.

### Tips and Tricks for Integrating Data, Data Science, and NGSS Science Practices into Any Science Classroom

(Grades 5–College)

Spruce, South Tower, Omni

Science Focus: GEN, CCC1, CCC7, SEP

**Kristin Hunter-Thomson** (@ru\_dataspire; [hunterthomson@marine.rutgers.edu](mailto:hunterthomson@marine.rutgers.edu)), Rutgers Cooperative Extension, Dataspire, New Brunswick, NJ

Explore our world of data, reflect on how people interact with data, and learn tips and tricks to integrate data successfully into your science classroom.

### 5:30–6:00 PM Presentations

#### The National Parks Meet NGSS

(Grades 5–12)

A303, GWCC

Science Focus: ESS, LS, CCC

**Kimberly Loomis** ([klloomis@kennesaw.edu](mailto:klloomis@kennesaw.edu)) and **Susan Collins**, Kennesaw State University, Kennesaw, GA

**Hope Smith** ([@ynphope](mailto:@ynphope); [hopepsmith@yahoo.com](mailto:hopepsmith@yahoo.com)), Dacula Elementary School, Dacula, GA

Teachers visited Yellowstone and Denali national parks, exploring park-related issues. The experience impacted and inspired practices. Resulting materials address preparing informed and engaged science learners.

#### An exCELLent Unit: Integrating STEM in Biology

(Grades 9–12)

C202, GWCC

Science Focus: LS, CCC6, SEP1, SEP2, SEP3, SEP4, SEP7, SEP8

**Ariel Lane** ([arielblane@gmail.com](mailto:arielblane@gmail.com)), KIPP Atlanta Collegiate, Atlanta, GA

Leave with ideas on how to incorporate ACT, NGSS, state biology, and AP biology standards for a Cells unit.

#### QUIT Teaching! Start Facilitating! Strategies for Creating a Student-Centered Learning Environment

(Grades 6–12)

C204, GWCC

Science Focus: GEN, SEP

**Dana Niblett** ([dniblett@dodge.k12.ga.us](mailto:dniblett@dodge.k12.ga.us)) and **Heather Cowart** ([hcameron123@gmail.com](mailto:hcameron123@gmail.com)), Dodge County High School, Eastman, GA

We will provide you with research-based strategies and tips that will transform your classroom from a “sit and get” environment to a student-centered/facilitator-based classroom.

#### Scientific Student Achievement Through Self Analysis and Reflection

(Grades 4–12)

C206, GWCC

Science Focus: GEN

**Olivia Swanson Jern** ([ojern@wayne.k12.ga.us](mailto:ojern@wayne.k12.ga.us)), **Melinda Chancey** ([mchancey@wayne.k12.ga.us](mailto:mchancey@wayne.k12.ga.us)), and **Missi Fountain** ([mfountain@wayne.k12.ga.us](mailto:mfountain@wayne.k12.ga.us)), Wayne County High School, Jesup, GA

Inspire all students toward a growth mind-set while increasing motivation and ownership through the use of student data notebooks.

#### Integrating the Engineering Design Process with Forces and Motion

(Grades 9–12)

C301, GWCC

Science Focus: ETS1, PS2

**Ashley Harlacher** ([aharlacher@phm.k12.in.us](mailto:aharlacher@phm.k12.in.us)), Penn High School, Mishawaka, IN

Hear how to teach and assess an engineering project in which students are challenged to build a machine that launches a penny.

#### The Many Many Things You Can Do with Google Classroom!

(Grades 5–College)

Dogwood A, Omni

Science Focus: GEN, SEP

**David Mwangi** ([@mwangida22](mailto:@mwangida22); [d.mwangi@eastorange.k12.nj.us](mailto:d.mwangi@eastorange.k12.nj.us)), East Orange (NJ) School District

Not using Google Classroom? Come see what you and your students are missing. Already using Google Classroom... then come learn new tricks that will improve communication and collaboration in your classroom

#### Setting Up and Maintaining a Statewide Science Curriculum Consortium to Produce, Review, and Evaluate Resources for NGSS

(General)

Magnolia, Omni

Science Focus: GEN, NGSS

**Tyson Grover** ([@GroverScience](mailto:@GroverScience); [tgrover@dsdmail.net](mailto:tgrover@dsdmail.net)), Davis School District, Clearfield, UT

**Matthew Patterson** ([@funguyscience](mailto:@funguyscience); [mpatterson@wsd.net](mailto:mpatterson@wsd.net)), Weber School District, Ogden, UT

Hear how to develop a curriculum consortium among science educators with the intent purpose of creating curriculum resources, student resources, professional development, and deeper understanding of the NGSS.

#### Research and Debate on the Evolution of Historical Science and Engineering Theories and Practices

(Grades 3–College)

Maple C, South Tower, Omni

Science Focus: GEN, SEP7, SEP8

**Kate Baird** ([@7350goldendreams](mailto:@7350goldendreams); [katebaird1430@gmail.com](mailto:katebaird1430@gmail.com)), STEMporium Educational Consulting, Columbus, IN  
**Stephanie Coy** ([sscoy@iupuc.edu](mailto:sscoy@iupuc.edu)), Orlando Science School-Technology, Orlando, FL

Engage your students in NGSS Practices 7 and 8. A spotlight is focused on the interaction between science/engineering discovery and cultural perspectives on the historical evolution of scientific thought through student research and debate.

### Personalized Learning: A Framework for Science

(Grades 1–12)

Walnut, Omni

Science Focus: GEN, SEP

**Daniel Carroll** ([thedancarroll@hotmail.com](mailto:thedancarroll@hotmail.com)), Yorktown High School, Arlington, VA

Come see how to transform your class from a static traditional model to a dynamic learning environment where all students are engaged and can succeed.

### 6:00–8:45 PM NSTA Teacher Awards Gala

(Tickets Required; \$80) #M-1 Grand Ballroom E, Omni

Come enjoy a fabulous evening celebrating with this year's teacher award recipients! ALL of the teacher awards will be presented in one grand evening. Join your colleagues in recognition of this year's winners. Evening attire is requested to honor our teacher award recipients.

Tickets, if still available, must be purchased in the Registration Area before 11:00 AM on Friday.

### 6:00–9:00 PM Film Screening

#### HHMI Movie Night

(Grades )

Sidney Marcus Auditorium, GWCC

Join HHMI for dinner and a special screening of the award-winning film *THE FARTHEST: Voyager in Space*, followed by a Q&A with four original members of NASA's famed Voyager mission. Dinner will be served promptly at 6:00 PM and screening begins at 6:30 PM.

*This event is FREE, but tickets are required, so please stop by the BioInteractive booth (#323) for tickets.*

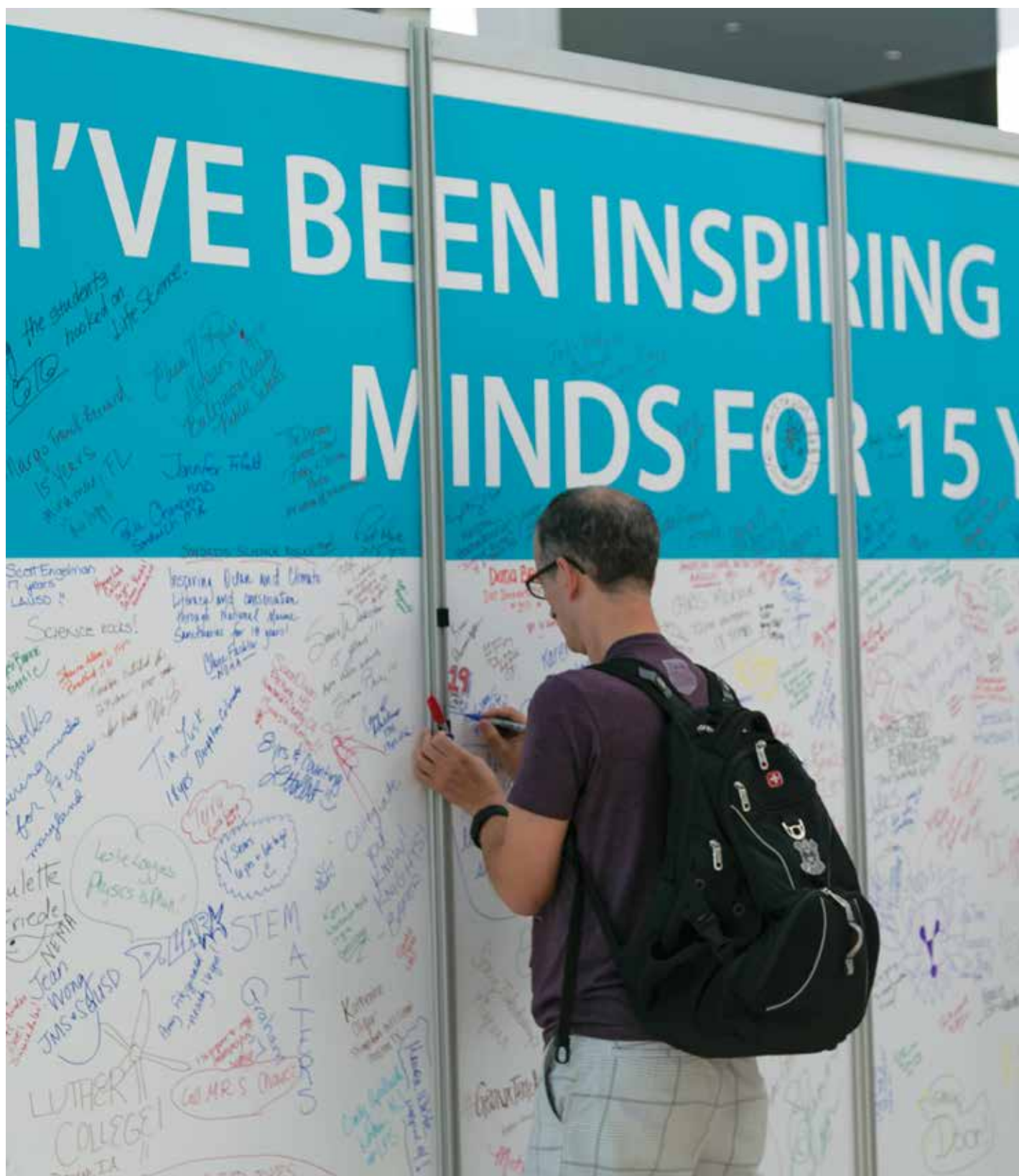
### 7:00–9:00 PM Networking Opportunity

#### SCST Dessert Social and Poster Session

Grand Ballroom B, Omni



—Photo courtesy of Mike Weiss



—Photo courtesy of Mike Weiss

## Friday, March 16

AMSE Alice J. Moses Annual Breakfast

By Invitation Only, visit [www.amsek16.org](http://www.amsek16.org),

Pine (South Tower), Omni..... 7:30–9:30 AM

NSTA President's International Breakfast Reception

Sponsored by Northrup Grumman Foundation

Open to international visitors and invited guests

Grand Blrm. E, Omni..... 8:30–9:30 AM

NSTA International Lounge

Cypress Room, Omni..... 9:00 AM–5:00 PM

Urban Science Education Advisory Board Meeting

Chestnut Room, Omni..... 10:30 AM–12 Noon

AMSE General Membership Meeting

Visit [amsek16.org](http://amsek16.org) for additional information.

Pine (South Tower), Omni..... 10:30 AM–12:30 PM

NMLSTA Membership and Board Meeting

By Invitation Only

A314, GWCC..... 12 Noon–12:30 PM

ASTE-Sponsored Working Meeting: Elementary Science Teaching Methods

Sycamore, Omni..... 12:30–1:30 PM

“Meet and Greet” the NSTA Presidents and Board/Council

Entrance to Exhibit Hall, Hall B2 ..... 12:45–1:30 PM

Chapter and Associated Group Leader Roundtable

Hazelnut, Omni..... 3:00–4:00 PM

GSTA Annual Meeting

By Invitation Only

Juniper, Omni..... 3:30–4:30 PM

SCST Business Meeting

Hickory, Omni ..... 3:30–5:00 PM

APAST Social and Business Meeting

By Invitation Only

Cottonwood A/B, Omni ..... 4:00–6:00 PM

NSTA Recommends Meeting

Visit [www.nsta.org/recommends](http://www.nsta.org/recommends)

Willow Brdrm., Omni ..... 4:30–5:30 PM

Shell Reception

By Invitation Only

Grand Blrm. A, Omni..... 5:00–5:45 PM

Reception for Georgia Science Teachers

By ticket through GSTA, visit [www.georgiascienceteacher.org](http://www.georgiascienceteacher.org)

Int'l Blrm. F, Omni ..... 5:00–6:00 PM

NSTA Teacher Awards Gala

(Ticket required: M-1)

Grand Blrm. E, Omni..... 6:00–8:45 PM

HHMI Movie Night: *The Farthest—Voyager in Space* by HHMI BioInteractive and HHMI Tangled Bank Studios

Separate registration (6 p.m. dinner and screening followed by inspiring panel featuring members of the original *Voyager* team)  
Stop by Booth #323 for free ticket.

Sidney Marcus Auditorium, GWCC ..... 6:00–9:00 PM

SCST Dessert Social and Poster Session

Grand Blrm. B, Omni..... 7:00–9:00 PM



## Index of Exhibitor Workshops

### 3D Molecular Designs LLC (Booth #731)

|                |              |            |                                                                               |
|----------------|--------------|------------|-------------------------------------------------------------------------------|
| Friday, Mar 16 | 4:00–5:30 PM | B403, GWCC | Get a Move On! Modeling Molecular Transport Across the Cell Membrane (p. 105) |
|----------------|--------------|------------|-------------------------------------------------------------------------------|

### A+ STEM Labs (Booth #1347)

|                |                 |            |                                |
|----------------|-----------------|------------|--------------------------------|
| Friday, Mar 16 | 12 Noon–1:30 PM | B218, GWCC | Making “STEM Available”(p. 62) |
|----------------|-----------------|------------|--------------------------------|

### AAAS Project 2061 (Booth #847)

|                |              |            |                                                                                     |
|----------------|--------------|------------|-------------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM | B215, GWCC | Toward High School Biology: Introducing a New Middle School Curriculum Unit (p. 25) |
|----------------|--------------|------------|-------------------------------------------------------------------------------------|

### Amplify (Booth #1723)

|                |                 |            |                                                                                                  |
|----------------|-----------------|------------|--------------------------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM    | B404, GWCC | Patterns in the Sky: Phenomena and 3-D Instruction for Grades K–1 (p. 28)                        |
| Friday, Mar 16 | 10:00–11:30 AM  | B404, GWCC | Establishing an Orangutan Reserve: Phenomena and 3-D Instruction for Grades 2–5 (p. 46)          |
| Friday, Mar 16 | 12 Noon–1:30 PM | B404, GWCC | Assessment for Learning in the Age of NGSS: Revealing Student Thinking and Taking Action (p. 64) |

### Animalearn (Booth #1245)

|                |              |            |                                                  |
|----------------|--------------|------------|--------------------------------------------------|
| Friday, Mar 16 | 2:00–3:30 PM | B404, GWCC | Take the Leap into the Frog-Friendly Lab (p. 91) |
|----------------|--------------|------------|--------------------------------------------------|

### Arbor Scientific (Booth #935)

|                |                |            |                                                                                |
|----------------|----------------|------------|--------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM   | B403, GWCC | May the Force Be With You (p. 28)                                              |
| Friday, Mar 16 | 10:00–11:30 AM | B403, GWCC | Seeing Is Believing: Physics Demonstrations to Energize Your Classroom (p. 46) |

### Bio-Rad Laboratories, Inc. (Booth #434)

|                |                |            |                                                                                        |
|----------------|----------------|------------|----------------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM   | B311, GWCC | Algae Blooms: Agriculture, Ecology, and Economy (p. 27)                                |
| Friday, Mar 16 | 8:00–9:30 AM   | B310, GWCC | Who’s the Panda Daddy? The Bear Facts (p. 27)                                          |
| Friday, Mar 16 | 10:00–11:30 AM | B310, GWCC | Fascinate Your Students with Glowing Bacteria (p. 45)                                  |
| Friday, Mar 16 | 10:00–11:30 AM | B311, GWCC | Math and Modeling Together! Improving Students’ Quantitative Skills in Biology (p. 46) |
| Friday, Mar 16 | 2:00–3:30 PM   | B310, GWCC | Get That Grant Money! (p. 90)                                                          |
| Friday, Mar 16 | 2:00–3:30 PM   | B311, GWCC | Lab Skills: The Escape Room! (p. 90)                                                   |
| Friday, Mar 16 | 4:00–5:30 PM   | B310, GWCC | Identify Patient Zero of a Zombie Apocalypse! (p. 105)                                 |
| Friday, Mar 16 | 4:00–5:30 PM   | B311, GWCC | Lab Skills: The Escape Room! (p. 105)                                                  |

### BIOZONE International, Ltd. (Booth #1427)

|                |                |            |                                                             |
|----------------|----------------|------------|-------------------------------------------------------------|
| Friday, Mar 16 | 10:00–11:30 AM | B406, GWCC | AP Biology: BIOZONE Showcases the New 2017 Editions (p. 46) |
|----------------|----------------|------------|-------------------------------------------------------------|

### Capitol Region Education Council (Booth #1709)

|                |                 |            |                                                  |
|----------------|-----------------|------------|--------------------------------------------------|
| Friday, Mar 16 | 12 Noon–1:30 PM | B408, GWCC | Catalyzing Your NGSS Implementation K–12 (p. 64) |
|----------------|-----------------|------------|--------------------------------------------------|

## Carolina Biological Supply Co. (Booth #607)

|                |                 |            |                                                                                             |
|----------------|-----------------|------------|---------------------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM    | B201, GWCC | Planning and Designing Investigations Using Balanced and Unbalanced Forces (p. 24)          |
| Friday, Mar 16 | 8:00–9:30 AM    | B204, GWCC | Arriving on the Scene: Collect and Analyze Evidence Like the Pros (p. 25)                   |
| Friday, Mar 16 | 8:00–9:30 AM    | B202, GWCC | Comparative Mammalian Organ Dissection with Carolina's Perfect Solution® Specimens (p. 24)  |
| Friday, Mar 16 | 10:00–11:30 AM  | B204, GWCC | Hands-On Activities to Model Sampling, Habitat Degradation, and Animal Choice (p. 43)       |
| Friday, Mar 16 | 10:00–11:30 AM  | B201, GWCC | Plants, Bessbugs, and Squid: Build Understanding of Structure and Function (p. 42)          |
| Friday, Mar 16 | 10:00–11:30 AM  | B202, GWCC | Comparative Vertebrate Anatomy with Carolina's Perfect Solution® Specimens (p. 42)          |
| Friday, Mar 16 | 12 Noon–1:30 PM | B202, GWCC | Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher (p. 61) |
| Friday, Mar 16 | 12 Noon–1:30 PM | B201, GWCC | Shifting to the Five Innovations: Density Phenomena (p. 61)                                 |
| Friday, Mar 16 | 12 Noon–1:30 PM | B204, GWCC | They Come in Pairs: Addressing Student Misconceptions About Chromosomes (p. 61)             |
| Friday, Mar 16 | 2:00–3:30 PM    | B202, GWCC | Protein Necklace: Harnessing the Glow of Jellyfish (p. 87)                                  |
| Friday, Mar 16 | 2:00–3:30 PM    | B204, GWCC | Hands-On Science with Classroom Critters (p. 88)                                            |
| Friday, Mar 16 | 2:00–3:30 PM    | B201, GWCC | Smithsonian Engineering: Sending Coded Messages Using Sound (p. 87)                         |
| Friday, Mar 16 | 4:00–5:30 PM    | B204, GWCC | Clean Up Your Mess! (p. 103)                                                                |
| Friday, Mar 16 | 4:00–5:30 PM    | B202, GWCC | Shark Dissection: A Jawsome Experience! (p. 102)                                            |

## Celeston (Booth #903)

|                |              |            |                                                                                                 |
|----------------|--------------|------------|-------------------------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM | B217, GWCC | Different Isn't Bad: Using Arthropods to Teach About Science, Society, and Being a Teen (p. 26) |
|----------------|--------------|------------|-------------------------------------------------------------------------------------------------|

## CPO Science/School Specialty Science (Booth #531)

|                |                 |            |                                                                         |
|----------------|-----------------|------------|-------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM    | B303, GWCC | Wind Turbines: A STEM Approach to Engineering and Design (p. 26)        |
| Friday, Mar 16 | 10:00–11:30 AM  | B303, GWCC | Go on a Cell Quest! Teaching Cell Structure Through Gaming (p. 45)      |
| Friday, Mar 16 | 12 Noon–1:30 PM | B303, GWCC | Collisions and Restraints: Solving Problems Through Engineering (p. 63) |
| Friday, Mar 16 | 2:00–3:30 PM    | B303, GWCC | Are You Crazy About Genetics? (p. 89)                                   |

## Delta Education/School Specialty Science–FOSS (Booth #531)

|                |                 |            |                                                                               |
|----------------|-----------------|------------|-------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM    | B302, GWCC | Engage Students in FOSS Next Generation K–5 (p. 26)                           |
| Friday, Mar 16 | 10:00–11:30 AM  | B302, GWCC | What Do Crosscutting Concepts Look Like in a Elementary Classroom (p. 45)     |
| Friday, Mar 16 | 12 Noon–1:30 PM | B302, GWCC | What Do Crosscutting Concepts Look Like in a Middle School Classroom? (p. 62) |
| Friday, Mar 16 | 2:00–3:30 PM    | B302, GWCC | Developing Models for Sensory Receptors (p. 89)                               |
| Friday, Mar 16 | 4:00–5:30 PM    | B302, GWCC | Evolutionary Evidence in the Fossil Record (p. 104)                           |

## Educational Innovations (Booth #1213)

|                |                 |            |                                                                          |
|----------------|-----------------|------------|--------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM    | B313, GWCC | Cool! Can We Do That Again?! (p. 27)                                     |
| Friday, Mar 16 | 10:00–11:30 AM  | B313, GWCC | Fantastical Chemistry Demos for All Classrooms (p. 46)                   |
| Friday, Mar 16 | 12 Noon–1:30 PM | B313, GWCC | 3-2-1 Blast Off! (p. 63)                                                 |
| Friday, Mar 16 | 2:00–3:30 PM    | B313, GWCC | Elementary Teacher Survival Kit (p. 90)                                  |
| Friday, Mar 16 | 4:00–5:30 PM    | B313, GWCC | STEAM Meets IoT: Code Your Own Autonomous Vehicle with SAM Labs (p. 105) |

## ETA hand2mind (Booth #1842)

|                |                 |            |                                              |
|----------------|-----------------|------------|----------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM    | B213, GWCC | Get Hands-On with STEM (p. 25)               |
| Friday, Mar 16 | 12 Noon–1:30 PM | B213, GWCC | STEM Bins®: Engineering Through Play (p. 62) |

## Index of Exhibitor Workshops

### Exploring Physics (Booth #934)

|                |                 |            |                                                                                                   |
|----------------|-----------------|------------|---------------------------------------------------------------------------------------------------|
| Friday, Mar 16 | 12 Noon–1:30 PM | B217, GWCC | Inquiry and Modeling-Based Digital Curriculum App for Conceptual Physics/Physical Science (p. 62) |
|----------------|-----------------|------------|---------------------------------------------------------------------------------------------------|

### Fisher Science Education (Booth #543)

|                |                 |            |                                                                                      |
|----------------|-----------------|------------|--------------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM    | B306, GWCC | STEM Design Challenge (p. 26)                                                        |
| Friday, Mar 16 | 10:00–11:30 AM  | B306, GWCC | The Chemistry of Glow Sticks (p. 45)                                                 |
| Friday, Mar 16 | 12 Noon–1:30 PM | B306, GWCC | Application of Presumptive Tests for Blood to Physical Evidence (p. 63)              |
| Friday, Mar 16 | 2:00–3:30 PM    | B306, GWCC | Changing Perceptions on Climate Change Through Citizen Science and Phenology (p. 90) |

### Flinn Scientific, Inc. (Booth #1022)

|                |                 |            |                                                                                          |
|----------------|-----------------|------------|------------------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM    | B203, GWCC | Fantastic Physical Science Demonstrations from Flinn Scientific (p. 24)                  |
| Friday, Mar 16 | 10:00–11:30 AM  | B203, GWCC | Support Your Students in Their Scientific Journey with Flinn's Digital Resources (p. 42) |
| Friday, Mar 16 | 12 Noon–1:30 PM | B203, GWCC | Dynamic Demonstrations from Flinn Scientific (p. 61)                                     |
| Friday, Mar 16 | 2:00–3:30 PM    | B203, GWCC | Green Chemistry Experiments for General and AP Chemistry (p. 87)                         |
| Friday, Mar 16 | 4:00–5:30 PM    | B203, GWCC | Flipping AP Biology with FlinnPREP™ (p. 102)                                             |

### FLIR® Systems, Inc. (Booth #730)

|                |              |            |                                                                |
|----------------|--------------|------------|----------------------------------------------------------------|
| Friday, Mar 16 | 4:00–5:30 PM | B214, GWCC | See Science in a Whole New Light with Thermal Imaging (p. 103) |
|----------------|--------------|------------|----------------------------------------------------------------|

### Frey Scientific/School Specialty Science (Booth #531)

|                |              |            |                                                                      |
|----------------|--------------|------------|----------------------------------------------------------------------|
| Friday, Mar 16 | 4:00–5:30 PM | B303, GWCC | Makerspace Strategies and Solutions for the Secondary Level (p. 104) |
|----------------|--------------|------------|----------------------------------------------------------------------|

### HHMI BioInteractive (Booth #323)

|                |                 |            |                                                                               |
|----------------|-----------------|------------|-------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM    | B308, GWCC | Scientists at Work: Bringing Science to Life with HHMI BioInteractive (p. 27) |
| Friday, Mar 16 | 10:00–11:30 AM  | B308, GWCC | Biology and Geology: Co-Evolving Over Time (p. 45)                            |
| Friday, Mar 16 | 12 Noon–1:30 PM | B308, GWCC | Alzheimer's to Zoonosis: Using Disease to Teach Data Analysis (p. 63)         |
| Friday, Mar 16 | 2:00–3:30 PM    | B308, GWCC | BioInteractive Scientists at Work Integrates NGSS Practices! (p. 90)          |
| Friday, Mar 16 | 4:00–5:30 PM    | B308, GWCC | Exploring Trophic Cascades with HHMI BioInteractive Resources (p. 105)        |

### Houghton Mifflin Harcourt (Booth #1110)

|                |                 |            |                                                                                                                       |
|----------------|-----------------|------------|-----------------------------------------------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM    | B314, GWCC | Claims, Evidence, and Reasoning in Action (p. 27)                                                                     |
| Friday, Mar 16 | 10:00–11:30 AM  | B314, GWCC | An NGSS Approach to Challenging Concepts in Chemistry (p. 46)                                                         |
| Friday, Mar 16 | 12 Noon–1:30 PM | B314, GWCC | From Big Bird to Bird Brains: Modeling Structure and Function in Biology with Help from Our Feathered Friends (p. 63) |

### Insurance Institute for Highway Safety (Booth #1307)

|                |              |            |                                                                                |
|----------------|--------------|------------|--------------------------------------------------------------------------------|
| Friday, Mar 16 | 2:00–3:30 PM | B407, GWCC | Crash Science Website Launched! Free STEM Activities, Videos, and More (p. 92) |
|----------------|--------------|------------|--------------------------------------------------------------------------------|

### JASON Learning (Booth #750)

|                |              |            |                                                                           |
|----------------|--------------|------------|---------------------------------------------------------------------------|
| Friday, Mar 16 | 4:00–5:30 PM | B218, GWCC | JASON Learning Inspiring All Learners, Building STEM Communities (p. 104) |
|----------------|--------------|------------|---------------------------------------------------------------------------|

## Lab-Aids, Inc. (Booth #723)

|                |                 |            |                                                  |
|----------------|-----------------|------------|--------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM    | B305, GWCC | Photosynthesis and Respiration Shuffle (p. 26)   |
| Friday, Mar 16 | 10:00–11:30 AM  | B305, GWCC | Cell Differentiation and Gene Expression (p. 45) |
| Friday, Mar 16 | 12 Noon–1:30 PM | B305, GWCC | What Is a Species? (p. 63)                       |
| Friday, Mar 16 | 2:00–3:30 PM    | B305, GWCC | Chemical Formula and Amino Acids (p. 89)         |
| Friday, Mar 16 | 4:00–5:30 PM    | B305, GWCC | pH Scale (p. 104)                                |

## LaMotte Co. (Booth #815)

|                |              |            |                                                          |
|----------------|--------------|------------|----------------------------------------------------------|
| Friday, Mar 16 | 2:00–3:30 PM | B218, GWCC | Stream Ecology: Slimy Leaves for Healthy Streams (p. 89) |
|----------------|--------------|------------|----------------------------------------------------------|

## LEGO Education (Booth #1122)

|                |                |            |                                                                                                    |
|----------------|----------------|------------|----------------------------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM   | B409, GWCC | Integrating Robotics into Your Science Classroom (Grades 5+) (p. 28)                               |
| Friday, Mar 16 | 10:00–11:30 AM | B409, GWCC | Gears, Wheels, Axles, Levers, and Pulleys: How Do They Lay the Foundation for Robotics? (p. 47)    |
| Friday, Mar 16 | 1:00–2:30 PM   | B409, GWCC | Use Science, Coding, and Robotics in the Elementary Classroom to Solve Real-World Problems (p. 77) |
| Friday, Mar 16 | 3:00–4:30 PM   | B409, GWCC | Explore Renewable Energy with Hands-On Activities (p. 93)                                          |

## McGraw-Hill Education (Booth #635)

|                |                |            |                                                                    |
|----------------|----------------|------------|--------------------------------------------------------------------|
| Friday, Mar 16 | 10:00–11:30 AM | B213, GWCC | AP Biology Unwrapped: Discover the Keys to AP Exam Success (p. 44) |
| Friday, Mar 16 | 2:00–3:30 PM   | B312, GWCC | Science Vocabulary Has Kinetic Energy When It's Moving (p. 90)     |

## Measured Progress (Booth #432)

|                |                |            |                                                            |
|----------------|----------------|------------|------------------------------------------------------------|
| Friday, Mar 16 | 10:00–11:30 AM | B218, GWCC | Unpacking the NGSS Through Instructional Practices (p. 44) |
|----------------|----------------|------------|------------------------------------------------------------|

## Minecraft Education (Booth #1516)

|                |              |            |                                             |
|----------------|--------------|------------|---------------------------------------------|
| Friday, Mar 16 | 2:00–3:30 PM | B314, GWCC | How to Teach Science with Minecraft (p. 90) |
|----------------|--------------|------------|---------------------------------------------|

## molymod models, Spiring Ltd. (Booth #843)

|                |                |            |                                                                                                                |
|----------------|----------------|------------|----------------------------------------------------------------------------------------------------------------|
| Friday, Mar 16 | 10:00–11:30 AM | B214, GWCC | Using Molymod Model Kits to Enhance Instruction in Biology “the Building Blocks of Life” and Chemistry (p. 44) |
|----------------|----------------|------------|----------------------------------------------------------------------------------------------------------------|

## Monsanto Co. (Booth #912)

|                |                |            |                                                                                                                                      |
|----------------|----------------|------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM   | B312, GWCC | Grow GMO Seeds in Your Classroom, Conduct Protein and DNA Analyses Using Lateral Flow Strips and PCR (p. 27)                         |
| Friday, Mar 16 | 10:00–11:30 AM | B312, GWCC | GMOs a Hot Topic in the Media, Classroom, and Around the Dinner Table: Panel Discussion and Presentation by Monsanto Company (p. 46) |

## MSOE Center for BioMolecular Modeling (Booth #729)

|                |                 |            |                                                                            |
|----------------|-----------------|------------|----------------------------------------------------------------------------|
| Friday, Mar 16 | 12 Noon–1:30 PM | B403, GWCC | Take a Walk through the Molecular World with Watercolor Landscapes (p. 64) |
| Friday, Mar 16 | 2:00–3:30 PM    | B403, GWCC | Keep Your Head Above Water with Magnetic Water Molecule Models (p. 91)     |

## Index of Exhibitor Workshops

### Nanolive SA (Booth #1814)

|                |              |            |                               |
|----------------|--------------|------------|-------------------------------|
| Friday, Mar 16 | 4:00–5:30 PM | B408, GWCC | Explore Cells in 3D! (p. 106) |
|----------------|--------------|------------|-------------------------------|

### NaRiKa Corp. (Booth #942)

|                |              |            |                                                          |
|----------------|--------------|------------|----------------------------------------------------------|
| Friday, Mar 16 | 4:00–5:30 PM | B215, GWCC | Hands-On Approach to Teach Electricity in Japan (p. 103) |
|----------------|--------------|------------|----------------------------------------------------------|

### National Geographic Learning | Cengage (Booth #1142)

|                |              |            |                                                                                   |
|----------------|--------------|------------|-----------------------------------------------------------------------------------|
| Friday, Mar 16 | 2:00–3:30 PM | B408, GWCC | Bringing the World into Your Classroom with National Geographic Explorers (p. 92) |
|----------------|--------------|------------|-----------------------------------------------------------------------------------|

### National Geographic Society (Booth #1143)

|                |              |            |                                                               |
|----------------|--------------|------------|---------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM | B406, GWCC | Become a National Geographic Certified Educator (p. 28)       |
| Friday, Mar 16 | 4:00–5:30 PM | B404, GWCC | National Geographic's Geo-Inquiry Process in Action! (p. 105) |

### National Institute for STEM Education (Booth #833)

|                |               |            |                                                               |
|----------------|---------------|------------|---------------------------------------------------------------|
| Friday, Mar 16 | 9:30–10:30 AM | B301, GWCC | Science Teacher/ STEM Teacher: What's the Difference? (p. 40) |
|----------------|---------------|------------|---------------------------------------------------------------|

### National Nanotechnology Coordination Office (Booth #136)

|                |              |            |                                                                                                                        |
|----------------|--------------|------------|------------------------------------------------------------------------------------------------------------------------|
| Friday, Mar 16 | 4:00–5:30 PM | B217, GWCC | Bringing Standards-Based Nanotechnology Lessons into the Secondary Science Classroom: Addressing 3-D Learning (p. 104) |
|----------------|--------------|------------|------------------------------------------------------------------------------------------------------------------------|

### Operation Wallacea Ltd. (Booth #337)

|                |                 |            |                                                                                                    |
|----------------|-----------------|------------|----------------------------------------------------------------------------------------------------|
| Friday, Mar 16 | 12 Noon–1:30 PM | B214, GWCC | Conservation Research Through Academic Partnerships: Discovering New Species with Students (p. 62) |
|----------------|-----------------|------------|----------------------------------------------------------------------------------------------------|

### PASCO scientific (Booth #909)

|                |                  |            |                                                                               |
|----------------|------------------|------------|-------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:00 AM     | B316, GWCC | Made Easy: How to Untangle Electric Circuits (p. 24)                          |
| Friday, Mar 16 | 8:00–9:00 AM     | B315, GWCC | Hands-On: Model Watersheds and Human Impacts (p. 24)                          |
| Friday, Mar 16 | 9:30–10:30 AM    | B315, GWCC | Hands-On: Strategies to Teach Adaptations (p. 40)                             |
| Friday, Mar 16 | 9:30–10:30 AM    | B316, GWCC | Crash Barrier: How to Design a STEM Engineering Challenge (p. 40)             |
| Friday, Mar 16 | 11:00 AM–12 Noon | B316, GWCC | Enlighten Your Optics, Color, and Light Unit (p. 60)                          |
| Friday, Mar 16 | 11:00 AM–12 Noon | B315, GWCC | Stoichiometry: Tools and Strategies that Make It Easier to Teach (p. 60)      |
| Friday, Mar 16 | 12:30–1:30 PM    | B315, GWCC | What's in the Water? Colorimetry and Conductivity of Solutions (p. 74)        |
| Friday, Mar 16 | 12:30–1:30 PM    | B316, GWCC | Use Free GIS to Launch Weather Units into the Stratosphere (p. 74)            |
| Friday, Mar 16 | 2:00–3:00 PM     | B316, GWCC | Hands-On: Modeling Ocean Acidification (p. 87)                                |
| Friday, Mar 16 | 2:00–3:00 PM     | B315, GWCC | Use Better Models to Teach Protein Synthesis (p. 87)                          |
| Friday, Mar 16 | 3:30–4:30 PM     | B315, GWCC | Use Data to Slay Misconceptions about Photosynthesis and Respiration (p. 101) |
| Friday, Mar 16 | 3:30–4:30 PM     | B316, GWCC | STEM Activity: Better Bridge Building! (p. 101)                               |

### PBS LearningMedia /WGBH (Booth #1132)

|                |                |            |                                                                                                               |
|----------------|----------------|------------|---------------------------------------------------------------------------------------------------------------|
| Friday, Mar 16 | 10:00–11:30 AM | B217, GWCC | Big Data in the Classroom: Teaching About Earth with Authentic Data for Middle School and High School (p. 44) |
|----------------|----------------|------------|---------------------------------------------------------------------------------------------------------------|



## Pearson Education (Booth #222)

|                |                  |            |                                                                                                                                   |
|----------------|------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:00 AM     | B216, GWCC | littleBits in Grades 3–8 STEM Classrooms (p. 24)                                                                                  |
| Friday, Mar 16 | 9:30–10:30 AM    | B216, GWCC | Ideas for Teaching About Earthquakes and Earth Structure in an NGSS Classroom (p. 40)                                             |
| Friday, Mar 16 | 11:00 AM–12 Noon | B216, GWCC | Incorporating the NGSS Crosscutting Concepts into Your Teaching (p. 59)                                                           |
| Friday, Mar 16 | 12:30–1:30 PM    | B216, GWCC | From CRISPR to Three-Parent Babies and Back Again: What to Tell Our Students About the Coming Revolution in Human Biology (p. 73) |
| Friday, Mar 16 | 2:00–3:00 PM     | B216, GWCC | Science Denial: Where Does It Come From? What Can Science Educators Do About It? (p. 86)                                          |
| Friday, Mar 16 | 3:30–4:30 PM     | B216, GWCC | Using Problem-Based Learning to Up Your NGSS Game (p. 101)                                                                        |

## Perimeter Institute for Theoretical Physics (Booth #1050)

|                |                 |            |                                                             |
|----------------|-----------------|------------|-------------------------------------------------------------|
| Friday, Mar 16 | 10:00–11:30 AM  | B215, GWCC | Spicing Up Classical Physics (p. 44)                        |
| Friday, Mar 16 | 12 Noon–1:30 PM | B215, GWCC | Visualizing Energy for Deeper Student Understanding (p. 62) |

## PlayMada Games (Booth #1037)

|                |              |            |                                                                   |
|----------------|--------------|------------|-------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM | B218, GWCC | Inquiry in the Chemistry Classroom: A Game-Based Approach (p. 26) |
|----------------|--------------|------------|-------------------------------------------------------------------|

## PowerUpEDU (Booth #443)

|                |              |            |                                                                           |
|----------------|--------------|------------|---------------------------------------------------------------------------|
| Friday, Mar 16 | 2:00–3:30 PM | B406, GWCC | Make Science Relevant and Engaging Featuring a Mobile Data Logger (p. 92) |
|----------------|--------------|------------|---------------------------------------------------------------------------|

## Scholastic, Inc. (Booth #1031)

|                |              |            |                                                                           |
|----------------|--------------|------------|---------------------------------------------------------------------------|
| Friday, Mar 16 | 2:00–3:30 PM | B214, GWCC | Science Magazines: Where Literacy Meets Phenomenon-Based Learning (p. 88) |
|----------------|--------------|------------|---------------------------------------------------------------------------|

## Simulation Curriculum (Booth #1247)

|                |                |            |                                               |
|----------------|----------------|------------|-----------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM   | B408, GWCC | Extreme Weather (p. 28)                       |
| Friday, Mar 16 | 10:00–11:30 AM | B408, GWCC | A Close Encounter with the Red Planet (p. 47) |

## Space Station Explorers/CASIS (Booth #1750)

|                |                 |            |                                                                                                     |
|----------------|-----------------|------------|-----------------------------------------------------------------------------------------------------|
| Friday, Mar 16 | 12 Noon–1:30 PM | B406, GWCC | Space Station Explorers: Explore the Partner Programs that Take Science Education to SPACE! (p. 64) |
|----------------|-----------------|------------|-----------------------------------------------------------------------------------------------------|

## STEMscopes (Booth #823)

|                |                  |            |                                                                                              |
|----------------|------------------|------------|----------------------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:00 AM     | B301, GWCC | STEMrangers: Making Science Night Meaningful (p. 24)                                         |
| Friday, Mar 16 | 11:00 AM–12 Noon | B301, GWCC | Using Argumentation for Discussing Phenomena and Increasing Student Voice about STEM (p. 59) |
| Friday, Mar 16 | 12:30–1:30 PM    | B301, GWCC | Demystifying Phenomenon: Earthquake-Proof Towers and Engineering Design (p. 73)              |
| Friday, Mar 16 | 2:00–3:00 PM     | B301, GWCC | DIVE-in Engineering: New Ideas for the Maker Movement (p. 87)                                |
| Friday, Mar 16 | 3:30–4:30 PM     | B301, GWCC | STEM Literacy Strategies for Making Science Concepts Comprehensible (p. 101)                 |

## STEMy Stuff (Booth #650)

|                |              |            |                                              |
|----------------|--------------|------------|----------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM | B214, GWCC | Rock the NGSS with Electric Guitars! (p. 25) |
|----------------|--------------|------------|----------------------------------------------|

## Index of Exhibitor Workshops

### TCI (Booth #1343)

|                |                 |            |                                                                |
|----------------|-----------------|------------|----------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM    | B209, GWCC | Science and Engineering Practices in the NGSS (p. 25)          |
| Friday, Mar 16 | 10:00–11:30 AM  | B209, GWCC | Three-Dimensional Learning in the Elementary Classroom (p. 44) |
| Friday, Mar 16 | 12 Noon–1:30 PM | B209, GWCC | Integrating Crosscutting Concepts into Your Classroom (p. 61)  |
| Friday, Mar 16 | 2:00–3:30 PM    | B209, GWCC | Engineering Design in the NGSS (p. 88)                         |
| Friday, Mar 16 | 4:00–5:30 PM    | B209, GWCC | Performance Assessments: Engaging and Fun! (p. 103)            |

### Texas Instruments (Booth #223)

|                |              |            |                              |
|----------------|--------------|------------|------------------------------|
| Friday, Mar 16 | 2:00–3:30 PM | B213, GWCC | When Zombies Attack! (p. 88) |
| Friday, Mar 16 | 4:00–5:30 PM | B213, GWCC | Are You Moody? (p. 103)      |

### University of Delaware Food Science (Booth #1536)

|                |              |            |                                                                        |
|----------------|--------------|------------|------------------------------------------------------------------------|
| Friday, Mar 16 | 2:00–3:30 PM | B217, GWCC | Sustainable and Safe Food and Water for Engaging STEM Students (p. 89) |
|----------------|--------------|------------|------------------------------------------------------------------------|

### Vaccine Education Center at Children’s Hospital of Philadelphia (Booth #343)

|                |                |            |                                                                                             |
|----------------|----------------|------------|---------------------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM   | B407, GWCC | Inspiring Individuals and Changing Conversations: Consider Hosting a Film Screening (p. 28) |
| Friday, Mar 16 | 10:00–11:30 AM | B407, GWCC | The Science of Vaccines: Your Questions Answered (p. 47)                                    |

### Van Andel Education Institute (Booth #1529)

|                |              |            |                                                                         |
|----------------|--------------|------------|-------------------------------------------------------------------------|
| Friday, Mar 16 | 2:00–3:30 PM | B215, GWCC | Stop Creating Lesson Plans: Start Creating Learning Experiences (p. 88) |
|----------------|--------------|------------|-------------------------------------------------------------------------|

### Vernier Software & Technology (Booth #523)

|                |                 |            |                                                                          |
|----------------|-----------------|------------|--------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM    | B208, GWCC | Advanced Physics with Vernier (p. 25)                                    |
| Friday, Mar 16 | 8:00–9:30 AM    | B207, GWCC | Water Quality with Vernier (p. 25)                                       |
| Friday, Mar 16 | 10:00–11:30 AM  | B207, GWCC | Chemistry with Vernier (p. 43)                                           |
| Friday, Mar 16 | 10:00–11:30 AM  | B208, GWCC | Explore Motion with Vernier Video Physics for iOS (p. 43)                |
| Friday, Mar 16 | 12 Noon–1:30 PM | B207, GWCC | Biology with Vernier Using Chromebook (p. 61)                            |
| Friday, Mar 16 | 12 Noon–1:30 PM | B208, GWCC | Inquiry Physics Experiments from Vernier: No Lab Setup Required! (p. 61) |
| Friday, Mar 16 | 2:00–3:30 PM    | B207, GWCC | AP Chemistry with Vernier (p. 88)                                        |
| Friday, Mar 16 | 2:00–3:30 PM    | B208, GWCC | Physics with Vernier (p. 88)                                             |
| Friday, Mar 16 | 4:00–5:30 PM    | B207, GWCC | Biology with Vernier (p. 103)                                            |
| Friday, Mar 16 | 4:00–5:30 PM    | B208, GWCC | Renewable Energy with KidWind and Vernier (p. 103)                       |

### Ward’s Science (Booth #1323)

|                |                 |            |                                                                                |
|----------------|-----------------|------------|--------------------------------------------------------------------------------|
| Friday, Mar 16 | 8:00–9:30 AM    | B304, GWCC | Set the Scene for Science Discovery with Forensics (p. 26)                     |
| Friday, Mar 16 | 10:00–11:30 AM  | B304, GWCC | NGSS Curriculum Made Easy with Discovery Education™ and Ward’s Science (p. 45) |
| Friday, Mar 16 | 12 Noon–1:30 PM | B304, GWCC | Comparative Anatomy of a Grant (p. 63)                                         |
| Friday, Mar 16 | 2:00–3:30 PM    | B304, GWCC | Lead a STEM Revolution at Your School with Science Olympiad (p. 89)            |
| Friday, Mar 16 | 4:00–5:30 PM    | B304, GWCC | Georgia on My Brain: Hands-On Neuroscience Labs (p. 104)                       |



—Photo courtesy of Jacob Slaton

## Earth and Space Science: Friday

|                  |      |                      |                                                                                                                                                   |
|------------------|------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 8:00–8:30 AM     | 6–10 | A404, GWCC           | Using Project-Based Learning to Stop Ocean Plastic Pollution (p. 15)                                                                              |
| 8:00–9:00 AM     | 6–8  | C206, GWCC           | 3-D Learning Through NASA Orion Missions (p. 18)                                                                                                  |
| 8:00–9:00 AM     | G    | A311, GWCC           | Fake News! Helping Students Understand the Process of Science (p. 16)                                                                             |
| 8:00–9:00 AM     | 2–8  | A407, GWCC           | Integrating Science and Math Through Citizen Science: MMSA's WeatherBlur Program (p. 17)                                                          |
| 8:00–9:00 AM     | 6–8  | B315, GWCC           | Hands-On: Model Watersheds and Human Impacts (p. 24)                                                                                              |
| 8:00–9:00 AM     | 3–12 | A412a, GWCC          | Freshwater Stewardship: Equip Your Student-Scientists with Cutting-Edge Resources from NOAA (p. 17)                                               |
| 8:00–9:00 AM     | K–C  | A303, GWCC           | Let's Eradicate Mosquito-Borne Diseases! Join a Global Citizen Science Effort to Achieve This! (p. 16)                                            |
| 8:00–9:00 AM     | 6–9  | A301, GWCC           | Precipitating Change: Embedding Weather into the Middle School Science Classroom (p. 16)                                                          |
| 8:00–9:00 AM     | 6–C  | A302, GWCC           | STEM from the Stratosphere: Activities in the Infrared (p. 20)                                                                                    |
| 8:00–9:00 AM     | 3–12 | B405, GWCC           | NSTA Press® Session: Big Data, Small Devices (p. 17)                                                                                              |
| 8:00–9:00 AM     | K–12 | B102, GWCC           | NESTA and <i>Climate.gov</i> : Decoding Global Temperature and Carbon Dioxide Levels from a Model Ice Core (p. 21)                                |
| 8:00–9:30 AM     | K–1  | B404, GWCC           | Patterns in the Sky: Phenomena and 3-D Instruction for Grades K–1 (p. 28)                                                                         |
| 8:00–9:30 AM     | 7–C  | B207, GWCC           | Water Quality with Vernier (p. 25)                                                                                                                |
| 8:00–9:30 AM     | G    | B406, GWCC           | Become a National Geographic Certified Educator (p. 28)                                                                                           |
| 8:00–9:30 AM     | P–5  | B213, GWCC           | Get Hands-On with STEM (p. 25)                                                                                                                    |
| 8:00–9:30 AM     | 5–12 | B408, GWCC           | Extreme Weather (p. 28)                                                                                                                           |
| 8:00–11:00 AM    | K–12 | Chastain I/J, Westin | SC-6: Citizen Science Projects That Transform Schoolyards into STEM Labs and Help K–12 Students Make Sense of Phenomena in Nature (p. 29)         |
| 8:30–9:00 AM     | 5–C  | C202, GWCC           | The Science of Plants in Fiction, Poetry, and the Movies (p. 30)                                                                                  |
| 9:30–10:00 AM    | 7–12 | C205, GWCC           | Citizen Science Ecosystem Biodiversity in United States and Abroad (with Lemurs!) (p. 32)                                                         |
| 9:30–10:30 AM    | 6–12 | B216, GWCC           | Ideas for Teaching About Earthquakes and Earth Structure in an NGSS Classroom (p. 40)                                                             |
| 9:30–10:30 AM    | 5–12 | A412a, GWCC          | Data Is Not a Four Letter Word: Use NOAA Resources to Build Student Proficiency in Data Analysis (p. 34)                                          |
| 9:30–10:30 AM    | K–12 | A303, GWCC           | Protecting the Outer Space Environment (p. 33)                                                                                                    |
| 9:30–10:30 AM    | 6–8  | A402, GWCC           | The Ring of Fire: Planning a Model-Based Inquiry Unit Around a Puzzling Phenomenon (p. 33)                                                        |
| 9:30–10:30 AM    | K–C  | A302, GWCC           | Holistic STEM: A Community of Sharing Ground Cloud Observations and Comparing with NASA Satellite Data (p. 37)                                    |
| 9:30–10:30 AM    | 6–12 | C209, GWCC           | Revisiting Assessments with Scientific Discourse and Argumentation (p. 38)                                                                        |
| 9:30–10:30 AM    | 3–8  | A316, GWCC           | STEM Competition: Two Grade 4 Classes and a Unit on Energy (p. 37)                                                                                |
| 9:30–10:30 AM    | K–C  | B103, GWCC           | NESTA and AMS Share: Using Core Concepts to Build a Robust Earth System Science Foundation (p. 34)                                                |
| 10:00–11:30 AM   | 2–5  | B404, GWCC           | Establishing an Orangutan Reserve: Phenomena and 3-D Instruction for Grades 2–5 (p. 46)                                                           |
| 10:00–11:30 AM   | 6–12 | B217, GWCC           | Big Data in the Classroom: Teaching About Earth with Authentic Data for Middle School and High School (p. 44)                                     |
| 10:00–11:30 AM   | 5–12 | B408, GWCC           | A Close Encounter with the Red Planet (p. 47)                                                                                                     |
| 10:00–11:30 AM   | 6–12 | B308, GWCC           | Biology and Geology: Co-Evolving Over Time (p. 45)                                                                                                |
| 10:00 AM–4:00 PM | 6–8  | Augusta B/C, Westin  | SC-7: The World Ender: A STEAM PBL Unit (p. 49)                                                                                                   |
| 10:15–10:45 AM   | 6–8  | A313, GWCC           | Meet Me in the Middle Session: Patterns: Investigating Weather and Climate—Graph and Analyze Online, Easily and for Free (p. 49)                  |
| 10:15–10:45 AM   | 6–8  | A311, GWCC           | Meet Me in the Middle Session: GIS Learning: Your Next Superpower (p. 49)                                                                         |
| 11:00–11:30 AM   | 6–C  | A412a, GWCC          | After an Earthquake: Real-Time Earthquake Data as a Hook to Encourage Answer-Seeking about the Geologic and Societal Context of the Event (p. 51) |
| 11:00 AM–12 Noon | 7–12 | A305, GWCC           | Global Watershed Project: Water Chemistry and Restoration (p. 56)                                                                                 |

|                 |      |                                |                                                                                                                            |
|-----------------|------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| 11:00AM–12 Noon | 6–C  | C205, GWCC                     | Using Local and National Climate Data to Support Student Understanding of Climate Change (p. 58)                           |
| 11:00AM–12 Noon | K–C  | B103, GWCC                     | NESTA and NOAA Share: NOAA Planet Stewards—Content, Collaboration, and Action (p. 58)                                      |
| 11:00AM–12 Noon | 5–9  | C209, GWCC                     | Developing Science Practices: Constructing Explanations and Engaging in Argumentation (p. 58)                              |
| 12 Noon–1:30 PM | G    | B406, GWCC                     | Space Station Explorers: Explore the Partner Programs that Take Science Education to SPACE! (p. 64)                        |
| 12:30–1:00 PM   | 5–12 | A412a, GWCC                    | STEM on Station (p. 65)                                                                                                    |
| 12:30–1:00 PM   | C    | Int'l Blrm. D, Omni at CNN     | A STEM Minor for Elementary Teachers: Empowering! (p. 65)                                                                  |
| 12:30–1:30 PM   | K–5  | A410, GWCC                     | Creating Teachable Moments for Elementary Science Through Literature (p. 70)                                               |
| 12:30–1:30 PM   | 5–10 | C205, GWCC                     | Taking STEM Outdoors: Connecting STEM and Conservation Education (p. 68)                                                   |
| 12:30–1:30 PM   | 6–12 | A302, GWCC                     | PolarTREC and NASA's Operation IceBridge: Using Real Data in Your Classroom (p. 69)                                        |
| 12:30–1:30 PM   | K–11 | B103, GWCC                     | NESTA and NOAA Ocean, Climate, and Weather Share-a-Thon (p. 71)                                                            |
| 12:30–1:30 PM   | 8–C  | Birch, Omni at CNN             | Systems Modeling Everyone Can Do (p. 68)                                                                                   |
| 12:30–1:30 PM   | 8–C  | Walnut, Omni at CNN            | High School Science OER Course Project (p. 69)                                                                             |
| 12:30–1:30 PM   | 6–12 | A305, GWCC                     | Citizen Science and Authentic Research Through the Mapping of the Moon (p. 69)                                             |
| 12:30–1:30 PM   | 5–12 | Dogwood A, Omni at CNN         | Tools of the Trade: 3-D Science in the Everyday Classroom (p. 72)                                                          |
| 12:30–1:30 PM   | 3–12 | B301, GWCC                     | Demystifying Phenomenon: Earthquake-Proof Towers and Engineering Design (p. 73)                                            |
| 1:00–1:30 PM    | K–12 | A412a, GWCC                    | Engaging and Immersing All Students in an Ocean of STEM (p. 76)                                                            |
| 1:00–2:30 PM    | K–5  | B409, GWCC                     | Use Science, Coding, and Robotics in the Elementary Classroom to Solve Real-World Problems (p. 77)                         |
| 2:00–3:00 PM    | G    | Pine, Omni at CNN              | Field-Based Professional Development: Fostering Community Engagement and Personal Growth for Teachers and Students (p. 83) |
| 2:00–3:00 PM    | 9–12 | B401, GWCC                     | Rethinking Assessment: Strategies for the NGSS Classroom (p. 84)                                                           |
| 2:00–3:00 PM    | G    | Sidney Marcus Auditorium, GWCC | AGU-NESTA Sponsored Lecture: Chasing Coral Bleaching: A Present and Growing Ecological Disaster (p. 79)                    |
| 2:00–3:00 PM    | 6–8  | A305, GWCC                     | What the Heck Is Global Circulation?! Using Phenomenon-Driven Instruction to Engage Students in 3-D Learning (p. 83)       |
| 2:00–3:00 PM    | 5–9  | C207, GWCC                     | Scientists Becoming RACERS: Articulating Complex Discoveries (p. 82)                                                       |
| 2:00–3:00 PM    | K–5  | A405, GWCC                     | See It All! Explore Science and Engineering Through a Literacy Lens (p. 84)                                                |
| 2:00–3:00 PM    | 3–C  | C205, GWCC                     | Using NASA Data to Enhance Earth Science and Make STEM Connections (p. 85)                                                 |
| 2:00–3:00 PM    | P–C  | B103, GWCC                     | NESTA and NOAA Share: Game Design and Game Jams for the Science Classroom (p. 84)                                          |
| 2:00–3:00 PM    | 5–9  | C212, GWCC                     | Geomagnetism—From the Solar Wind to Power System Impacts (p. 85)                                                           |
| 2:00–3:30 PM    | 9–C  | B306, GWCC                     | Changing Perceptions on Climate Change Through Citizen Science and Phenology (p. 90)                                       |
| 2:00–3:30 PM    | 5–C  | B217, GWCC                     | Sustainable and Safe Food and Water for Engaging STEM Students (p. 89)                                                     |
| 2:00–3:30 PM    | 4–C  | B218, GWCC                     | Stream Ecology: Slimy Leaves for Healthy Streams (p. 89)                                                                   |
| 2:00–3:30 PM    | 4–C  | B403, GWCC                     | Keep Your Head Above Water with Magnetic Water Molecule Models (p. 91)                                                     |
| 3:30–4:00 PM    | P–5  | A401, GWCC                     | A River Story: Expanding Science Access to Urban Second Graders and Their Teachers (p. 94)                                 |
| 3:30–4:30 PM    | 9–12 | C212, GWCC                     | Exploring Visible and Infrared Light and Energy in a 3-D Learning Setting (p. 100)                                         |
| 3:30–4:30 PM    | 3–6  | A313, GWCC                     | Understanding the Local Watershed through Investigations and Literature (p. 98)                                            |
| 3:30–4:30 PM    | 4–8  | A407, GWCC                     | Trips and Treks: Teaching Endangered Species Through Literature (p. 96)                                                    |
| 3:30–4:30 PM    | 9–12 | A302, GWCC                     | Analysis of Supernova Remnants Using X-Ray Spectroscopy with NASA Data and STEM Tools (p. 98)                              |
| 3:30–4:30 PM    | 4–9  | A315, GWCC                     | Moon Madness (p. 98)                                                                                                       |
| 3:30–4:30 PM    | 7–11 | A305, GWCC                     | Cloudy with a Chance of...SCIENCE! (p. 98)                                                                                 |



## Schedule at a Glance Earth and Space Science

|              |      |                       |                                                                                                              |
|--------------|------|-----------------------|--------------------------------------------------------------------------------------------------------------|
| 3:30–4:30 PM | G    | A412a, GWCC           | Bring the Ocean into Your Classroom with National Marine Sanctuaries (p. 96)                                 |
| 3:30–4:30 PM | K–5  | B401, GWCC            | Phenomenal Mysteries and Probes in Science (p. 99)                                                           |
| 3:30–4:30 PM | 7–12 | C213, GWCC            | Integrating Literacy with Science Content to Develop Viable Solutions to Existing Worldwide Problems (p. 96) |
| 3:30–4:30 PM | 6–8  | A311, GWCC            | Scaffolding the Crosscutting Concepts: Tools for 3-D Thinking in Middle School (p. 96)                       |
| 3:30–4:30 PM | K–12 | B103, GWCC            | NESTA and PolarTREC Earth System Science Share-a-Thon (p. 99)                                                |
| 4:00–5:30 PM | 7–C  | B208, GWCC            | Renewable Energy with KidWind and Vernier (p. 103)                                                           |
| 4:00–5:30 PM | 6–8  | B302, GWCC            | Evolutionary Evidence in the Fossil Record (p. 104)                                                          |
| 4:00–5:30 PM | 6–12 | B204, GWCC            | Clean Up Your Mess! (p. 103)                                                                                 |
| 4:00–5:30 PM | 6–8  | B404, GWCC            | National Geographic's Geo-Inquiry Process in Action! (p. 105)                                                |
| 4:00–5:30 PM | 4–12 | B218, GWCC            | JASON Learning Inspiring All Learners, Building STEM Communities (p. 104)                                    |
| 5:00–5:30 PM | 6–C  | A303, GWCC            | Engaging Geysers: Modeling Geyser Eruptions in the Earth Science Classroom (p. 106)                          |
| 5:00–5:30 PM | 6–C  | Magnolia, Omni at CNN | Applying STEM Models of Instruction: Synectics Teaching (p. 107)                                             |
| 5:00–6:00 PM | 6–8  | A302, GWCC            | Blast Off with Astronomy Club! (p. 109)                                                                      |
| 5:00–6:00 PM | 4–C  | C302, GWCC            | Using Authentic Ocean Data to Meet the NGSS (p. 111)                                                         |
| 5:00–6:00 PM | 6–12 | A305, GWCC            | Using NGSS Science and Engineering Practices to Study Climate Change (p. 109)                                |
| 5:00–6:00 PM | 5–C  | B103, GWCC            | NESTA and PRI: Activities from the Teacher-Friendly Guide to Climate Change (p. 110)                         |
| 5:30–6:00 PM | 5–12 | A303, GWCC            | The National Parks Meet NGSS (p. 112)                                                                        |

## Engineering, Technology, and the Application of Science: Friday

|               |      |                            |                                                                                                                              |
|---------------|------|----------------------------|------------------------------------------------------------------------------------------------------------------------------|
| 8:00–9:00 AM  | 6–8  | C206, GWCC                 | 3-D Learning Through NASA Orion Missions (p. 18)                                                                             |
| 8:00–9:00 AM  | K–C  | A303, GWCC                 | Let's Eradicate Mosquito-Borne Diseases! Join a Global Citizen Science Effort to Achieve This! (p. 16)                       |
| 8:00–9:00 AM  | 7–12 | Dogwood A, Omni at CNN     | Global Collaboration in Engineering: Examples of RC Cars and Drones (p. 22)                                                  |
| 8:00–9:00 AM  | 4–12 | Int'l Blrm. D, Omni at CNN | Full STEAM Ahead... Engineering Activities to Engage All Students (p. 23)                                                    |
| 8:00–9:00 AM  | 6–8  | A313, GWCC                 | Using Models to Move Past the Scientific Processes of Test and Measurement into the Engineering Stage of Development (p. 21) |
| 8:00–9:00 AM  | 7–12 | B316, GWCC                 | Made Easy: How to Untangle Electric Circuits (p. 24)                                                                         |
| 8:00–9:00 AM  | 3–8  | B216, GWCC                 | littleBits in Grades 3–8 STEM Classrooms (p. 24)                                                                             |
| 8:00–9:30 AM  | 7–C  | B207, GWCC                 | Water Quality with Vernier (p. 25)                                                                                           |
| 8:00–9:30 AM  | K–1  | B404, GWCC                 | Patterns in the Sky: Phenomena and 3-D Instruction for Grades K–1 (p. 28)                                                    |
| 8:00–9:30 AM  | P–5  | B213, GWCC                 | Get Hands-On with STEM (p. 25)                                                                                               |
| 8:00–9:30 AM  | 5–12 | B409, GWCC                 | Integrating Robotics into Your Science Classroom (Grades 5+) (p. 28)                                                         |
| 8:00–9:30 AM  | 4–8  | B306, GWCC                 | STEM Design Challenge (p. 26)                                                                                                |
| 8:00–9:30 AM  | 6–11 | B303, GWCC                 | Wind Turbines: A STEM Approach to Engineering and Design (p. 26)                                                             |
| 8:00–9:30 AM  | 9–C  | B208, GWCC                 | Advanced Physics with Vernier (p. 25)                                                                                        |
| 8:00–9:30 AM  | 6–C  | B312, GWCC                 | Grow GMO Seeds in Your Classroom, Conduct Protein and DNA Analyses Using Lateral Flow Strips and PCR (p. 27)                 |
| 9:30–10:00 AM | 7–12 | C205, GWCC                 | Citizen Science Ecosystem Biodiversity in United States and Abroad (with Lemurs!) (p. 32)                                    |
| 9:30–10:30 AM | 6–8  | C210, GWCC                 | Supporting NGSS Equity-Oriented High-Leverage Teaching Practices in Middle Grades Engineering (p. 38)                        |
| 9:30–10:30 AM | 3–8  | A316, GWCC                 | STEM Competition: Two Grade 4 Classes and a Unit on Energy (p. 37)                                                           |
| 9:30–10:30 AM | G    | B402, GWCC                 | National Marine Sanctuaries: Bringing Ocean Technology into Your Classroom (p. 34)                                           |
| 9:30–10:30 AM | K–12 | A303, GWCC                 | Protecting the Outer Space Environment (p. 33)                                                                               |
| 9:30–10:30 AM | 6–12 | A410, GWCC                 | Cheap STEM Lessons for the Classroom (p. 37)                                                                                 |
| 9:30–10:30 AM | 7–12 | B316, GWCC                 | Crash Barrier: How to Design a STEM Engineering Challenge (p. 40)                                                            |

## Schedule at a Glance Engineering, Technology, and the Application of Science

|                  |        |                            |                                                                                                                                              |
|------------------|--------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 10:00–10:30 AM   | 9–12   | A404, GWCC                 | Starting with Engineering and Group Work (p. 41)                                                                                             |
| 10:00–11:30 AM   | P–8    | B409, GWCC                 | Gears, Wheels, Axles, Levers, and Pulleys: How Do They Lay the Foundation for Robotics? (p. 47)                                              |
| 10:00–11:30 AM   | 2–5    | B404, GWCC                 | Establishing an Orangutan Reserve: Phenomena and 3-D Instruction for Grades 2–5 (p. 46)                                                      |
| 10:00–11:30 AM   | 9–C    | B207, GWCC                 | Chemistry with Vernier (p. 43)                                                                                                               |
| 10:00–11:30 AM   | 7–C    | B208, GWCC                 | Explore Motion with Vernier Video Physics for iOS (p. 43)                                                                                    |
| 10:00 AM–12 Noon | P–C    | B101, GWCC                 | Community Connections Featured Presentation and Panel: Spare Parts: Reinventing Engineering Education for the 21st Century (p. 48)           |
| 10:00 AM–4:00 PM | 6–8    | Augusta B/C, Westin        | SC-7: The World Ender: A STEAM PBL Unit (p. 49)                                                                                              |
| 10:15–10:45 AM   | 5–9    | A312, GWCC                 | Meet Me in the Middle Session: Everyday Engineering (p. 49)                                                                                  |
| 11:00–11:30 AM   | P–5, C | Juniper, Omni at CNN       | Engineering in the Learning Cycle: Using the 5E Model to Teach Science-Focused STEM in Elementary (p. 52)                                    |
| 11:00 AM–12 Noon | 3–5    | A405, GWCC                 | Mission to Mars STEAM Camp (p. 56)                                                                                                           |
| 11:00 AM–12 Noon | 1–3    | A402, GWCC                 | Contraptions and Confidence: Transforming Science Learning with Engineering Design (p. 56)                                                   |
| 11:00 AM–12 Noon | 5–12   | B402, GWCC                 | Developing a Culturally Relevant Engineering Curriculum (p. 53)                                                                              |
| 11:00 AM–12 Noon | 6–8    | C212, GWCC                 | Engineering Prosthetic Hands: Integrating Anatomy into the Middle School Classroom (p. 59)                                                   |
| 11:00 AM–12 Noon | 6–8    | C211, GWCC                 | DiscoverE's Future City Program: A Project-Based STEM Experience (p. 58)                                                                     |
| 11:30 AM–12 Noon | K–12   | Juniper, Omni at CNN       | Guidelines for Transforming the Science Classroom into the STEM Classroom (p. 60)                                                            |
| 12 Noon–1:30 PM  | K–2    | B213, GWCC                 | STEM Bins®: Engineering Through Play (p. 62)                                                                                                 |
| 12 Noon–1:30 PM  | 9–12   | B208, GWCC                 | Inquiry Physics Experiments from Vernier: No Lab Setup Required! (p. 61)                                                                     |
| 12 Noon–1:30 PM  | 6–12   | B303, GWCC                 | Collisions and Restraints: Solving Problems Through Engineering (p. 63)                                                                      |
| 12 Noon–1:30 PM  | 7–C    | B207, GWCC                 | Biology with Vernier Using Chromebook (p. 61)                                                                                                |
| 12:30–1:00 PM    | 5–12   | A412a, GWCC                | STEM on Station (p. 65)                                                                                                                      |
| 12:30–1:00 PM    | C      | Int'l Blrm. D, Omni at CNN | A STEM Minor for Elementary Teachers: Empowering! (p. 65)                                                                                    |
| 12:30–1:30 PM    | K–5    | A410, GWCC                 | Creating Teachable Moments for Elementary Science Through Literature (p. 70)                                                                 |
| 12:30–1:30 PM    | P–5    | A408, GWCC                 | Using STEM-Related Picture Books to Encourage Students' Interest in STEM (p. 66)                                                             |
| 12:30–1:30 PM    | 5–8    | C302, GWCC                 | Ready-STEM-Go: Use Rubber Band-Powered Cars to Drive a Cross-Curricular Unit (p. 72)                                                         |
| 12:30–1:30 PM    | 3–9    | B309, GWCC                 | Dumbledore's Transfiguration Class: Science and Magic from Hogwarts Academy (p. 66)                                                          |
| 12:30–1:30 PM    | K–5    | A401, GWCC                 | STEAM in Action (p. 66)                                                                                                                      |
| 12:30–1:30 PM    | K–12   | B402, GWCC                 | The InVenture Challenge: Developing Future Innovators Through Invention and Entrepreneurship Experiences (p. 66)                             |
| 12:30–1:30 PM    | 3–12   | B301, GWCC                 | Demystifying Phenomenon: Earthquake-Proof Towers and Engineering Design (p. 73)                                                              |
| 12:30–1:30 PM    | 6–12   | A302, GWCC                 | PolarTREC and NASA's Operation IceBridge: Using Real Data in Your Classroom (p. 69)                                                          |
| 12:30–1:30 PM    | 8–C    | Birch, Omni at CNN         | Systems Modeling Everyone Can Do (p. 68)                                                                                                     |
| 12:30–1:30 PM    | 6–9    | C211, GWCC                 | Bioengineering Challenges and Middle School Life Science (p. 72)                                                                             |
| 12:30–1:30 PM    | 5–12   | Dogwood A, Omni at CNN     | Tools of the Trade: 3-D Science in the Everyday Classroom (p. 72)                                                                            |
| 12:30–1:30 PM    | 5–10   | C205, GWCC                 | Taking STEM Outdoors: Connecting STEM and Conservation Education (p. 68)                                                                     |
| 12:30–1:30 PM    | K–2    | A405, GWCC                 | Made for the Shade: A SUN-Sational Engineering Design Unit (p. 70)                                                                           |
| 12:30–1:30 PM    | 9–C    | Grand Blrm. B, Omni at CNN | Accessibility for the Blind and Vision Impaired: Engaging Students in the Engineering Design Process through a Human-Centered Module (p. 72) |
| 1:00–1:30 PM     | 9–C    | Juniper, Omni at CNN       | Engineering Technology: The Other Engineering Degree for a STEM World (p. 76)                                                                |
| 1:00–1:30 PM     | K–12   | A412a, GWCC                | Engaging and Immersing All Students in an Ocean of STEM (p. 76)                                                                              |
| 1:00–1:30 PM     | P–8    | A303, GWCC                 | The What, the Why, and the How of Using iPads for Incorporating Literacy into the Science Classroom (p. 76)                                  |

## Schedule at a Glance Engineering, Technology, and the Application of Science

|              |      |                            |                                                                                                                                                                       |
|--------------|------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1:00–1:30 PM | 6–8  | A312, GWCC                 | Meet Me in the Middle Session: Engineering in Middle School Chemistry (p. 77)                                                                                         |
| 1:00–2:30 PM | K–5  | B409, GWCC                 | Use Science, Coding, and Robotics in the Elementary Classroom to Solve Real-World Problems (p. 77)                                                                    |
| 2:00–2:30 PM | P–12 | Birch, Omni at CNN         | Makerspaces: Why, What, How (p. 78)                                                                                                                                   |
| 2:00–3:00 PM | P–1  | B211, GWCC                 | STEM Sprouts: STEM for Early Childhood (p. 80)                                                                                                                        |
| 2:00–3:00 PM | 7–9  | Dogwood A, GWCC            | Engineering to Nurture Biodiversity in a Vacant Lot: 3-D Learning in Urban Schools (p. 86)                                                                            |
| 2:00–3:00 PM | 6–8  | C209, GWCC                 | Building STEM Knowledge, Practices, and Skills Through Computer Electronic Engineering (p. 85)                                                                        |
| 2:00–3:00 PM | 3–8  | B212, GWCC                 | Engineering Design Notebooks in the Classroom (p. 84)                                                                                                                 |
| 2:00–3:00 PM | 3–8  | B301, GWCC                 | DIVE-in Engineering: New Ideas for the Maker Movement (p. 87)                                                                                                         |
| 2:00–3:30 PM | 3–C  | B207, GWCC                 | AP Chemistry with Vernier (p. 88)                                                                                                                                     |
| 2:00–3:30 PM | 9–11 | B305, GWCC                 | Chemical Formula and Amino Acids (p. 89)                                                                                                                              |
| 2:00–3:30 PM | 6–12 | B213, GWCC                 | When Zombies Attack! (p. 88)                                                                                                                                          |
| 2:00–3:30 PM | 4–12 | B406, GWCC                 | Make Science Relevant and Engaging Featuring a Mobile Data Logger (p. 92)                                                                                             |
| 2:00–3:30 PM | 4–C  | B403, GWCC                 | Keep Your Head Above Water with Magnetic Water Molecule Models (p. 91)                                                                                                |
| 2:00–3:30 PM | 9–12 | B208, GWCC                 | Physics with Vernier (p. 88)                                                                                                                                          |
| 2:00–3:30 PM | 6–8  | B209, GWCC                 | Engineering Design in the NGSS (p. 88)                                                                                                                                |
| 3:00–4:30 PM | 4–8  | B409, GWCC                 | Explore Renewable Energy with Hands-On Activities (p. 93)                                                                                                             |
| 3:30–4:00 PM | P–5  | A401, GWCC                 | A River Story: Expanding Science Access to Urban Second Graders and Their Teachers (p. 94)                                                                            |
| 3:30–4:00 PM | K–3  | A408, GWCC                 | Laser Cutters + 3D Printers + Vinyl Cutters = Bolstered K–3 Math Curriculum (p. 94)                                                                                   |
| 3:30–4:30 PM | 1–12 | A312, GWCC                 | ASTC-Sponsored Session: Designing the World: Engineering Design through a Historical Lens (p. 98)                                                                     |
| 3:30–4:30 PM | K–12 | B102, GWCC                 | NGSS@NSTA Forum Session: How Can Light Help Me See and Communicate with Others? A Storyline Designed to Support 3-D Learning in an Early Elementary Classroom (p. 99) |
| 3:30–4:30 PM | 6–C  | C206, GWCC                 | Engineering Design Journals: Trials and Tribulations (p. 99)                                                                                                          |
| 3:30–4:30 PM | 5–12 | Grand Blrm. B, Omni at CNN | Drone/UAV Lessons for Science and STEM Education (p. 100)                                                                                                             |
| 3:30–4:30 PM | 7–12 | B316, GWCC                 | STEM Activity: Better Bridge Building! (p. 101)                                                                                                                       |
| 3:30–4:30 PM | K–8  | A316, GWCC                 | STEMgenuity (p. 98)                                                                                                                                                   |
| 3:30–4:30 PM | 5–9  | C210, GWCC                 | Engage, Explore, Energize: An Adventure on Owl Island (p. 100)                                                                                                        |
| 3:30–4:30 PM | K    | B402, GWCC                 | Sliders, Blocks, Fences, and Mazes: Kindergarten Physics and Engineering (p. 99)                                                                                      |
| 3:30–4:30 PM | 9–12 | C204, GWCC                 | Controversy in Three Dimensions: Should the HPV Vaccine Be Mandatory? (p. 96)                                                                                         |
| 3:30–4:30 PM | K–6  | A403, GWCC                 | Transforming the “Oldies”: Make Phenomena and Modeling Inspire Your Next Generation Learners (p. 98)                                                                  |
| 3:30–4:30 PM | 4–10 | B405, GWCC                 | NSTA Press® Session: <i>Everyday Engineering</i> (p. 99)                                                                                                              |
| 4:00–4:30 PM | K–3  | A408, GWCC                 | Using 3D Printers in K–3 to Boost Student Engagement and Learning (p. 102)                                                                                            |
| 4:00–5:30 PM | 6–12 | B303, GWCC                 | Makerspace Strategies and Solutions for the Secondary Level (p. 104)                                                                                                  |
| 4:00–5:30 PM | 7–C  | B207, GWCC                 | Biology with Vernier (p. 103)                                                                                                                                         |
| 4:00–5:30 PM | 7–C  | B208, GWCC                 | Renewable Energy with KidWind and Vernier (p. 103)                                                                                                                    |
| 4:00–5:30 PM | 6–12 | B213, GWCC                 | Are You Moody? (p. 103)                                                                                                                                               |
| 4:00–5:30 PM | G    | B313, GWCC                 | STEAM Meets IoT: Code Your Own Autonomous Vehicle with SAM Labs (p. 105)                                                                                              |
| 4:00–5:30 PM | 6–8  | B302, GWCC                 | Evolutionary Evidence in the Fossil Record (p. 104)                                                                                                                   |
| 4:00–5:30 PM | 4–12 | B218, GWCC                 | JASON Learning Inspiring All Learners, Building STEM Communities (p. 104)                                                                                             |
| 5:00–5:30 PM | 6–C  | A303, GWCC                 | Engaging Geysers: Modeling Geyser Eruptions in the Earth Science Classroom (p. 106)                                                                                   |
| 5:00–5:30 PM | 6–C  | Magnolia, Omni at CNN      | Applying STEM Models of Instruction: Synectics Teaching (p. 107)                                                                                                      |
| 5:00–5:30 PM | 9–12 | C206, GWCC                 | Broadening Borders to Build Better Schools (p. 106)                                                                                                                   |
| 5:00–6:00 PM | 6–8  | A302, GWCC                 | Blast Off with Astronomy Club! (p. 109)                                                                                                                               |
| 5:00–6:00 PM | 6–12 | A405, GWCC                 | Digital Badging: Incorporating Literacy, Science, and Engineering as a Cohesive Model (p. 109)                                                                        |
| 5:00–6:00 PM | 4–8  | A316, GWCC                 | Lightweight and Strong: Building NASA’s Space Launch System (p. 109)                                                                                                  |

## Schedule at a Glance Engineering, Technology, and the Application of Science

|              |      |            |                                                                               |
|--------------|------|------------|-------------------------------------------------------------------------------|
| 5:00–6:00 PM | 6–12 | A305, GWCC | Using NGSS Science and Engineering Practices to Study Climate Change (p. 109) |
| 5:30–6:00 PM | 9–12 | C301, GWCC | Integrating the Engineering Design Process with Forces and Motion (p. 112)    |

### Life Science: Friday

|                |      |                                 |                                                                                                                                                                           |
|----------------|------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7:15– 11:50 AM | 6–12 | Clarkston High School, Off-site | SC-4: Science for Everyone: Engaging Diverse Learners Using SIOP Strategies, Visual Literacy, Scaffolding, and Culturally Relevant Pedagogy (p. 15)                       |
| 8:00–8:30 AM   | 5–C  | C202, GWCC                      | Tower Garden Project (p. 15)                                                                                                                                              |
| 8:00–9:00 AM   | 6–12 | A402, GWCC                      | Using Models to Support STEM Learning in Grades 6–12: Examples and Insights from NSF's DRK-12 Program (p. 17)                                                             |
| 8:00–9:00 AM   | 3    | Maple C, S. Tower, Omni at CNN  | NARST-Sponsored Session: Using Agriculture as a Context for Teaching Genetics in Elementary Classrooms: Insights from UniCORN (Understanding Inheritance in CORN) (p. 19) |
| 8:00–9:00 AM   | 5–12 | A305, GWCC                      | <i>The Little Things That Run the World</i> : Soil Ecology in the Classroom (p. 20)                                                                                       |
| 8:00–9:00 AM   | 9–12 | C204, GWCC                      | Teaching Your Students About Managing a Fishery (Resource) (p. 18)                                                                                                        |
| 8:00–9:00 AM   | 6–9  | C211, GWCC                      | A Journal of Student Research: Giving Purpose to Writing in Science (p. 22)                                                                                               |
| 8:00–9:00 AM   | K–C  | A303, GWCC                      | Let's Eradicate Mosquito-Borne Diseases! Join a Global Citizen Science Effort to Achieve This! (p. 16)                                                                    |
| 8:00–9:00 AM   | 6–8  | C206, GWCC                      | 3-D Learning Through NASA Orion Missions (p. 18)                                                                                                                          |
| 8:00–9:00 AM   | 6–12 | A410, GWCC                      | How to Support Biology Students in Constructing Explanations About Carbon-Transforming Processes (p. 21)                                                                  |
| 8:00–9:30 AM   | K–1  | B404, GWCC                      | Patterns in the Sky: Phenomena and 3-D Instruction for Grades K–1 (p. 28)                                                                                                 |
| 8:00–9:30 AM   | P–5  | B213, GWCC                      | Get Hands-On with STEM (p. 25)                                                                                                                                            |
| 8:00–9:30 AM   | 6–12 | B202, GWCC                      | Comparative Mammalian Organ Dissection with Carolina's Perfect Solution® Specimens (p. 24)                                                                                |
| 8:00–9:30 AM   | 6–12 | B308, GWCC                      | Scientists at Work: Bringing Science to Life with HHMI BioInteractive (p. 27)                                                                                             |
| 8:00–9:30 AM   | 6–8  | B217, GWCC                      | Different Isn't Bad: Using Arthropods to Teach About Science, Society, and Being a Teen (p. 26)                                                                           |
| 8:00–9:30 AM   | 7–C  | B207, GWCC                      | Water Quality with Vernier (p. 25)                                                                                                                                        |
| 8:00–9:30 AM   | 9–11 | B305, GWCC                      | Photosynthesis and Respiration Shuffle (p. 26)                                                                                                                            |
| 8:00–9:30 AM   | 9–C  | B310, GWCC                      | Who's the Panda Daddy? The Bear Facts (p. 27)                                                                                                                             |
| 8:00–9:30 AM   | 9–C  | B311, GWCC                      | Algae Blooms: Agriculture, Ecology, and Economy (p. 27)                                                                                                                   |
| 8:00–9:30 AM   | 6–8  | B215, GWCC                      | Toward High School Biology: Introducing a New Middle School Curriculum Unit (p. 25)                                                                                       |
| 8:00–9:30 AM   | 6–C  | B312, GWCC                      | Grow GMO Seeds in Your Classroom, Conduct Protein and DNA Analyses Using Lateral Flow Strips and PCR (p. 27)                                                              |
| 8:00–11:00 AM  | K–12 | Chastain I/J, Westin            | SC-6: Citizen Science Projects That Transform Schoolyards into STEM Labs and Help K–12 Students Make Sense of Phenomena in Nature (p. 29)                                 |
| 8:30–9:00 AM   | 5–C  | Walnut, Omni at CNN             | PolarTREC in Antarctica: The Long-Term Benefits of Teacher/Researcher Collaboration (p. 30)                                                                               |
| 8:30–9:00 AM   | 4–12 | B212, GWCC                      | Flowcharts and Technical Writing: Using Anatomy Diagrams (p. 30)                                                                                                          |
| 8:30–9:00 AM   | 5–C  | Birch, Omni at CNN              | NGSS 3-D Learning: Using Student-Developed Games to Explore Ecosystem Relationships and Enhance Learning (p. 30)                                                          |
| 8:30–9:00 AM   | 5–C  | C202, GWCC                      | The Science of Plants in Fiction, Poetry, and the Movies (p. 30)                                                                                                          |
| 8:30–9:00 AM   | 5–C  | Walnut, Omni at CNN             | PolarTREC in Antarctica: The Long-Term Benefits of Teacher/Researcher Collaboration (p. 30)                                                                               |
| 9:30–10:00 AM  | 4–12 | C202, GWCC                      | Project Hero: Catalyzing Empathy for Species in Trouble (p. 32)                                                                                                           |
| 9:30–10:00 AM  | C    | Hickory, Omni at CNN            | SCST-Sponsored Session: Using a Flexible Approach to Integrating Authentic Research Experiences into a Variety of Introductory Biology Courses (p. 32)                    |
| 9:30–10:00 AM  | 9–12 | C212, GWCC                      | BILLs and ChILLs: Using Interactive Learning Logs in Biology and Chemistry (p. 32)                                                                                        |
| 9:30–10:00 AM  | 7–12 | C205, GWCC                      | Citizen Science Ecosystem Biodiversity in United States and Abroad (with Lemurs!) (p. 32)                                                                                 |

## Schedule at a Glance Life Science

|                  |       |                            |                                                                                                                                                                                     |
|------------------|-------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9:30–10:30 AM    | 6–8   | B315, GWCC                 | Hands-On: Strategies to Teach Adaptations (p. 40)                                                                                                                                   |
| 9:30–10:30 AM    | 5–C   | Dogwood A, Omni at CNN     | Combine Scientists, Data, Media, and Interactives in the Science Classroom to Immerse Students in the Science (p. 39)                                                               |
| 9:30–10:30 AM    | 6–C   | Grand Blrm. B, Omni at CNN | Inside an Outbreak Investigation with CDC: Strategies for Teaching Public Health in the Classroom (p. 39)                                                                           |
| 9:30–10:30 AM    | G     | B402, GWCC                 | National Marine Sanctuaries: Bringing Ocean Technology into Your Classroom (p. 34)                                                                                                  |
| 9:30–10:30 AM    | 9–C   | C203, GWCC                 | Describing Data Using Central Tendencies, Graphs, and Statistics in AP and IB (p. 38)                                                                                               |
| 9:30–10:30 AM    | 9–C   | C204, GWCC                 | Using the PTC Gene to Create an Authentic to Study Mendelian Principles and Evolutionary Trends (p. 34)                                                                             |
| 9:30–10:30 AM    | 6–12  | A301, GWCC                 | Teaching Environmental Sustainability Using a Free Place-Based Watershed Model (p. 37)                                                                                              |
| 9:30–10:30 AM    | 9–C   | A401, GWCC                 | Project-Based Learning Marine Science (p. 33)                                                                                                                                       |
| 9:30–10:30 AM    | 6–12  | C209, GWCC                 | Revisiting Assessments with Scientific Discourse and Argumentation (p. 38)                                                                                                          |
| 9:30–10:30 AM    | K–12  | B102, GWCC                 | NGSS@NSTA Forum Session: What's the Matter with Addie, and What Should We Do with CRISPR? Next Generation Storylines That Connect Science to Student Interests and Concerns (p. 38) |
| 9:30–10:30 AM    | 6–12  | C201, GWCC                 | Students Understanding Caffeine and Sugar Toxicity from a Planarian's Perspective (p. 38)                                                                                           |
| 10:00–10:30 AM   | 6–12  | C205, GWCC                 | NGSS-Ready Project-Based Ecology (p. 41)                                                                                                                                            |
| 10:00–10:30 AM   | 1–12  | C202, GWCC                 | A Bird in the Hand (p. 41)                                                                                                                                                          |
| 10:00–11:30 AM   | 9–C   | B310, GWCC                 | Fascinate Your Students with Glowing Bacteria (p. 45)                                                                                                                               |
| 10:00–11:30 AM   | 6–12  | B303, GWCC                 | Go on a Cell Quest! Teaching Cell Structure Through Gaming (p. 45)                                                                                                                  |
| 10:00–11:30 AM   | 9–C   | B311, GWCC                 | Math and Modeling Together! Improving Students' Quantitative Skills in Biology (p. 46)                                                                                              |
| 10:00–11:30 AM   | 9–11  | B305, GWCC                 | Cell Differentiation and Gene Expression (p. 45)                                                                                                                                    |
| 10:00–11:30 AM   | P–C   | B407, GWCC                 | The Science of Vaccines: Your Questions Answered (p. 47)                                                                                                                            |
| 10:00–11:30 AM   | 6–12  | B214, GWCC                 | Using Molymod Model Kits to Enhance Instruction in Biology “the Building Blocks of Life” and Chemistry (p. 44)                                                                      |
| 10:00–11:30 AM   | 6–12  | B308, GWCC                 | Biology and Geology: Co-Evolving Over Time (p. 45)                                                                                                                                  |
| 10:00–11:30 AM   | 9–12  | B202, GWCC                 | Comparative Vertebrate Anatomy with Carolina's Perfect Solution® Specimens (p. 42)                                                                                                  |
| 10:00–11:30 AM   | 10–12 | B406, GWCC                 | AP Biology: BIOZONE Showcases the New 2017 Editions (p. 46)                                                                                                                         |
| 10:00–11:30 AM   | K–12  | B204, GWCC                 | Hands-On Activities to Model Sampling, Habitat Degradation, and Animal Choice (p. 43)                                                                                               |
| 10:00–11:30 AM   | K–5   | B201, GWCC                 | Plants, Bessbugs, and Squid: Build Understanding of Structure and Function (p. 42)                                                                                                  |
| 10:00–11:30 AM   | 9–12  | B213, GWCC                 | AP Biology Unwrapped: Discover the Keys to AP Exam Success (p. 44)                                                                                                                  |
| 10:15–10:45 AM   | 6–8   | A311, GWCC                 | Meet Me in the Middle Session: GIS Learning: Your Next Superpower (p. 49)                                                                                                           |
| 11:00 AM–12 Noon | 6–C   | Walnut, Omni at CNN        | Reflections on Teaching Baltimore City Science (p. 55)                                                                                                                              |
| 11:00 AM–12 Noon | 4–12  | Birch, Omni at CNN         | Hot Stuff: Empowering Student Action for Earth (p. 54)                                                                                                                              |
| 11:00 AM–12 Noon | K–12  | B102, GWCC                 | NGSS@NSTA Forum Session: A Model-Based Educational Resource for High School Biology (p. 56)                                                                                         |
| 11:00 AM–12 Noon | 9–12  | C201, GWCC                 | Big Science: Using Large Scale Genomics Projects in the Biology Classroom (p. 58)                                                                                                   |
| 11:00 AM–12 Noon | 6–8   | C212, GWCC                 | Engineering Prosthetic Hands: Integrating Anatomy into the Middle School Classroom (p. 59)                                                                                          |
| 11:00 AM–12 Noon | 6–C   | C203, GWCC                 | Unpacking Sources of Variation in Ecological Data (p. 58)                                                                                                                           |
| 11:00 AM–12 Noon | 9–12  | C202, GWCC                 | Developing an NGSS-Focused Biology Curriculum for Your District (p. 54)                                                                                                             |
| 12 Noon–1:30 PM  | 2–8   | B313, GWCC                 | 3-2-1 Blast Off! (p. 63)                                                                                                                                                            |
| 12 Noon–1:30 PM  | 9–11  | B305, GWCC                 | What Is a Species? (p. 63)                                                                                                                                                          |
| 12 Noon–1:30 PM  | 9–C   | B214, GWCC                 | Conservation Research Through Academic Partnerships: Discovering New Species with Students (p. 62)                                                                                  |



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|-----------------|--------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 12 Noon–1:30 PM | 9–12   | B314, GWCC                     | From Big Bird to Bird Brains: Modeling Structure and Function in Biology with Help from Our Feathered Friends (p. 63)                             |
| 12 Noon–1:30 PM | 6–12   | B204, GWCC                     | They Come in Pairs: Addressing Student Misconceptions About Chromosomes (p. 61)                                                                   |
| 12 Noon–1:30 PM | 9–C    | B306, GWCC                     | Application of Presumptive Tests for Blood to Physical Evidence (p. 63)                                                                           |
| 12 Noon–1:30 PM | 9–C    | B308, GWCC                     | Alzheimer's to Zoonosis: Using Disease to Teach Data Analysis (p. 63)                                                                             |
| 12 Noon–1:30 PM | 9–C    | B403, GWCC                     | Take a Walk through the Molecular World with Watercolor Landscapes (p. 64)                                                                        |
| 12 Noon–1:30 PM | 7–C    | B207, GWCC                     | Biology with Vernier Using Chromebook (p. 61)                                                                                                     |
| 12:30–1:00 PM   | 4–12   | Juniper, Omni at CNN           | Two Growth Mind-Set Activities to Help Motivate All Students and Teach Nature of Science (p. 65)                                                  |
| 12:30–1:00 PM   | C      | Int'l Blrm. D, Omni at CNN     | A STEM Minor for Elementary Teachers: Empowering! (p. 65)                                                                                         |
| 12:30–1:00 PM   | C      | Hickory, Omni at CNN           | SCST-Sponsored Session: Getting the Most Out of Peer-Led Team Learning (PLTL) Recitation Programs: Training, Organization, and Management (p. 65) |
| 12:30–1:30 PM   | 1–5    | A316, GWCC                     | Trade Books and 3-D for Developing a Seeds Unit (p. 70)                                                                                           |
| 12:30–1:30 PM   | K–5    | A410, GWCC                     | Creating Teachable Moments for Elementary Science Through Literature (p. 70)                                                                      |
| 12:30–1:30 PM   | 6–12   | C202, GWCC                     | Solving Mysteries and Saving Lives: How Scientific Inquiry and Creativity Drive Scientific Discovery and Innovation (p. 66)                       |
| 12:30–1:30 PM   | 8–C    | Birch, Omni at CNN             | Systems Modeling Everyone Can Do (p. 68)                                                                                                          |
| 12:30–1:30 PM   | 5–10   | C205, GWCC                     | Taking STEM Outdoors: Connecting STEM and Conservation Education (p. 68)                                                                          |
| 12:30–1:30 PM   | 6–12   | C213, GWCC                     | Merging Three-Dimensional Assessments with Standards-Based Grading (p. 68)                                                                        |
| 12:30–1:30 PM   | K–8    | A407, GWCC                     | Science on the Go: Using Museum Resources to Support Place-Based Learning (p. 66)                                                                 |
| 12:30–1:30 PM   | 2–8,C  | B405, GWCC                     | NSTA Press® Session: <i>From Flower to Fruit</i> (p. 71)                                                                                          |
| 12:30–1:30 PM   | 6–12   | C203, GWCC                     | Teach Evolution with the World's Most Extravagant Birds (p. 71)                                                                                   |
| 12:30–1:30 PM   | 5–12   | Dogwood A, Omni at CNN         | Tools of the Trade: 3-D Science in the Everyday Classroom (p. 72)                                                                                 |
| 12:30–1:30 PM   | 6–9    | C211, GWCC                     | Bioengineering Challenges and Middle School Life Science (p. 72)                                                                                  |
| 12:30–1:30 PM   | K–12   | B102, GWCC                     | NGSS@NSTA Forum Session: Disruptions in Ecosystems: An NGSS-Designed Middle School Unit and PD Model (p. 70)                                      |
| 1:00–1:30 PM    | K–12   | A412a, GWCC                    | Engaging and Immersing All Students in an Ocean of STEM (p. 76)                                                                                   |
| 1:00–1:30 PM    | 5–10,C | Int'l Blrm. D, Omni at CNN     | Integrating Math with Life Science: Four MS/HS Hands-On STEM Activities (p. 76)                                                                   |
| 1:00–1:30 PM    | 7      | A314, GWCC                     | Meet Me in the Middle Session: Using Agriculture to Enhance STEM Education (p. 76)                                                                |
| 1:45–2:15 PM    | 5–8    | A314, GWCC                     | Meet Me in the Middle Session: Using STEAM and Literacy to Teach Ecology in an Urban Classroom (p. 77)                                            |
| 1:45–2:15 PM    | 6–9    | A313, GWCC                     | Meet Me in the Middle Session: Paper Pets: A Fun Way to Teach Genetics and Natural Selection (p. 77)                                              |
| 2:00–2:30 PM    | 9–12   | Maple C, S. Tower, Omni at CNN | NARST-Sponsored Session: Biology Alternative Conceptions and Your Students (p. 78)                                                                |
| 2:00–2:30 PM    | 7–12   | C204, GWCC                     | A Rising Tide Lifts All Boats: Easy-Teach Strategies to Raise Achievement for English Language Learners (p. 78)                                   |
| 2:00–3:00 PM    | K–8    | B402, GWCC                     | Engaging Your STEM Ecosystem: A Fishy Success Story (p. 80)                                                                                       |
| 2:00–3:00 PM    | 7–9    | Dogwood A, GWCC                | Engineering to Nurture Biodiversity in a Vacant Lot: 3-D Learning in Urban Schools (p. 86)                                                        |
| 2:00–3:00 PM    | G      | Sidney Marcus Auditorium, GWCC | AGU-NESTA Sponsored Lecture: Chasing Coral Bleaching: A Present and Growing Ecological Disaster (p. 79)                                           |
| 2:00–3:00 PM    | 9–12   | B315, GWCC                     | Use Better Models to Teach Protein Synthesis (p. 87)                                                                                              |
| 2:00–3:00 PM    | 6–12   | C211, GWCC                     | Death by Hydration: Developing a 3-D Storyline from Modified Old Lessons (p. 85)                                                                  |
| 2:00–3:00 PM    | 9–12   | B316, GWCC                     | Hands-On: Modeling Ocean Acidification (p. 87)                                                                                                    |
| 2:00–3:00 PM    | 9–12   | C201, GWCC                     | Bone Fracture Risk and Big Data (p. 85)                                                                                                           |

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|--------------|------|--------------------------------|--------------------------------------------------------------------------------------------------------------|
| 2:00–3:00 PM | 9–12 | C202, GWCC                     | Controversy in Three Dimensions: Should We Charge More for Sugary Drinks? (p. 82)                            |
| 2:00–3:00 PM | 9–C  | Juniper, Omni at CNN           | DNA Barcoding: Independent Research for All (p. 82)                                                          |
| 2:00–3:00 PM | 9–12 | B401, GWCC                     | Rethinking Assessment: Strategies for the NGSS Classroom (p. 84)                                             |
| 2:00–3:00 PM | K–5  | A405, GWCC                     | See It All! Explore Science and Engineering Through a Literacy Lens (p. 84)                                  |
| 2:00–3:30 PM | 5–C  | B217, GWCC                     | Sustainable and Safe Food and Water for Engaging STEM Students (p. 89)                                       |
| 2:00–3:30 PM | 6–12 | B213, GWCC                     | When Zombies Attack! (p. 88)                                                                                 |
| 2:00–3:30 PM | 4–C  | B218, GWCC                     | Stream Ecology: Slimy Leaves for Healthy Streams (p. 89)                                                     |
| 2:00–3:30 PM | 9–C  | B311, GWCC                     | Lab Skills: The Escape Room! (p. 90)                                                                         |
| 2:00–3:30 PM | K–12 | B204, GWCC                     | Hands-On Science with Classroom Critters (p. 88)                                                             |
| 2:00–3:30 PM | 9–12 | B308, GWCC                     | BioInteractive Scientists at Work Integrates NGSS Practices! (p. 90)                                         |
| 2:00–3:30 PM | 5–C  | B404, GWCC                     | Take the Leap into the Frog-Friendly Lab (p. 91)                                                             |
| 2:00–3:30 PM | 6–12 | B202, GWCC                     | Protein Necklace: Harnessing the Glow of Jellyfish (p. 87)                                                   |
| 2:00–3:30 PM | 9–C  | B306, GWCC                     | Changing Perceptions on Climate Change Through Citizen Science and Phenology (p. 90)                         |
| 2:00–3:30 PM | 6–12 | B303, GWCC                     | Are You Crazy About Genetics? (p. 89)                                                                        |
| 2:00–3:30 PM | 4–C  | B403, GWCC                     | Keep Your Head Above Water with Magnetic Water Molecule Models (p. 91)                                       |
| 2:30–3:00 PM | 9–12 | Maple C, S. Tower, Omni at CNN | NARST-Sponsored Session: Uncovering Secondary Students' Alternative Conceptions in Biology (p. 93)           |
| 3:30–4:00 PM | 6–C  | Maple C, S. Tower, Omni at CNN | ASTE-Sponsored Session: Using Web GIS and iPads for Socio-Environmental Science Investigations (p. 94)       |
| 3:30–4:30 PM | 6–8  | A311, GWCC                     | Scaffolding the Crosscutting Concepts: Tools for 3-D Thinking in Middle School (p. 96)                       |
| 3:30–4:30 PM | 6–12 | B315, GWCC                     | Use Data to Slay Misconceptions about Photosynthesis and Respiration (p. 101)                                |
| 3:30–4:30 PM | 7–12 | C213, GWCC                     | Integrating Literacy with Science Content to Develop Viable Solutions to Existing Worldwide Problems (p. 96) |
| 3:30–4:30 PM | 6–12 | C205, GWCC                     | Using Authentic Biodiversity Data from Natural History Collections in Your Classroom (p. 99)                 |
| 3:30–4:30 PM | 5–C  | C202, GWCC                     | Engineering Through Aquaculture Technology for Women (p. 96)                                                 |
| 4:00–5:30 PM | 9–12 | B308, GWCC                     | Exploring Trophic Cascades with HHMI BioInteractive Resources (p. 105)                                       |
| 4:00–5:30 PM | 9–C  | B203, GWCC                     | Flipping AP Biology with FlinnPREP™ (p. 102)                                                                 |
| 4:00–5:30 PM | 5–12 | B304, GWCC                     | Georgia on My Brain: Hands-On Neuroscience Labs (p. 104)                                                     |
| 4:00–5:30 PM | 9–12 | B202, GWCC                     | Shark Dissection: A Jawsome Experience! (p. 102)                                                             |
| 4:00–5:30 PM | 7–C  | B207, GWCC                     | Biology with Vernier (p. 103)                                                                                |
| 4:00–5:30 PM | 8–C  | B403, GWCC                     | Get a Move On! Modeling Molecular Transport Across the Cell Membrane (p. 105)                                |
| 4:00–5:30 PM | 12–C | B408, GWCC                     | Explore Cells in 3D! (p. 106)                                                                                |
| 4:00–5:30 PM | 4–12 | B218, GWCC                     | JASON Learning Inspiring All Learners, Building STEM Communities (p. 104)                                    |
| 4:00–5:30 PM | 9–C  | B310, GWCC                     | Identify Patient Zero of a Zombie Apocalypse! (p. 105)                                                       |
| 4:00–5:30 PM | 9–C  | B311, GWCC                     | Lab Skills: The Escape Room! (p. 105)                                                                        |
| 5:00–5:30 PM | 8–12 | C202, GWCC                     | The Melanin Unit: An Example of an NGSS Storyline (p. 106)                                                   |
| 5:00–5:30 PM | 6–C  | Magnolia, Omni at CNN          | Applying STEM Models of Instruction: Synectics Teaching (p. 107)                                             |
| 5:00–6:00 PM | 9–12 | C201, GWCC                     | Memory, Attention, and Distraction (p. 110)                                                                  |
| 5:00–6:00 PM | 3    | A402, GWCC                     | Mammal Versus Reptile Skull: What Are the Differences? (p. 109)                                              |
| 5:00–6:00 PM | 4–C  | C302, GWCC                     | Using Authentic Ocean Data to Meet the NGSS (p. 111)                                                         |
| 5:00–6:00 PM | 6–12 | C211, GWCC                     | Animal Multimedia Inspires Learning and Engagement (p. 111)                                                  |
| 5:00–6:00 PM | 6–12 | A305, GWCC                     | Using NGSS Science and Engineering Practices to Study Climate Change (p. 109)                                |
| 5:00–6:00 PM | 5–C  | A301, GWCC                     | Model My Watershed: Using Real Data to Make Watershed Decisions (p. 107)                                     |
| 5:00–6:00 PM | 6–12 | B402, GWCC                     | Let's Get Vertical (p. 110)                                                                                  |
| 5:00–6:00 PM | 6–12 | C203, GWCC                     | Developing and Using Models in Life Science (p. 110)                                                         |
| 5:30–6:00 PM | 9–12 | C202, GWCC                     | An exCELLent Unit: Integrating STEM in Biology (p. 112)                                                      |
| 5:30–6:00 PM | 5–12 | A303, GWCC                     | The National Parks Meet NGSS (p. 112)                                                                        |

## Physical Science: Friday

|                  |      |                                 |                                                                                                                                                     |
|------------------|------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 7:15–11:50 AM    | 6–12 | Clarkston High School, Off-site | SC-4: Science for Everyone: Engaging Diverse Learners Using SIOP Strategies, Visual Literacy, Scaffolding, and Culturally Relevant Pedagogy (p. 15) |
| 8:00–8:30 AM     | 6–10 | A404, GWCC                      | Using Project-Based Learning to Stop Ocean Plastic Pollution (p. 15)                                                                                |
| 8:00–9:00 AM     | 6–8  | C209, GWCC                      | Analytical Thinking: Putting Your MAD Math Skill to Work in Science (p. 22)                                                                         |
| 8:00–9:00 AM     | K–12 | Int'l Blrm. F, Omni at CNN      | Using Phenomena to Initiate Student Science Performances (p. 19)                                                                                    |
| 8:00–9:00 AM     | 6–8  | C206, GWCC                      | 3-D Learning Through NASA Orion Missions (p. 18)                                                                                                    |
| 8:00–9:00 AM     | 6–12 | A402, GWCC                      | Using Models to Support STEM Learning in Grades 6–12: Examples and Insights from NSF's DRK-12 Program (p. 17)                                       |
| 8:00–9:00 AM     | 7–12 | B316, GWCC                      | Made Easy: How to Untangle Electric Circuits (p. 24)                                                                                                |
| 8:00–9:30 AM     | K–5  | B201, GWCC                      | Planning and Designing Investigations Using Balanced and Unbalanced Forces (p. 24)                                                                  |
| 8:00–9:30 AM     | 4–8  | B306, GWCC                      | STEM Design Challenge (p. 26)                                                                                                                       |
| 8:00–9:30 AM     | 2–9  | B313, GWCC                      | Cool! Can We Do That Again?! (p. 27)                                                                                                                |
| 8:00–9:30 AM     | 9–C  | B208, GWCC                      | Advanced Physics with Vernier (p. 25)                                                                                                               |
| 8:00–9:30 AM     | 9–11 | B305, GWCC                      | Photosynthesis and Respiration Shuffle (p. 26)                                                                                                      |
| 8:00–9:30 AM     | 5–C  | B203, GWCC                      | Fantastic Physical Science Demonstrations from Flinn Scientific (p. 24)                                                                             |
| 8:00–9:30 AM     | 9–12 | B218, GWCC                      | Inquiry in the Chemistry Classroom: A Game-Based Approach (p. 26)                                                                                   |
| 8:00–9:30 AM     | 1–12 | B403, GWCC                      | May the Force Be With You (p. 28)                                                                                                                   |
| 8:30–9:00 AM     | 5–C  | Walnut, Omni at CNN             | PolarTREC in Antarctica: The Long-Term Benefits of Teacher/Researcher Collaboration (p. 30)                                                         |
| 9:30–10:00 AM    | 9–12 | C301, GWCC                      | Planning and Carrying Out Investigations with GPB's Digital Series, <i>Chemistry Matters</i> (p. 32)                                                |
| 9:30–10:00 AM    | 9–12 | C212, GWCC                      | BILLS and ChILLS: Using Interactive Learning Logs in Biology and Chemistry (p. 32)                                                                  |
| 9:30–10:30 AM    | K–12 | C213, GWCC                      | Powerful Free Simulations for 3-D NGSS Teaching (p. 36)                                                                                             |
| 9:30–10:30 AM    | 6–8  | C210, GWCC                      | Supporting NGSS Equity-Oriented High-Leverage Teaching Practices in Middle Grades Engineering (p. 38)                                               |
| 9:30–10:30 AM    | 3–8  | A316, GWCC                      | STEM Competition: Two Grade 4 Classes and a Unit on Energy (p. 37)                                                                                  |
| 9:30–10:30 AM    | 6–9  | C302, GWCC                      | Moving Beyond Naming Forms: Teaching Energy to Middle School Students Through a System Transfer Approach (p. 38)                                    |
| 9:30–10:30 AM    | 7–12 | B316, GWCC                      | Crash Barrier: How to Design a STEM Engineering Challenge (p. 40)                                                                                   |
| 10:00–10:30 AM   | 9–12 | C212, GWCC                      | A Few of Our Favorite Chemistry Things (p. 42)                                                                                                      |
| 10:00–11:30 AM   | P–8  | B409, GWCC                      | Gears, Wheels, Axles, Levers, and Pulleys: How Do They Lay the Foundation for Robotics? (p. 47)                                                     |
| 10:00–11:30 AM   | 3–12 | B313, GWCC                      | Fantastical Chemistry Demos for All Classrooms (p. 46)                                                                                              |
| 10:00–11:30 AM   | 9–C  | B207, GWCC                      | Chemistry with Vernier (p. 43)                                                                                                                      |
| 10:00–11:30 AM   | 7–C  | B208, GWCC                      | Explore Motion with Vernier Video Physics for iOS (p. 43)                                                                                           |
| 10:00–11:30 AM   | 9–12 | B306, GWCC                      | The Chemistry of Glow Sticks (p. 45)                                                                                                                |
| 10:00–11:30 AM   | 9–12 | B314, GWCC                      | An NGSS Approach to Challenging Concepts in Chemistry (p. 46)                                                                                       |
| 10:00–11:30 AM   | 6–12 | B214, GWCC                      | Using Molymod Model Kits to Enhance Instruction in Biology “the Building Blocks of Life” and Chemistry (p. 44)                                      |
| 10:00–11:30 AM   | 6–8  | B403, GWCC                      | Seeing Is Believing: Physics Demonstrations to Energize Your Classroom (p. 46)                                                                      |
| 10:00–11:30 AM   | 9–C  | B215, GWCC                      | Spicing Up Classical Physics (p. 44)                                                                                                                |
| 10:00–4:00 PM    | 6–8  | Augusta B/C, Westin             | SC-7: The World Ender: A STEAM PBL Unit (p. 49)                                                                                                     |
| 11:00 AM–12 Noon | K–C  | Dogwood B, Omni at CNN          | Sounding Off: 3-D Learning in Enhanced 5E Lessons (p. 59)                                                                                           |
| 11:00 AM–12 Noon | 1–3  | A402, GWCC                      | Contraptions and Confidence: Transforming Science Learning with Engineering Design (p. 56)                                                          |
| 11:00 AM–12 Noon | 7–12 | B316, GWCC                      | Enlighten Your Optics, Color, and Light Unit (p. 60)                                                                                                |
| 11:00 AM–12 Noon | 9–12 | B315, GWCC                      | Stoichiometry: Tools and Strategies that Make It Easier to Teach (p. 60)                                                                            |
| 11:30 AM–12 Noon | 9–12 | C301, GWCC                      | Catch the Wave Using the 5E-IA Lesson Model (p. 60)                                                                                                 |
| 12 Noon–1:30 PM  | 6–12 | B202, GWCC                      | Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher (p. 61)                                                         |
| 12 Noon–1:30 PM  | 2–8  | B313, GWCC                      | 3-2-1 Blast Off! (p. 63)                                                                                                                            |

## Schedule at a Glance Physical Science

|                 |       |                        |                                                                                                                                                   |
|-----------------|-------|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 12 Noon–1:30 PM | 10–12 | B215, GWCC             | Visualizing Energy for Deeper Student Understanding (p. 62)                                                                                       |
| 12 Noon–1:30 PM | 7–C   | B203, GWCC             | Dynamic Demonstrations from Flinn Scientific (p. 61)                                                                                              |
| 12 Noon–1:30 PM | 9–C   | B403, GWCC             | Take a Walk through the Molecular World with Watercolor Landscapes (p. 64)                                                                        |
| 12 Noon–1:30 PM | 9–12  | B208, GWCC             | Inquiry Physics Experiments from Vernier: No Lab Setup Required! (p. 61)                                                                          |
| 12 Noon–1:30 PM | 6–8   | B201, GWCC             | Shifting to the Five Innovations: Density Phenomena (p. 61)                                                                                       |
| 12 Noon–1:30 PM | 6–12  | B303, GWCC             | Collisions and Restraints: Solving Problems Through Engineering (p. 63)                                                                           |
| 12 Noon–1:30 PM | 8–C   | B217, GWCC             | Inquiry and Modeling-Based Digital Curriculum App for Conceptual Physics/Physical Science (p. 62)                                                 |
| 12:30–1:00 PM   | C     | Hickory, Omni at CNN   | SCST-Sponsored Session: Getting the Most Out of Peer-Led Team Learning (PLTL) Recitation Programs: Training, Organization, and Management (p. 65) |
| 12:30–1:30 PM   | 9–12  | C212, GWCC             | Reaction Rates Phenomena Through Assessment (p. 72)                                                                                               |
| 12:30–1:30 PM   | 8–12  | B401, GWCC             | Using Phenomena in the Physical Sciences (p. 71)                                                                                                  |
| 12:30–1:30 PM   | 3–9   | B309, GWCC             | Dumbledore’s Transfiguration Class: Science and Magic from Hogwarts Academy (p. 66)                                                               |
| 12:30–1:30 PM   | 5–8   | C302, GWCC             | Ready-STEM-Go: Use Rubber Band-Powered Cars to Drive a Cross-Curricular Unit (p. 72)                                                              |
| 12:30–1:30 PM   | K–8   | A301, GWCC             | California Science Project Session: Supporting English Language Learners Sense Making in Science (p. 66)                                          |
| 12:30–1:30 PM   | P–8   | C206, GWCC             | Sound and Waves (PS4): An Integrated K–8 Hands-On Approach Supporting the NGSS and CCSS ELA (p. 71)                                               |
| 12:30–1:30 PM   | 3–12  | B301, GWCC             | Demystifying Phenomenon: Earthquake-Proof Towers and Engineering Design (p. 73)                                                                   |
| 12:30–1:30 PM   | 6–12  | C301, GWCC             | Tesla Tales (p. 68)                                                                                                                               |
| 12:30–1:30 PM   | K–2   | A405, GWCC             | Made for the Shade: A SUN-Sational Engineering Design Unit (p. 70)                                                                                |
| 12:30–1:30 PM   | 8–C   | Walnut, Omni at CNN    | High School Science OER Course Project (p. 69)                                                                                                    |
| 12:30–1:30 PM   | 3–8   | A403, GWCC             | Evidence and Explanations: Energy Changes and Transformations in a Bouncing, Flashing Ball (p. 70)                                                |
| 12:30–1:30 PM   | 5–12  | Dogwood A, Omni at CNN | Tools of the Trade: 3-D Science in the Everyday Classroom (p. 72)                                                                                 |
| 12:30–1:30 PM   | 9–12  | B315, GWCC             | What’s in the Water? Colorimetry and Conductivity of Solutions (p. 74)                                                                            |
| 1:00–1:30 PM    | 6–8   | A312, GWCC             | Meet Me in the Middle Session: Engineering in Middle School Chemistry (p. 77)                                                                     |
| 2:00–3:00 PM    | 9–12  | C302, GWCC             | 3-D Learning in High School Physics (p. 85)                                                                                                       |
| 2:00–3:00 PM    | K–5   | A405, GWCC             | See It All! Explore Science and Engineering Through a Literacy Lens (p. 84)                                                                       |
| 2:00–3:00 PM    | 6–12  | C213, GWCC             | How to Design a Hands-On Inquiry Lab for Physics/Physical Science (p. 82)                                                                         |
| 2:00–3:00 PM    | K–12  | B102, GWCC             | NGSS@NSTA Forum Session: <i>Interactions</i> : A Free 3-D Science Curriculum for Ninth Grade Physical Science (p. 84)                             |
| 2:00–3:00 PM    | 3–12  | C206, GWCC             | Heat, Energy, and Matter (CCC5, PS3): An Integrated Grades 3–12 Hands-On Approach Supporting the NGSS and CCSS ELA (p. 85)                        |
| 2:00–3:00 PM    | 6–12  | C301, GWCC             | Struggling to Teach Chemistry Concepts? Help Is on the Way! (p. 82)                                                                               |
| 2:00–3:00 PM    | 5–9   | C207, GWCC             | Scientists Becoming RACERS: Articulating Complex Discoveries (p. 82)                                                                              |
| 2:00–3:00 PM    | 5–9   | C212, GWCC             | Geomagnetism—From the Solar Wind to Power System Impacts (p. 85)                                                                                  |
| 2:00–3:30 PM    | 3–C   | B207, GWCC             | AP Chemistry with Vernier (p. 88)                                                                                                                 |
| 2:00–3:30 PM    | 9–11  | B305, GWCC             | Chemical Formula and Amino Acids (p. 89)                                                                                                          |
| 2:00–3:30 PM    | 9–C   | B203, GWCC             | Green Chemistry Experiments for General and AP Chemistry (p. 87)                                                                                  |
| 2:00–3:30 PM    | 9–12  | B208, GWCC             | Physics with Vernier (p. 88)                                                                                                                      |
| 2:00–3:30 PM    | 1–8   | B313, GWCC             | Elementary Teacher Survival Kit (p. 90)                                                                                                           |
| 2:00–3:30 PM    | K–5   | B201, GWCC             | Smithsonian Engineering: Sending Coded Messages Using Sound (p. 87)                                                                               |
| 2:00–3:30 PM    | 6–12  | B213, GWCC             | When Zombies Attack! (p. 88)                                                                                                                      |
| 3:00–4:30 PM    | 4–8   | B409, GWCC             | Explore Renewable Energy with Hands-On Activities (p. 93)                                                                                         |
| 3:30–4:30 PM    | 7–12  | B316, GWCC             | STEM Activity: Better Bridge Building! (p. 101)                                                                                                   |
| 3:30–4:30 PM    | 9–12  | C212, GWCC             | Exploring Visible and Infrared Light and Energy in a 3-D Learning Setting (p. 100)                                                                |
| 3:30–4:30 PM    | K     | B402, GWCC             | Sliders, Blocks, Fences, and Mazes: Kindergarten Physics and Engineering (p. 99)                                                                  |
| 3:30–4:30 PM    | 6–8   | A311, GWCC             | Scaffolding the Crosscutting Concepts: Tools for 3-D Thinking in Middle School (p. 96)                                                            |
| 3:30–4:30 PM    | 6–C   | C206, GWCC             | Engineering Design Journals: Trials and Tribulations (p. 99)                                                                                      |

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|--------------|------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3:30–4:30 PM | K–12 | B102, GWCC                 | NGSS@NSTA Forum Session: How Can Light Help Me See and Communicate with Others? A Storyline Designed to Support 3-D Learning in an Early Elementary Classroom (p. 99) |
| 3:30–4:30 PM | 9–12 | A302, GWCC                 | Analysis of Supernova Remnants Using X-Ray Spectroscopy with NASA Data and STEM Tools (p. 98)                                                                         |
| 3:30–4:30 PM | 5–12 | Grand Blrm. B, Omni at CNN | Drone/UAV Lessons for Science and STEM Education (p. 100)                                                                                                             |
| 3:30–4:30 PM | 3–5  | A402, GWCC                 | Justifying Predictions About Energy Transfer: Students' Use of Evidence and Reasoning in 3-D Learning (p. 98)                                                         |
| 3:30–4:30 PM | K–5  | B401, GWCC                 | Phenomenal Mysteries and Probes in Science (p. 99)                                                                                                                    |
| 3:30–4:30 PM | K–8  | A316, GWCC                 | STEMgenuity (p. 98)                                                                                                                                                   |
| 3:30–4:30 PM | 7–12 | C302, GWCC                 | Teaching Chemical Reactions Through a Variety of Modalities (p. 100)                                                                                                  |
| 3:30–4:30 PM | 4–12 | C301, GWCC                 | EnergyWhiz: Engaging Underserved Students as Energy Problem-Solvers (p. 96)                                                                                           |
| 3:30–4:30 PM | K–6  | A403, GWCC                 | Transforming the “Oldies”: Make Phenomena and Modeling Inspire Your Next Generation Learners (p. 98)                                                                  |
| 3:30–4:30 PM | 5–8  | C211, GWCC                 | Exploration Questions: A Simple Way to Move Toward 3-D Teaching, Learning, and Assessment (p. 100)                                                                    |
| 4:00–5:30 PM | 9–11 | B305, GWCC                 | pH Scale (p. 104)                                                                                                                                                     |
| 4:00–5:30 PM | 9–C  | B214, GWCC                 | See Science in a Whole New Light with Thermal Imaging (p. 103)                                                                                                        |
| 4:00–5:30 PM | 4–12 | B218, GWCC                 | JASON Learning Inspiring All Learners, Building STEM Communities (p. 104)                                                                                             |
| 4:00–5:30 PM | 8–C  | B403, GWCC                 | Get A Move On! Modeling Molecular Transport Across the Cell Membrane (p. 105)                                                                                         |
| 4:00–5:30 PM | 7–12 | B215, GWCC                 | Hands-On Approach to Teach Electricity in Japan (p. 103)                                                                                                              |
| 4:00–5:30 PM | 6–12 | B213, GWCC                 | Are You Moody? (p. 103)                                                                                                                                               |
| 4:00–5:30 PM | 7–C  | B208, GWCC                 | Renewable Energy with KidWind and Vernier (p. 103)                                                                                                                    |
| 5:00–5:30 PM | 9–12 | C301, GWCC                 | 3-D Learning with GPB's Physics in Motion Series (p. 106)                                                                                                             |
| 5:00–5:30 PM | 6–C  | Magnolia, Omni at CNN      | Applying STEM Models of Instruction: Synectics Teaching (p. 107)                                                                                                      |
| 5:00–6:00 PM | K–2  | C205, GWCC                 | Advancing Children's Science Literacy and Knowledge Through Traditional Texts and Digital Media (p. 110)                                                              |
| 5:00–6:00 PM | 6–8  | C212, GWCC                 | Middle School Chemistry: Carbon Dioxide and Changes to the Ocean (p. 111)                                                                                             |
| 5:00–6:00 PM | 6–12 | A305, GWCC                 | Using NGSS Science and Engineering Practices to Study Climate Change (p. 109)                                                                                         |
| 5:00–6:00 PM | 6–12 | B402, GWCC                 | Let's Get Vertical (p. 110)                                                                                                                                           |
| 5:00–6:00 PM | 3–8  | A410, GWCC                 | Fun Weird Science Phenomena (p. 110)                                                                                                                                  |
| 5:00–6:00 PM | 6–12 | C211, GWCC                 | Animal Multimedia Inspires Learning and Engagement (p. 111)                                                                                                           |
| 5:00–6:00 PM | 4–C  | C302, GWCC                 | Using Authentic Ocean Data to Meet the NGSS (p. 111)                                                                                                                  |
| 5:00–6:00 PM | 1–3  | B212, GWCC                 | “The Sheep Are in the Jeep”: Forces and Motion (p. 108)                                                                                                               |
| 5:30–6:00 PM | 9–12 | C301, GWCC                 | Integrating the Engineering Design Process with Forces and Motion (p. 112)                                                                                            |

### General Science Education: Friday

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|--------------|------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| 8:00–8:30 AM | C    | Hickory, Omni at CNN       | SCST-Sponsored Session: Hitting the Mark? Rigor, Reflection, and Results of Co-Teaching a STEM Standards-Based Competency Program (p. 16) |
| 8:00–8:30 AM | 5–12 | B212, GWCC                 | Lab Reports and Expository Writing: Emphasizing the Nature of Science in Practice (p. 15)                                                 |
| 8:00–8:30 AM | K–12 | Walnut, Omni at CNN        | NASA in Your Classroom! (p. 16)                                                                                                           |
| 8:00–8:30 AM | 9–12 | C212, GWCC                 | Citizen Mapping: Engaging Students in Placed-Based Science Using Geospatial Technologies (p. 16)                                          |
| 8:00–9:00 AM | G    | A408, GWCC                 | Rethinking Science: Cultivating a Culture of Equity and Inclusion (p. 17)                                                                 |
| 8:00–9:00 AM | K–12 | Grand Blrm. A, Omni at CNN | Collaborating with Scientists to Create Authentic STEM Challenges (p. 23)                                                                 |
| 8:00–9:00 AM | G    | Int'l Blrm. C, Omni at CNN | Toward Inclusion of All Learners Through Science Teacher Education (p. 18)                                                                |
| 8:00–9:00 AM | 6–9  | A312, GWCC                 | Using Real Data in the Classroom (p. 20)                                                                                                  |
| 8:00–9:00 AM | K–12 | Juniper, Omni at CNN       | You Can Model That: How to Engage All Students in Authentic Science Modeling (p. 19)                                                      |
| 8:00–9:00 AM | 3–9  | A316, GWCC                 | Dare to Think: Philosophical Dialogue in the Science Class (p. 21)                                                                        |



## Schedule at a Glance General Science Education

|               |         |                                  |                                                                                                                                                              |
|---------------|---------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8:00–9:00 AM  | 4–8     | C205, GWCC                       | Move, Think, Achieve: Promoting Student Engagement Through Activity, Collaboration, and Problem Solving (p. 22)                                              |
| 8:00–9:00 AM  | G       | Magnolia, Omni at CNN            | NSELA-Sponsored Session: Teaching a Culturally Responsive Pedagogy (p. 19)                                                                                   |
| 8:00–9:00 AM  | 6–12    | Dogwood B, Omni at CNN           | The Next Generation of Phenomena-Based Performance Tasks (p. 18)                                                                                             |
| 8:00–9:00 AM  | 6–12    | C213, GWCC                       | Now We Have Our Curriculum, What's Next? NGSS Dissemination (p. 18)                                                                                          |
| 8:00–9:00 AM  | 7–12    | C201, GWCC                       | Stimulate Student Learning with Food! (p. 22)                                                                                                                |
| 8:00–9:00 AM  | 6–8     | C203, GWCC                       | Inherit New Skills: Evolution for Middle School Educators (p. 22)                                                                                            |
| 8:00–9:00 AM  | 4–9     | B401, GWCC                       | Three Dimensionality in Middle School Science Through the Use of a 6Es Instructional Model (p. 21)                                                           |
| 8:00–9:00 AM  | 2–12    | Maple A/B, S. Tower, Omni at CNN | Reading, Writing, and Speaking Science (p. 19)                                                                                                               |
| 8:00–9:00 AM  | 6–12    | Spruce, S. Tower, Omni at CNN    | ASTE-Sponsored Session: CONnected! (p. 23)                                                                                                                   |
| 8:00–9:00 AM  | K–5     | Grand Blrm. C, Omni at CNN       | CSSS-Sponsored Session: Supporting Language and Literacy Through 3-D Science Instruction in Early Grades (p. 18)                                             |
| 8:00–9:00 AM  | 3–8     | B301, GWCC                       | STEMrangers: Making Science Night Meaningful (p. 24)                                                                                                         |
| 8:00–9:00 AM  | K–12    | A304, GWCC                       | Integrating E-Books into the Secondary Classroom (p. 16)                                                                                                     |
| 8:00–9:00 AM  | 6–12    | B402, GWCC                       | PlantingScience: Growing Students' Science Understanding Through Independent Investigations and Online Mentoring (p. 22)                                     |
| 8:00–9:00 AM  | 8–11    | C301, GWCC                       | Advantages or Disadvantages to Using Polymers in Our Environment (p. 18)                                                                                     |
| 8:00–9:00 AM  | 6–12    | A314, GWCC                       | Using Performance Expectations to Plan for Classroom Assessments (p. 21)                                                                                     |
| 8:00–9:00 AM  | K–12    | B102, GWCC                       | NGSS@NSTA Forum Session: Looking for NGSS-Focused Instructional Materials? (p. 21)                                                                           |
| 8:00–9:30 AM  | 6–C     | B214, GWCC                       | Rock the NGSS with Electric Guitars! (p. 25)                                                                                                                 |
| 8:00–9:30 AM  | K–5     | B302, GWCC                       | Engage Students in FOSS Next Generation K–5 (p. 26)                                                                                                          |
| 8:00–9:30 AM  | K–5     | B314, GWCC                       | Claims, Evidence, and Reasoning in Action (p. 27)                                                                                                            |
| 8:00–9:30 AM  | 6–12    | B304, GWCC                       | Set the Scene for Science Discovery with Forensics (p. 26)                                                                                                   |
| 8:00–9:30 AM  | 9–12    | B204, GWCC                       | Arriving on the Scene: Collect and Analyze Evidence Like the Pros (p. 25)                                                                                    |
| 8:00–9:30 AM  | K–5     | B209, GWCC                       | Science and Engineering Practices in the NGSS (p. 25)                                                                                                        |
| 8:00–9:30 AM  | 3–C     | B407, GWCC                       | Inspiring Individuals and Changing Conversations: Consider Hosting a Film Screening (p. 28)                                                                  |
| 8:00–10:00 AM | P–6     | Exhibit Hall B-1, GWCC           | Elementary Extravaganza (p. 29)                                                                                                                              |
| 8:00–11:00 AM | K–12    | Chastain E, Westin               | SC-5: Designing and Using Three-Dimensional Assessments in Your Classroom (p. 29)                                                                            |
| 8:30–9:00 AM  | C       | Hickory, Omni at CNN             | SCST-Sponsored Session: RETune Our Understanding of Research Experience for Teachers: Teacher Training That Makes a Difference in the K–12 Classroom (p. 30) |
| 8:30–9:00 AM  | 7–12    | A403, GWCC                       | Supporting Students in Creating Investigative Questions (p. 30)                                                                                              |
| 9:30–10:00 AM | 7–12    | A404, GWCC                       | CEEMS: Challenge-Based Learning Units Incorporating Engineering Design with Secondary Science and Math Content (p. 32)                                       |
| 9:30–10:00 AM | K–12    | Birch, Omni at CNN               | A Breath of Fresh Air: A Refreshing Initiative for Outdoor Learning in the Science Curriculum (p. 32)                                                        |
| 9:30–10:30 AM | K–2,6–8 | A315, GWCC                       | Effective Modeling Practices, K–8 (p. 37)                                                                                                                    |
| 9:30–10:30 AM | 6–12    | A405, GWCC                       | The Role of Argumentation in Project-Based Learning (p. 37)                                                                                                  |
| 9:30–10:30 AM | K–12    | Cottonwood A/B, Omni at CNN      | Assessing Student Growth from NGSS: How Do You Know that Your Students Are Really Learning? How Do You Teach Students to Assess Their Own Learning? (p. 39)  |
| 9:30–10:30 AM | G       | A408, GWCC                       | Failure Is NOT an Option—It's Required (p. 34)                                                                                                               |
| 9:30–10:30 AM | K–12    | A304, GWCC                       | Shell Science Teaching Award: Fueling Success with Students \$10K (p. 33)                                                                                    |
| 9:30–10:30 AM | K–12    | B405, GWCC                       | NSTA Press® Session: Building School and District Capacity for Eliciting, Supporting, and Understanding ALL Students' Ideas in Science (p. 34)               |
| 9:30–10:30 AM | K–6     | Magnolia, Omni at CNN            | NSELA-Sponsored Session: Close Reading and Science Texts: What Curriculum Leaders Need to Know (p. 36)                                                       |
| 9:30–10:30 AM | G       | Spruce, S. Tower, Omni at CNN    | ASTE-Sponsored Session: New Teacher Preparation Standards to Meet the Needs of the Framework (p. 39)                                                         |
| 9:30–10:30 AM | K–12    | Juniper, Omni at CNN             | AMSE-Sponsored Session: Tearing Down Walls, Building Up Relationships (p. 36)                                                                                |

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|-----------------|--------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9:30–10:30 AM   | G      | B401, GWCC                       | Phenomenon? Bring It On! (p. 38)                                                                                                                           |
| 9:30–10:30 AM   | 9–12   | C206, GWCC                       | Surviving the Zombie Apocalypse (p. 34)                                                                                                                    |
| 9:30–10:30 AM   | 5–10   | Int'l Blrm. D, Omni at CNN       | STEAM from the Street! (p. 39)                                                                                                                             |
| 9:30–10:30 AM   | K–12   | Int'l Blrm. E, Omni at CNN       | Urban STEMification (p. 36)                                                                                                                                |
| 9:30–10:30 AM   | 4–12   | Maple A/B, S. Tower, Omni at CNN | Science Connections Using Fiction Books (p. 36)                                                                                                            |
| 9:30–10:30 AM   | 5–8    | A403, GWCC                       | Engaging in Scientific Argumentation: How Do I Support My Students in Articulating Their Reasoning? (p. 34)                                                |
| 9:30–10:30 AM   | K–12   | B301, GWCC                       | Science Teacher/STEM Teacher: What's the Difference? (p. 40)                                                                                               |
| 9:30–10:30 AM   | G      | A407, GWCC                       | Robert H. Carleton Lecture: My Teaching Career—the Good, the Bad, the Ugly (p. 33)                                                                         |
| 9:30–11:00 AM   | G      | Grand Blrm. E, Omni at CNN       | Global Initiatives Enhancing Science Education: An International Share-a-Thon and Poster Session (p. 183)                                                  |
| 9:30–11:00 AM   | G      | B206, GWCC                       | Featured Presentation: NASA: Your STEM Connection (p. 41)                                                                                                  |
| 10:00–10:30 AM  | 6–12   | C301, GWCC                       | The Use of Self-Regulated Learning to Help Students Perform Science and Engineering Processes (p. 42)                                                      |
| 10:00–10:30 AM  | 3–12   | Walnut, Omni at CNN              | 3-D Interactive Notebooks Made Equitable, Engaging, and Easy (p. 42)                                                                                       |
| 10:00–10:30 AM  | C      | Hickory, Omni at CNN             | SCST-Sponsored Session: Do Majors and Nonmajors Have Similar Perceptions of Course-Embedded Undergraduate Research Experiences? (p. 42)                    |
| 10:00–10:30 AM  | 6–12   | C207, GWCC                       | Scientific Practices Developed with STEM School Garden Curriculum (p. 42)                                                                                  |
| 10:00–11:30 AM  | K–8    | B209, GWCC                       | Three-Dimensional Learning in the Elementary Classroom (p. 44)                                                                                             |
| 10:00–11:30 AM  | 4–C    | B203, GWCC                       | Support Your Students in Their Scientific Journey with Flinn's Digital Resources (p. 42)                                                                   |
| 10:00–11:30 AM  | K–12   | B218, GWCC                       | Unpacking the NGSS Through Instructional Practices (p. 44)                                                                                                 |
| 10:00–11:30 AM  | K–8    | B304, GWCC                       | NGSS Curriculum Made Easy with Discovery Education™ and Ward's Science (p. 45)                                                                             |
| 10:00–11:30 AM  | 9–12   | B213, GWCC                       | AP Biology Unwrapped: Discover the Keys to AP Exam Success (p. 44)                                                                                         |
| 10:00–11:30 AM  | K–5    | B302, GWCC                       | What Do Crosscutting Concepts Look Like in a Elementary Classroom (p. 45)                                                                                  |
| 10:00–11:30 AM  | K–C    | B312, GWCC                       | GMOs a Hot Topic in the Media, Classroom, and Around the Dinner Table: Panel Discussion and Presentation by Monsanto Company (p. 46)                       |
| 10:00AM–5:00 PM | K–12   | Chastain D, Westin               | SC-8: Developing a Reasonable NGSS Transition Plan for My District or School (p. 49)                                                                       |
| 10:15–10:45 AM  | 5–9    | A411/412b, GWCC                  | Meet Me in the Middle Session: Roundtable Conversations, Session A (p. 50)                                                                                 |
| 11:00–11:30 AM  | 5–8    | A311, GWCC                       | Meet Me in the Middle Session: Safety, the Route to Successful STEM Activities! (p. 51)                                                                    |
| 11:00–11:30 AM  | 9–12   | B211, GWCC                       | "See" Through the Cultural Differences Influencing Student Learning (p. 51)                                                                                |
| 11:00–11:30 AM  | 9–12   | B212, GWCC                       | Reading and Using Data to Make Evidence-Based Claims (p. 51)                                                                                               |
| 11:00–11:30 AM  | 5–9    | A411/412b, GWCC                  | Meet Me in the Middle Session: Roundtable Conversations, Session B (p. 51)                                                                                 |
| 11:00–11:30 AM  | 3–9    | A312, GWCC                       | Meet Me in the Middle Session: Practical Lessons and Demonstrations on a Budget (p. 51)                                                                    |
| 11:00–11:30 AM  | 6–12   | C204, GWCC                       | Not So Hidden Figures: Increasing Student STEM-ulation (p. 52)                                                                                             |
| 11:00–11:30 AM  | 3–5, C | Int'l Blrm. D, Omni at CNN       | Teaching Engineering Design Through STEM to Girls in Underserved School Districts: Increasing the Science Self-Efficacy of Elementary School Girls (p. 52) |
| 11:00AM–12 Noon | K–12   | Cottonwood A/B, Omni at CNN      | Measuring Mastery in 3-D: A Tale of Two Districts' Integration of Standards-Based Grading and the NGSS (p. 59)                                             |
| 11:00AM–12 Noon | P–12   | C206, GWCC                       | iPads to Support Literacy in Science (p. 58)                                                                                                               |
| 11:00AM–12 Noon | 6–C    | Dogwood A, Omni at CNN           | Using Authentic Video Resources to Enhance the Implementation of the NGSS (p. 54)                                                                          |
| 11:00AM–12 Noon | P–12   | Grand Blrm. C, Omni at CNN       | How Do We Make NGSS Storylines Work by Pushing Students to Go Deeper? (p. 54)                                                                              |
| 11:00AM–12 Noon | 3–5    | A404, GWCC                       | Elementary Students Doing Science! NGSS and CCSS: Perfect Together (p. 56)                                                                                 |
| 11:00AM–12 Noon | K–8    | A301, GWCC                       | Transforming Your Classroom Through Meaningful Technology Integration (p. 53)                                                                              |
| 11:00AM–12 Noon | K–8    | A403, GWCC                       | Linking Science and Literacy for Improved Student Outcomes (p. 56)                                                                                         |
| 11:00AM–12 Noon | 5–12   | A304, GWCC                       | Do You Need a New Science Lab? Win \$20K! (p. 53)                                                                                                          |
| 11:00AM–12 Noon | K–5    | B405, GWCC                       | NSTA Press® Session: The Power of Assessing: Guiding Powerful Practices (p. 58)                                                                            |

## Schedule at a Glance General Science Education

|                 |               |                                  |                                                                                                                                                                                                 |
|-----------------|---------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11:00AM–12 Noon | P–12          | Int'l Blrm. C, Omni at CNN       | Science Leaders Roundtable (p. 55)                                                                                                                                                              |
| 11:00AM–12 Noon | 6–12          | C213, GWCC                       | Supporting Three-Dimensional Learning Through the Design of Model-Based Inquiry Units: A New Template to Support Science Teachers (p. 54)                                                       |
| 11:00AM–12 Noon | K–5           | A401, GWCC                       | Evolution of an Elementary Science Lab to an Innovative STEM Lab (p. 53)                                                                                                                        |
| 11:00AM–12 Noon | 9–12          | C210, GWCC                       | Forensics: Closing the Case (p. 54)                                                                                                                                                             |
| 11:00AM–12 Noon | 6–12          | C207, GWCC                       | Visual Literacy Strategies and Formative Assessments...for All! (p. 54)                                                                                                                         |
| 11:00AM–12 Noon | P–6           | A410, GWCC                       | Using Lab Notebooks in the Preschool and Elementary Classroom (p. 56)                                                                                                                           |
| 11:00AM–12 Noon | 3–10          | Maple A/B, S. Tower, Omni at CNN | Meaningful Notebooking! (p. 55)                                                                                                                                                                 |
| 11:00AM–12 Noon | 5–10/<br>12–C | Grand Blrm. A, Omni at CNN       | Connecting the Science and Engineering Practices and Informational Text (p. 59)                                                                                                                 |
| 11:00AM–12 Noon | K–5           | A408, GWCC                       | Using STEM to Bring Parents and Projects into Title I Schools (p. 53)                                                                                                                           |
| 11:00AM–12 Noon | C             | Hickory, Omni at CNN             | SCST-Sponsored Session: OUSTA Winner Presentation: What Types of People Do Science? Investigating Curricular Materials That Highlight Scientist Diversity While Covering Course Content (p. 55) |
| 11:00AM–12 Noon | G             | Magnolia, Omni at CNN            | NSELA-Sponsored Session: The Delaware NGSS Teacher Leader Program (p. 55)                                                                                                                       |
| 11:00AM–12 Noon | 9–12          | B401, GWCC                       | How to Transition to 3-D Standards-Based Grading (p. 53)                                                                                                                                        |
| 11:00AM–12 Noon | 1–C           | Spruce, S. Tower, Omni at CNN    | NARST-Sponsored Session: Participatory Action Research Using Annotated Videos to Promote Reflective STEM Practice Presented at NARST 90th Annual International Conference (p. 59)               |
| 11:00AM–12 Noon | 3–C           | A303, GWCC                       | CESI-Sponsored Session: Using Interactive Technologies in the Classroom (p. 53)                                                                                                                 |
| 11:00AM–12 Noon | 3–12          | B216, GWCC                       | Incorporating the NGSS Crosscutting Concepts into Your Teaching (p. 59)                                                                                                                         |
| 11:00AM–12 Noon | G             | B309, GWCC                       | Featured Presentation: Science Is to STEM as Coffee Is to Starbucks: Real-World, Relevant, and Grounds for the Perfect Integration (p. 52)                                                      |
| 11:00AM–12 Noon | K–12          | B301, GWCC                       | Using Argumentation for Discussing Phenomena and Increasing Student Voice about STEM (p. 59)                                                                                                    |
| 11:30AM–12 Noon | 9–C           | B212, GWCC                       | Law and Order in the High School Chemistry Classroom: Using a Mock Trial to Discuss Scientific Concepts and Ethics (p. 60)                                                                      |
| 11:30AM–12 Noon | 4–8,C         | Int'l Blrm. D, Omni at CNN       | Girls in Engineering, Mathematics and Science (GEMS): University and School Collaborative (p. 60)                                                                                               |
| 11:30AM–12 Noon | 9–12          | C204, GWCC                       | Breaking Barriers: Engaging Girls in STEM Fields Using Role Models and Student-Created Media (p. 60)                                                                                            |
| 12 Noon–1:30 PM | K–12          | B218, GWCC                       | Making “STEM Available”(p. 62)                                                                                                                                                                  |
| 12 Noon–1:30 PM | K–8           | B209, GWCC                       | Integrating Crosscutting Concepts into Your Classroom (p. 61)                                                                                                                                   |
| 12 Noon–1:30 PM | G             | B304, GWCC                       | Comparative Anatomy of a Grant (p. 63)                                                                                                                                                          |
| 12 Noon–1:30 PM | 6–8           | B302, GWCC                       | What Do Crosscutting Concepts Look Like in a Middle School Classroom? (p. 62)                                                                                                                   |
| 12 Noon–1:30 PM | K–8           | B404, GWCC                       | Assessment for Learning in the Age of NGSS: Revealing Student Thinking and Taking Action (p. 64)                                                                                                |
| 12 Noon–1:30 PM | G             | B408, GWCC                       | Catalyzing Your NGSS Implementation K–12 (p. 64)                                                                                                                                                |
| 12:30–1:00 PM   | K–8           | A303, GWCC                       | Podcasting into the 21st Century Through Science Research (p. 65)                                                                                                                               |
| 12:30–1:00 PM   | 7–12          | C204, GWCC                       | 3-D STEAM Projects Improve Independence and Perseverance in a High-Poverty Community (p. 65)                                                                                                    |
| 12:30–1:30 PM   | P–12          | Magnolia, Omni at CNN            | NSELA-Sponsored Session: Leadership Strategies Using NGSS as a Foundation to Ensure Each Student Has a STEM Future (p. 69)                                                                      |
| 12:30–1:30 PM   | C             | Spruce, S. Tower, Omni at CNN    | ASTE-Sponsored Session: Flipping the Science Content Classroom for Preservice Elementary Teachers with the NSTA Learning Center (p. 72)                                                         |
| 12:30–1:30 PM   | P–3           | B211, GWCC                       | Inclusive STEM Centers—It's More Than Content: Lessons from My Second Graders (p. 71)                                                                                                           |
| 12:30–1:30 PM   | K–12          | Grand Blrm. C, Omni at CNN       | NARST-Sponsored Session: Understanding Crosscutting Concepts in 3-D Science Learning: Strategies for Designing Lessons and Assessments (p. 68)                                                  |
| 12:30–1:30 PM   | 9–C           | B212, GWCC                       | Improving Science Practices Through Evaluating Scientific Journal Articles (p. 71)                                                                                                              |
| 12:30–1:30 PM   | K–12          | Maple C, S. Tower, Omni at CNN   | Using Fiction Books to Teach STEM (p. 69)                                                                                                                                                       |
| 12:30–1:30 PM   | G             | Int'l Blrm. C, Omni at CNN       | What's App, Doc: Using Technology in Professional Learning (p. 68)                                                                                                                              |

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|---------------|-------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 12:30–1:30 PM | K–12  | A402, GWCC                    | STEAM PBL: Integrating 3-D Science with 21st-Century Skills (p. 70)                                                                                 |
| 12:30–1:30 PM | 10–12 | C209, GWCC                    | CSI in a Differentiated Classroom (p. 71)                                                                                                           |
| 12:30–1:30 PM | K–5   | A404, GWCC                    | Scientific Explanations for the Young Scholar (p. 70)                                                                                               |
| 12:30–1:30 PM | P–12  | A304, GWCC                    | Eureka! Science Trade Books—Good as Gold! (p. 66)                                                                                                   |
| 12:30–1:30 PM | K–12  | Dogwood B, Omni at CNN        | Claims, Evidence, and Reasoning (CER) and Interactive Word Walls (p. 68)                                                                            |
| 12:30–1:30 PM | K–8   | A315, GWCC                    | Developing STEM Lessons with Authentic Integration of Science and Math (p. 69)                                                                      |
| 12:30–2:30 PM | G     | Cottonwood A/B, Omni at CNN   | CSSS-Sponsored Session: Formative Assessments of Learners’ Interests, Identities, and Knowledge (p. 75)                                             |
| 12:45–1:30 PM | G     | Exhibits Entrance, GWCC       | “Meet and Greet” the Presidents and Board/Council (p. 75)                                                                                           |
| 1:00–1:30 PM  | C     | Hickory, Omni at CNN          | SCST-Sponsored Session: Improving Student Accessibility for Diverse Student Populations in Core Curriculum Science Coursework (p. 76)               |
| 1:00–1:30 PM  | 6–8   | A311, GWCC                    | Meet Me in the Middle Session: Assessment in Three Dimensions (p. 76)                                                                               |
| 1:00–1:30 PM  | 6–12  | C204, GWCC                    | Building Cultural Competence and Critical Consciousness Through Science (p. 76)                                                                     |
| 1:45–2:15 PM  | 3–11  | A312, GWCC                    | Meet Me in the Middle Session: Are You Growing as a Teacher? (p. 77)                                                                                |
| 2:00–2:30 PM  | C     | Hickory, Omni at CNN          | SCST-Sponsored Session: Exploring the Use of Lesson Study to Develop Preservice Teachers’ Pedagogical Content Knowledge in Science Teaching (p. 78) |
| 2:00–2:30 PM  | 6–C   | Int’l Blrm. D, Omni at CNN    | Creating STEM Middle School to College Pipeline for Underrepresented Students by Partnering High-Needs School Districts with HBCU (p. 78)           |
| 2:00–3:00 PM  | K–6   | A401, GWCC                    | Front and Center STEM: Unifying a K–6 School Around a STEM Curriculum (p. 80)                                                                       |
| 2:00–3:00 PM  | G     | A304, GWCC                    | Sing for the Planet (p. 80)                                                                                                                         |
| 2:00–3:00 PM  | P–5   | A410, GWCC                    | Story Starts to STEM: Using Children’s Literature to Engage Young Students in STEM (p. 84)                                                          |
| 2:00–3:00 PM  | P–12  | Grand Blrm. B, Omni at CNN    | Excellence through Self-Efficacy—Engaging the Less Engaged (p. 86)                                                                                  |
| 2:00–3:00 PM  | K–12  | Dogwood B, Omni at CNN        | Leading NGSS Implementation in Districts (p. 86)                                                                                                    |
| 2:00–3:00 PM  | G     | Grand Blrm. A, Omni at CNN    | Successful Classroom Strategies for Urban Science Educators (p. 82)                                                                                 |
| 2:00–3:00 PM  | K–5   | B405, GWCC                    | NSTA Press® Session: <i>Picture-Perfect STEM Lessons, K–5</i> (p. 84)                                                                               |
| 2:00–3:00 PM  | 1–10  | Int’l Blrm. F, Omni at CNN    | Crosscutting Concepts in Your School Yard (p. 86)                                                                                                   |
| 2:00–3:00 PM  | G     | B309, GWCC                    | Advocating for Science Education (p. 80)                                                                                                            |
| 2:00–3:00 PM  | 6–8   | A301, GWCC                    | Cross-Content Literacy Strategies That Work! Infusing Literacy in the Middle School Science Classroom (p. 80)                                       |
| 2:00–3:00 PM  | K–8   | A407, GWCC                    | Teaching Literacy Strategies to Enable K–8 Students to Read Science Content with Understanding (p. 80)                                              |
| 2:00–3:00 PM  | G     | Walnut, Omni at CNN           | Launching Cross-District Instructional Resources Through Task Force Processes (p. 83)                                                               |
| 2:00–3:00 PM  | 3–12  | Int’l Blrm. C, Omni at CNN    | 100+ Ways to Engage Students! (p. 82)                                                                                                               |
| 2:00–3:00 PM  | G     | Magnolia, Omni at CNN         | NSELA-Sponsored Session: Developing a Successful STEM Ecosystem: A Large Urban District’s Journey to STEM Achievement (p. 83)                       |
| 2:00–3:00 PM  | 1–6   | A402, GWCC                    | CESI-Sponsored Session: Transforming and Creating “Predict, Observe, Explain” Sequences for Lower Elementary Science (p. 83)                        |
| 2:00–3:00 PM  | 3–8   | Spruce, S. Tower, Omni at CNN | ASTE-Sponsored Session: Hands-On Performance Assessment of the NGSS: An Effective Formative Assessment Strategy for 3-D Learning (p. 86)            |
| 2:00–3:00 PM  | G     | Grand Blrm. C, Omni at CNN    | AMSE-Sponsored Session: Unpacking Race in a Science Classroom (p. 82)                                                                               |
| 2:00–3:00 PM  | 4–8   | A316, GWCC                    | Science and Literacy: Content Area Strategies for Nurturing Young Scientists (p. 83)                                                                |
| 2:00–3:00 PM  | 9–12  | B216, GWCC                    | Science Denial: Where Does It Come From? What Can Science Educators Do About It? (p. 86)                                                            |
| 2:00–3:00 PM  | 3–5   | B206, GWCC                    | Featured Presentation: Premiere of Generation Genius: An Entertaining NGSS Video Series Made in Partnership with NSTA (p. 79)                       |
| 2:00–3:30 PM  | K–12  | B314, GWCC                    | How to Teach Science with Minecraft (p. 90)                                                                                                         |
| 2:00–3:30 PM  | K–5   | B408, GWCC                    | Bringing the World into Your Classroom with National Geographic Explorers (p. 92)                                                                   |
| 2:00–3:30 PM  | 5–12  | B407, GWCC                    | Crash Science Website Launched! Free STEM Activities, Videos, and More (p. 92)                                                                      |

## Schedule at a Glance General Science Education

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|--------------|------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2:00–3:30 PM | 3–10 | B214, GWCC                       | Science Magazines: Where Literacy Meets Phenomenon-Based Learning (p. 88)                                                                              |
| 2:00–3:30 PM | K–12 | B215, GWCC                       | Stop Creating Lesson Plans: Start Creating Learning Experiences (p. 88)                                                                                |
| 2:00–3:30 PM | 6–8  | B302, GWCC                       | Developing Models for Sensory Receptors (p. 89)                                                                                                        |
| 2:00–3:30 PM | 9–C  | B310, GWCC                       | Get That Grant Money! (p. 90)                                                                                                                          |
| 2:00–3:30 PM | K–8  | Maple A/B, S. Tower, Omni at CNN | Igniting Student Interest in STEM for College and Career Readiness (p. 87)                                                                             |
| 2:00–3:30 PM | K–12 | B312, GWCC                       | Science Vocabulary Has Kinetic Energy When It's Moving (p. 90)                                                                                         |
| 2:30–3:00 PM | C    | Hickory, Omni at CNN             | SCST-Sponsored Session: Analyzing Critical-Thinking Patterns and Decision-Making Processes Using the Online Platform Finding QED (p. 92)               |
| 2:30–3:00 PM | G    | Birch, Omni at CNN               | A School Makerfaire for All (p. 92)                                                                                                                    |
| 2:30–3:00 PM | 6–12 | C204, GWCC                       | Classroom Objectives That Impact Student Learning (p. 92)                                                                                              |
| 2:30–4:30 PM | 3–8  | A411/412b, GWCC                  | Meet Me in the Middle Session: Middle Level Share-a-Thon (p. 93)                                                                                       |
| 3:00–6:00 PM | K–12 | Chastain H, Westin SC-9:         | Putting the Pieces Together: Introduction and Implementation of 3-D Learning (p. 93)                                                                   |
| 3:30–4:00 PM | 10–C | Pine, Omni at CNN                | Building Community and Cultivating Success in STEM Through the Women in Science & Engineering (WiSE) Program at the University of Nevada, Reno (p. 94) |
| 3:30–4:00 PM | K–5  | B212, GWCC                       | Creating Opportunities to Capitalize on Literacy for Sense-Making in K–5 Science (p. 94)                                                               |
| 3:30–4:30 PM | G    | A301, GWCC                       | NARST-Sponsored Session: I AM STEM: Transforming the Face of STEM One Community at a Time (p. 95)                                                      |
| 3:30–4:30 PM | 6–8  | A303, GWCC                       | NGSS for All Learners Using Four-Part Performance Tasks (p. 95)                                                                                        |
| 3:30–4:30 PM | 6–12 | C209, GWCC                       | Developing NGSS Rubrics and Tasks Using Marzano's Taxonomy (p. 100)                                                                                    |
| 3:30–4:30 PM | 9–11 | Dogwood A, Omni at CNN           | Got Tech? Now What? Using Technology for Formative Assessment (p. 97)                                                                                  |
| 3:30–4:30 PM | 5–9  | Spruce, S. Tower, Omni at CNN    | AMSE-Sponsored Session: Hands On and Easy—Stimulate Learning for Diverse Learners (p. 97)                                                              |
| 3:30–4:30 PM | G    | Int'l Blrm. E, Omni at CNN       | CSSS-Sponsored Session: Engaging Students in Using the Crosscutting Concepts to Make Sense of Phenomena (p. 100)                                       |
| 3:30–4:30 PM | G    | Magnolia, Omni at CNN            | NSELA-Sponsored Session: Developing and Exploring a Culture of STEM (p. 97)                                                                            |
| 3:30–4:30 PM | 3–12 | B301, GWCC                       | STEM Literacy Strategies for Making Science Concepts Comprehensible (p. 101)                                                                           |
| 3:30–4:30 PM | 3–12 | Dogwood B, Omni at CNN           | Develop Three-Dimensional Assessments for NGSS Performance Expectations (p. 97)                                                                        |
| 3:30–4:30 PM | G    | Int'l Blrm. C, Omni at CNN       | The Top Ten Safety Issues in the Science Classroom/Laboratory You Need to Know! (p. 97)                                                                |
| 3:30–4:30 PM | 6–12 | C207, GWCC                       | Incorporating NGSS in Transdisciplinary Project-Based Learning (p. 96)                                                                                 |
| 3:30–4:30 PM | P–8  | A304, GWCC                       | STEM and Trade Books: Strange Bedfellows (p. 95)                                                                                                       |
| 3:30–4:30 PM | G    | B309, GWCC                       | Featured Presentation: Engaging All Students in Science (p. 95)                                                                                        |
| 3:30–4:30 PM | K–12 | B216, GWCC                       | Using Problem-Based Learning to Up Your NGSS Game (p. 101)                                                                                             |
| 3:30–5:30 PM | K–5  | A314, GWCC                       | Science and Literacy in the K–5 Classroom (p. 101)                                                                                                     |
| 4:00–4:30 PM | P–5  | A401, GWCC                       | STEM and the Urban Elementary Classroom (p. 102)                                                                                                       |
| 4:00–4:30 PM | K–5  | B212, GWCC                       | I Want to Notebook, Too! How to Begin from Beginners (p. 102)                                                                                          |
| 4:00–4:30 PM | 5–12 | Birch, Omni at CNN               | Helping Students to Think Like a Scientist! (p. 102)                                                                                                   |
| 4:00–4:30 PM | 3–C  | Pine, S. Tower, Omni at CNN      | Creating Access to STEM Enrichment for Girls in Rural Georgia (p. 102)                                                                                 |
| 4:00–5:30 PM | 6–8  | B209, GWCC                       | Performance Assessments: Engaging and Fun! (p. 103)                                                                                                    |
| 4:00–5:30 PM | 6–12 | B217, GWCC                       | Bringing Standards-Based Nanotechnology Lessons into the Secondary Science Classroom: Addressing 3-D Learning (p. 104)                                 |
| 5:00–5:30 PM | 9–12 | C207, GWCC                       | The Role of a Coherent Research-Based Curricular Unit in Mediating Interconnected Understanding of Agricultural Impact Among Students (p. 106)         |
| 5:00–5:30 PM | P–12 | Juniper, Omni at CNN             | Day-to-Day Job Embedded Professional Development Supportive of NGSS Implementation (p. 107)                                                            |
| 5:00–5:30 PM | 5–C  | Walnut, Omni at CNN              | Reducing Barriers: Guiding Students of Color Toward Brighter Futures (p. 107)                                                                          |
| 5:00–5:30 PM | 3–12 | Dogwood A, Omni at CNN           | Making Makers: Mind-Set Shifting Activities to Support a Culture of Problem-Solving in the Science Classroom (p. 107)                                  |
| 5:00–6:00 PM | 2–8  | A407, GWCC                       | Using SMART Questions to Boost Your Students' Science Literacy (p. 108)                                                                                |
| 5:00–6:00 PM | 5–C  | Spruce, S. Tower, Omni at CNN    | Tips and Tricks for Integrating Data, Data Science, and NGSS Science Practices into Any Science Classroom (p. 111)                                     |



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| 5:00–6:00 PM | 6–12 | A313, GWCC                     | Using Primary Sources as Anchoring Phenomena (p. 109)                                                                                                                                       |
| 5:00–6:00 PM | P–5  | A404, GWCC                     | STEM—From Catchphrase to Culture! (p. 109)                                                                                                                                                  |
| 5:00–6:00 PM | 8–12 | Int'l Blrm. E, Omni at CNN     | STEAM Up Your Surroundings (p. 111)                                                                                                                                                         |
| 5:00–6:00 PM | 7–12 | C213, GWCC                     | Calling All New or Almost New Teachers! (p. 108)                                                                                                                                            |
| 5:00–6:00 PM | 3–8  | A315, GWCC                     | STEM: Science Taught for All Minds (p. 109)                                                                                                                                                 |
| 5:00–6:00 PM | 6–12 | C209, GWCC                     | Scoring Gains in Health Literacy (p. 110)                                                                                                                                                   |
| 5:00–6:00 PM | 6–12 | C210, GWCC                     | Developing and Implementing Three-Dimensional Classroom Assessments (p. 110)                                                                                                                |
| 5:00–6:00 PM | K–5  | A401, GWCC                     | Talking the Talk: Fostering a Culture of Productive Science Discourse in the Elementary Classroom (p. 108)                                                                                  |
| 5:00–6:00 PM | 6–C  | Int'l Blrm. C, Omni at CNN     | Linking Literacy in Middle School and High School: Promoting Student Learning in Science and Language Arts Through Argumentation (p. 108)                                                   |
| 5:00–6:00 PM | K–12 | Pine, S. Tower, Omni at CNN    | Putting Research into Practice: Extended NGSS PD in Cook County, Illinois (p. 108)                                                                                                          |
| 5:00–6:00 PM | 6–8  | B405, GWCC                     | NSTA Press® Session: <i>STEM Road Map</i> : Integrated STEM Teaching in Middle School (p. 108)                                                                                              |
| 5:00–6:00 PM | 6–8  | B211, GWCC                     | Using Equitable Assessment Tasks to Engage All Students in 3-D Learning (p. 110)                                                                                                            |
| 5:00–6:00 PM | 5–12 | A304, GWCC                     | ASTC-Sponsored Session: Immersing Students and Teachers in Science Field Research: Developing Collaborations Between Informal Educators, Formal Educators, and Research Scientists (p. 107) |
| 5:00–6:00 PM | K–2  | A403, GWCC                     | Phenomenal Folktales (p. 109)                                                                                                                                                               |
| 5:00–6:00 PM | G    | Dogwood B, Omni at CNN         | Beyond the Laboratory Manual: Cell Phones and Selfies (p. 111)                                                                                                                              |
| 5:30–6:00 PM | 1–12 | Walnut, Omni at CNN            | Personalized Learning: A Framework for Science (p. 113)                                                                                                                                     |
| 5:30–6:00 PM | 3–C  | Maple C, S. Tower, Omni at CNN | Research and Debate on the Evolution of Historical Science and Engineering Theories and Practices (p. 112)                                                                                  |
| 5:30–6:00 PM | G    | Magnolia, Omni at CNN          | Setting Up and Maintaining a Statewide Science Curriculum Consortium to Produce, Review, and Evaluate Resources for NGSS (p. 112)                                                           |
| 5:30–6:00 PM | 4–12 | C206, GWCC                     | Scientific Student Achievement Through Self-Analysis and Reflection (p. 112)                                                                                                                |
| 5:30–6:00 PM | 5–C  | Dogwood A, Omni at CNN         | The Many Many Things You Can Do with Google Classroom! (p. 112)                                                                                                                             |
| 5:30–6:00 PM | 6–12 | C204, GWCC                     | QUIT Teaching! Start Facilitating! Strategies for Creating a Student-Centered Learning Environment (p. 112)                                                                                 |

### Informal Science Education: Friday

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|------------------|------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| 8:00–9:00 AM     | 6–12 | Spruce, S. Tower, Omni at CNN | ASTE-Sponsored Session: CONnected! (p. 23)                                                                                                |
| 8:00–9:00 AM     | 6–8  | B211, GWCC                    | Translating Research-Based Strategies into Science Enrichment (p. 17)                                                                     |
| 8:00–9:00 AM     | K–C  | A303, GWCC                    | Let's Eradicate Mosquito-Borne Diseases! Join a Global Citizen Science Effort to Achieve This! (p. 16)                                    |
| 8:00–9:00 AM     | 2–8  | A407, GWCC                    | Integrating Science and Math Through Citizen Science: MMSA's WeatherBlur Program (p. 17)                                                  |
| 8:00–9:00 AM     | 3–8  | B301, GWCC                    | STEMrangers: Making Science Night Meaningful (p. 24)                                                                                      |
| 8:00–11:00 AM    | K–12 | Chastain I/J, Westin          | SC-6: Citizen Science Projects That Transform Schoolyards into STEM Labs and Help K–12 Students Make Sense of Phenomena in Nature (p. 29) |
| 9:30–10:00 AM    | 7–12 | C205, GWCC                    | Citizen Science Ecosystem Biodiversity in United States and Abroad (with Lemurs!) (p. 32)                                                 |
| 10:00–10:30 AM   | 1–12 | C202, GWCC                    | A Bird in the Hand (p. 41)                                                                                                                |
| 10:00 AM–12 Noon | G    | B101, GWCC                    | Community Connections Featured Presentation and Panel: Spare Parts: Reinventing Engineering Education for the 21st Century (p. 48)        |
| 11:00 AM–12 Noon | K–C  | B103, GWCC                    | NESTA and NOAA Share: NOAA Planet Stewards—Content, Collaboration, and Action (p. 58)                                                     |
| 11:00 AM–12 Noon | 6–C  | Walnut, Omni at CNN           | Reflections on Teaching Baltimore City Science (p. 55)                                                                                    |
| 12:30–1:30 PM    | K–12 | B402, GWCC                    | The InVenture Challenge: Developing Future Innovators Through Invention and Entrepreneurship Experiences (p. 66)                          |

## Schedule at a Glance Informal Science Education

|               |      |                   |                                                                                                                                                                                             |
|---------------|------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12:30–2:30 PM | G    | B101, GWCC        | Community Connections Share-a-Thon (p. 74)                                                                                                                                                  |
| 1:45–2:15 PM  | 5–8  | A311, GWCC        | Meet Me in the Middle Session: Teachers, Youth Support Organizations, and Universities Working Together to Build Strong After-School STEM Learning Programs (p. 77)                         |
| 2:00–3:00 PM  | G    | Pine, Omni at CNN | Field-Based Professional Development: Fostering Community Engagement and Personal Growth for Teachers and Students (p. 83)                                                                  |
| 2:00–3:00 PM  | K–8  | B402, GWCC        | Engaging Your STEM Ecosystem: A Fishy Success Story (p. 80)                                                                                                                                 |
| 2:00–3:30 PM  | K–12 | B314, GWCC        | How to Teach Science with Minecraft (p. 90)                                                                                                                                                 |
| 2:00–3:30 PM  | 6–12 | B304, GWCC        | Lead a STEM Revolution at Your School with Science Olympiad (p. 89)                                                                                                                         |
| 2:30–3:00 PM  | P–8  | C203, GWCC        | Building the Bond Through Family Engagement and Informal Learning (p. 92)                                                                                                                   |
| 5:00–6:00 PM  | 6–8  | A302, GWCC        | Blast Off with Astronomy Club! (p. 109)                                                                                                                                                     |
| 5:00–6:00 PM  | 5–12 | A304, GWCC        | ASTC-Sponsored Session: Immersing Students and Teachers in Science Field Research: Developing Collaborations Between Informal Educators, Formal Educators, and Research Scientists (p. 107) |

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## A

Abbott, Rebecca 28, 46, 64  
 Abshire, Wendy 34  
 Achtemeier, Karen 25  
 Adams, Catrina 22  
 Adkins, Jacqueline 50  
 Ahmann, Regina 92  
 Alc na, Danielle 85  
 Allan, Elizabeth 68  
 Allan, Richard 46  
 Allen, Jessica 100  
 Allen, Joyce 104  
 Almasi, Kama 65  
 Alozie, Nonye 110  
 Anderson, Matt 102  
 Andrews, Sherri 27  
 Angle, Julie 30  
 Annee, Sherry 27  
 Ansberry, Karen 84  
 Appel, Ana 70  
 Argo, Christina 36  
 Arias, Anna Maria 58, 98  
 Armfield, Lorrie 54  
 Artero, Jason 53  
 Atencio-Pacheco, Tomas 100

## B

Bachelder, Beverly 33  
 Bachelder, Robert 33  
 Badders, Bill 56  
 Baek, Jonathan 58  
 Bahnson, Anna 85  
 Baird, Kate 112  
 Balisciano, Nicholas 49  
 Ballenger, Justin 102  
 Banay, Emma 17  
 Barker, Ed 48  
 Barrett-Williams, Donna 29, 93  
 Barrow, Lloyd 70  
 Barstow, Dan 64  
 Bartels, Selina 18, 82  
 Bartley, Tony 51, 83  
 Barton, Angela Calabrese 38  
 Baskett, Amanda 66  
 Bayes, Valerie 27, 46  
 Beck, Brittany 54  
 Bell, Lauren 92  
 Bell, Philip 75  
 Bender, Stephanie 110  
 Benton, Erik 26, 45, 63, 89, 104  
 Berent, Rusti 63

Berg, Alissa 33, 108  
 Berman, Christine 108  
 Berry, Joan 87  
 Berson, Rosemary 109  
 Biernat, Kathy 77  
 Bilash, Borislav 53  
 Billups, Carla 95  
 Bily, Chris 63  
 Binder, Wendy 87  
 Binding, Maia 58, 70  
 Bjerke, Heidi 68  
 Blake, Sherry 82  
 Blake, Stephanie 111  
 Bodzin, Alec 94  
 Boecker, Justine 60  
 Boehne, Bruce 77  
 Bohn, Lisa 68  
 Bolden, LaTonya 52  
 Bonelli, Samantha 89  
 Boone, William 78, 93  
 Bowen, Christopher 38  
 Bowen, G. Michael 17, 51, 83  
 Bowman, Arthur 109  
 Boyd, Andrew 69  
 Brady, Emily 66, 95  
 BradyLong, Kyla 108  
 Brakenridge, Mary Adelaide 28  
 Braswell, Latoya 17  
 Brazeal, Michele 60  
 Britsch, Brenda 60  
 Brock, David 20  
 Brooks, Kathleen 51  
 Brooks, Kristen 99  
 Brosnick, Lisa 85  
 Brown, Brooke 62  
 Brown, James 88  
 Brown, Leigh 90  
 Brown, Lindsey 84  
 Bruegenhemke, James 102  
 Bruker, Dovi 92  
 Brunnett, Stephanie 50  
 Brunsell, Eric 17  
 Bryer, Pamela 20  
 Buesing, Mark 69  
 Bujanda, Sariah 100  
 Burgess, Patricia 16  
 Burns, Elise 53  
 Burton, Megan 108  
 Busey, Amy 17  
 Butler, Malcolm 96  
 Butler, Meganne 96  
 Bутtenfield, Hilary 37

ByersSmall, Beth 83  
 Byrne, Cathy 90  
 Byrne, Ken 90

## C

Caffery, Pam 92  
 Cain, Dennis 17  
 Caldwell, Jessica 96  
 Calogero, Catherine 80  
 Campbell, Alexandra 66  
 Campbell, Brian 26, 45  
 Campbell, Chris 70  
 Campbell, Todd 54, 107  
 Cannon, Kristie 54  
 Caouette, Crystal 97  
 Carden, Jennifer 58  
 Carnes, Lisa 110  
 Carpenter, Shane 60  
 Carrion, Carmen 42  
 Carroll, Daniel 16, 113  
 Carswell, Katherine 38  
 Carter, David 103  
 Carter, Kristen 85  
 Carter, Sarah 74  
 Catalano, Amy 52  
 Cauffiel, Colleen 53  
 Chancey, Melinda 112  
 Chandrasekhar, Meera 62  
 Chapoton, Colleen 21  
 Cheng, Charles 97  
 Chickadel, Deb 56  
 Chierici, Joanna 20  
 Childers, Gina 85  
 Chilinguerian, Amy 51  
 Choi, Sanghee 85  
 Cirinelli, Lacey 26  
 Cisterna, Dante 19  
 Clark, Coral 100  
 Clark, Leisa 16, 101  
 Clarke, Janet 23  
 Clarke-Mayers, Denise 22  
 Clayton, Jamie 78  
 Colazas, William 41  
 Collins, Mandi 37  
 Collins, Susan 112  
 Comer, Michael 24  
 Conerly, Alicia 36  
 Conner, Laura 74  
 Cooper, Nikki 69  
 Cordeira, Kelly 39  
 Cornish, Sara 90  
 Cossette, Joe 41

Costa, Pat 38  
 Cowart, Heather 112  
 Coxon, Steve 80  
 Coy, Stephanie 112  
 Crawford, Jean 110  
 Crawford, Lyla Mae 18  
 Crean, Jason 106  
 Creel, Sally 36, 52, 84  
 Crook, Aubrey 68  
 Crowder, Betty 98  
 Crowther, David 82  
 Cummings, Kristina 99  
 Czajkowski, Kevin 16

## D

Dahlman, LuAnn 21  
 Damelin, Daniel 17, 84  
 Damery, Krista 83  
 Daniels, Melinda 37  
 Danz, Alexandra 32  
 Davis, Jeni 52  
 Day, Brian 69  
 DeLaurentis, Melissa 18  
 Delesbore, Sharon 97  
 De los Santos, Elizabeth 21  
 Demetrikopoulos, Melissa 78  
 Denton, Covey 51  
 Derting, Kimberly 69  
 De Schrijver, Jelle 21  
 DeStef, Anthony 60  
 Deutsch, Amit 51  
 DeVore-Wedding, Bev 86  
 DiSpezio, Michael 46  
 Dixon-Wallace, Kathleen 83  
 Dominguez, Max Vazquez 85  
 Donovan, Leah 25  
 Doran, Erin 65  
 Dorsey, Chad 16, 36  
 Dotti, Kristen 38  
 Dove, Terri 54  
 Dove, Whitney 40  
 Dow, Mirah 16  
 Downey, Elizabeth 82  
 Downward, Alan 61  
 Drew, Vickey 51  
 Duff, Elizabeth 107  
 Duggan-Haas, Don 110  
 Dumars, Julia 100  
 Duncan, Annemarie 102  
 Duncan, Kimberly 100  
 Dutrow, Natalie 63  
 Dye, Rhonda 58

# Index of Participants

---

## E

Eakin, C. Mark 79  
Eales, Sarah 85  
Eastburn, Mark 101  
Easter, Helena 51  
Eberhard, Mark 105  
Eddinger, Candria 72  
Edmondson, Elizabeth 84  
Ellingson, Daniella 50  
Elliott, Jennifer 98  
Embry-Mohr, Chris 36, 68  
Emilsson, Gail 49  
Endicott, Ashley 41  
Ergle, Angela Hope 93  
Erickson, Ryan 94, 102  
Evans, David L. 41, 82  
Evans, Joseph 90  
Evans, Laura 32, 106  
Evans, Tracy 110  
Eye, Julie 94

## F

Fackler, Claire 34, 96  
Farley, Cristina 36  
Farrington, Deborah 44  
Farshori, Kulsum 106  
Fawaz, Jacqueline 38  
Feidler, Jeffrey 27  
Ferguson, Leshan 18  
Fetherling, Suzanne 44  
Fick, Sarah 58, 98  
Figueroa, Manuel 72  
Fiore, Rachel 53  
Fischer, Peter 82  
Fischione, April 45  
Fisher, Diana 68  
Fleming, Kevin 18, 108  
Flemming, Adania 99  
Flowers, Woodie 48  
Floyd, Sonya 53  
Flummerfelt, Karen 60  
Foley, Amy 96  
Fondal, Wesley 102  
Foote, Nancy 34  
Forbes, Cory 19  
Ford, Nicole Lynn 93  
Forest, Craig 48  
Forsythe, Michelle 58  
Foster, Jacob 44  
Fotsch, Fred 88, 103  
Fountain, Brad 45  
Francis, Raymond 30

Frank, Marjorie 27  
Frazier, Richard 30, 54  
Freake, Shu-Yee 99  
French, Donald 32, 42  
Friedersdorf, Lisa 104  
Froschauer, Linda 29  
Fujiwara, Yujiro 22, 56  
Fulco, Charles 51

## G

Gage, Gregory 104  
Garcia, Xochitl 39  
Gardner, Grant 86  
Gargiulo, Jeannie 107  
Gasper, Susan 108  
Gauvin, Marcia 80  
Gawne, Hillary 54  
Gay, Cindy 21, 105  
Gensic, John 65  
Gentry, Kyla 36  
Gerber, Alex 59  
Gerlach, Jonathan 97  
German, Susan 22, 76, 86  
Giannakakis, Constance 54  
Gifford, Nancy 44  
Giuliano, Frank 59  
Giunta, Margaret 109  
Glasner, Lindsay 41, 71, 111  
Glass, Margaret 74  
Glaze, Amanda 23  
Gleason, Joyce 76  
González-Howard, María 34  
Goodner, Pam 83  
Governor, Donna 17, 72, 85  
Goward, Shelby 30  
Gran, Susan 59  
Grant, Claudia 109  
Gray, Ron 54  
Green, Kathryn 22, 99  
Green, Nicole 91  
Grimmke, Tonya 109  
Groening, Leanne 71  
Grover, Tyson 112  
Grymonpre, Kris 109  
Guccione, Jessica 15  
Guy-Gaytán, Candice 56  
Guzzetta, Beth 32

## H

Haage, Mauree 98  
Hagen, Morten 105

Hall, Cynthia 49  
Hall, Penny 96  
Hamilton, Eric 74  
Hammond, Jennifer 51  
Harcourt, Pat 109  
Hardrict-Ewing, Gloria 59  
Harlacher, Ashley 112  
Harman, Pamela 100  
Harmon, Stephanie 19  
Harper, Charles 38  
Harris, Christopher 110  
Harrison, Molly 58, 84  
Harte, Tina 37, 85  
Hartley, Susan 22  
Harvey, Rebecca 22  
Hayes, Laurie 22  
Healy, Nancy 104  
Hedman, Rich 56  
Herald, Christine 50  
Herman, Tim 64, 91, 105  
Hernandez, Ann 74  
Hills, Josiah 64  
Hisim, Nüsret 43  
Hitz, Markus 85  
Hoekenga, Janet 24  
Hofacket, Stephanie 18  
Hoffner, DeLene 80  
Holmes, Jay 49  
Holt, Katrina 96  
Holzer, Margaret 45  
Hooper, LeeAnna 94  
Hooten, Justin 78  
Hoover, Todd 93  
Houseal, Ana 18  
Howard, Sonia 76  
Howarth, John 72  
Hsu, Tom 60, 87, 101  
Hubbard, Brenda 92  
Hubbard, Leesa 98  
Hubenthal, Michael 51  
Huff, Janyce 88  
Huff, Kenneth 19  
Huffling, Lacey 18  
Hunter-Thomson, Kristin 39, 111  
Hurt, Timothy 72  
Hutchens, John 58

## I

Ingram, Erin 19  
Inouye, Martha 18  
Irwin, Kris 50, 51  
Ivory, Sara 99

## J

Jackson, Courtnye 107  
Jackson, Julie 68  
Jackson, Laura 28, 47, 77, 93  
Jacobs, Belinda 71  
Jeganathan, Josephine 15  
Jern, Olivia Swanson 112  
Jeske, Sabine 66, 100  
Jimenez, LeeAnne 80  
Johnson, Candyce 92  
Johnson, Carla 108  
Johnson, Chanel 93  
Johnson, Diane 19  
Johnson, Erin 74  
Johnson, Heather 54  
Johnson, Jennifer 32  
Johnson, Lonnie G. 48  
Joiner, Jennifer 22  
Jones, Bruce 19  
Jones, Griff 92  
Jones, Kelly 59  
Jones, Lee 22  
Joslin, Brittany 66  
Joyner, Elizabeth 85

## K

Kahn, Sami 18  
Kaldaras, Leonora 84  
Kalnite, Pini 92  
Kamas, Becky 65  
Kane, Maggie 69  
Kareem, Bejanae 17  
Karl, Rita 60  
Kastel, Dora 21, 58, 70  
Katovich, Tanya 44  
Katz, Holly 66  
Kaufmann, Brenda 71  
Keeley, Page 34  
Keith, Karin 71, 85  
Kennedy, Christopher 82  
Kennedy, Michael 77  
Kerlin, Steve 37, 107  
Kersey, Amber 76  
Kessler, James 77, 111  
Kilbride, Amy 93  
Kilgore, Gretta 60  
Kimball, Nathan 16  
Kimmel, Courtney 32  
Kincaid, Mike 41  
King, Natalie 95  
Kinsman, Amy 42  
Kirman, Elizabeth 96

Kitagawa, Laura 70  
 Kniel, Kali 89  
 Knippenberg, Lindsay 17  
 Knoell, Donna 80  
 Koker, Mark 26, 45, 63  
 Koller, Herb 28, 47  
 Kolonich, Angela 84  
 Konicek-Moran, Kathleen 71  
 Konicek-Moran, Richard 71  
 Koomen, Michele Hollingsworth 18  
 Kopach, Jennifer 89  
 Koppelman, Gary 33  
 Koppendrayner, Susan 102  
 Kotel, Veronica 34  
 Krehbiel, Matt 21  
 Kruger, Megan 90  
 Kruse, Brian 74  
 Kumpa, Bob 83  
 Kurtz, Nicole 74

## L

Lajvardi, Faridodin "Fred" 48  
 LaLanne, Mechelle 69  
 Lamb, Neil 58  
 Lambert, Gail 92  
 Lambertsen, Sophia 28, 46, 64  
 Lamont, Desmond 103  
 Lampley, Sandra 78  
 Lane, Ariel 112  
 Lanese, Tina 74  
 Langus, Tara 94  
 Lashley, Carl 15  
 Laughner, Lindsay 76  
 Launius, J. Carrie 95  
 Laurence, Wendi 83  
 Le, Dat 54  
 Lebofsky, Larry 69  
 Lederman, Judith 18, 39, 82, 96  
 Lederman, Norman 39, 82, 96  
 Lee, Irene 17  
 Lee, Jason 60, 74  
 Lee, Okhee 95  
 Leifker, Megan 24, 61  
 Lembo, Kay 41  
 Leonard, Ruth 71  
 LePrete, Dawnne 82, 96  
 Lester, Lindsay 65  
 Levine, Joseph 86  
 Levine, Samantha 92  
 Levites, Lauren 50  
 Lewis, Gary 17, 108

Lewis, Katherine 51  
 Lewis, Prisca 50  
 Lilly, Cindy 50, 51  
 Lipscomb, Mary Lou 50, 51  
 Little, Tonya 38  
 Loesing, Mary 97  
 Loomis, Kimberly 112  
 Lottero-Perdue, Pamela 99  
 Lowery, Andrea 65  
 Lowrie, Katie 106  
 Lowry, Andrew 107  
 Lucci, Karen 27  
 Luetkenhaus, Julia 100  
 Lukens, Jeffrey 88  
 Lunsford, Tami 33  
 Lyons, Renee' 96  
 Lyu, Xiaoxin 51

## M

MacPhee, Melissa 105  
 MacPherson, Anna 70  
 Madden, Diane 70  
 Madden, Krystal 110  
 Malone, Kathy 78, 93  
 Mannarino, Anne 84  
 Marchi, Lisa 17, 108  
 Marcik, Michal 103  
 Marco-Bujosa, Lisa 34  
 Marconi, Jill 72  
 Marcum-Dietrich, Nanette 16, 37, 107  
 Markowitz, Dina 85  
 Marrero, Meghan 111  
 Martin, Amanda 102  
 Martin, Tim 106  
 Martin-Hansen, Lisa 21  
 Marvel, Mike 42  
 Massengill, Gordon 44  
 Materne, Amy 99  
 Matthews, Diane 64  
 Matthews, Philip 71  
 Mayer, Kristin 84  
 McAuliffe, Carla 21  
 McCafferty, Anita Stewart 39  
 McCarthy, Kelly 69  
 McCaughan, Lauren 37  
 McCleary, Meghan 108  
 McCormack, Alan 66  
 McCormick, Morris 101  
 McCoy, Wesley 32  
 McCulloch, Amber 18  
 McDaniel, Colleen 25, 88, 103  
 McDavis, Kolenda 99  
 McDermott, Stefanie 74  
 McDonald, Jim 53, 83  
 McDowell, Helen 92  
 McGill, Tara 99  
 McGinnis, Patty 51  
 McGough, Julie 58  
 McGrail, Christine 56  
 McGrath, Edward 55, 97  
 McIntosh, Jennifer 98  
 McIntosh, Linda 107  
 McKenna, Acacia 82  
 McKenna, Thomas 54, 107  
 McMillan, Terra 18  
 McNeill, Katherine 34  
 Mead, Margaret 88  
 Mears, Ashley 15  
 Menchon, Norma 94  
 Mercer, Jackie 34  
 Metcalf, Hillary Paul 53  
 Meyer, Steve 25  
 Micco, Laura 37  
 Miles, Rhea 38  
 Miller, Kenneth 73, 86  
 Miller-Kleinhenz, Jasmine 74  
 Mills, Kat 26, 45, 63, 89, 104  
 Milner, Lindsay 74  
 Milu, Suzette 53  
 Mirakovits, Kathy 26  
 Mitchell, Donald 28  
 Mitchell, Meridith 16  
 Mitchell-Eames, Monique 76  
 Modafferi, Meghan 28  
 Molik, Daniel 20  
 Monteiro, Leslie 72  
 Moon, Nancy 72  
 Moore, Roxanne 66  
 Moorzitz, Samantha 72  
 Moran, Renee 71, 85  
 Moravchik, Bruce 58, 84  
 Morgan, Emily 84  
 Moriarty, Ann 89, 104  
 Morrell, Patricia 39  
 Morris, Suzan 24, 87  
 Morrison, Deb 82  
 Morrison, Katie 56  
 Moser, Charlotte 28, 47  
 Moulding, Brett 19, 100  
 Moyer, Richard 49, 99  
 Muenz, Tara 89  
 Munshower, Paul 106  
 Murchison, Lizzie 17

Mussetter, Rebecca 109  
 Mwangi, David 112

## N

Nash, Bruce 82  
 Nazar, Christina Restrepo 38  
 Nelson, Lori 56  
 Nettles, Rhett 49  
 Neufeld, Sara 41  
 Neumeister, Patty 51  
 Newburger, Brian 92  
 Newman, Danielle 48, 74  
 Newton, Kristin 99  
 Niblett, Dana 112  
 Nocella, Michael 82  
 Novak, Deb 74  
 Novak, Michael 54  
 Nowicki, Stephen 63  
 Nunez, Elizabeth 94  
 Nusser, Allyson 56  
 Nyberg, Lisa 58

## O

O'Brien, Bernice 45  
 O'Connor, Dawn 66  
 O'Day, Elizabeth (Betsy) 49  
 Offit, Paul 47  
 Okor, Nyasha 93  
 Olson, John 55  
 Olson, Julie 36, 80  
 Oltman, Susan 20  
 O'Neal, Amy 104  
 Ortleb, Edward 33  
 Orwig, Allysa 38  
 O'Shoney, Daniel 80  
 Osmond, David 72  
 Ostlund, Karen 70  
 O'Sullivan, Jennifer 53, 66  
 Oszust, Steven 34

## P

Padilla, Michael 101  
 Page, Nicole 110  
 Palfy, Christina 71  
 Palmer, Roger 74, 87  
 Pappalardo, Sarah Quick 25  
 Paratore, Jeanne 110  
 Passow, Michael 71  
 Patrick, Elizabeth 85  
 Patterson, Matthew 112  
 Pattison, Donna 65



# Index of Participants

---

Paulsen, Susan 56  
Paulson, Nicole 100  
Paulson, Patricia 60, 65  
Pavek, Cara 53  
Peacock, Amy 96  
Peacock, Jeremy 33, 70, 96  
Pearce, Mary 60  
Pekarcik, Cara 30  
Penchos, Jessica 62, 89  
Pennock, Phyllis Haugabook 110  
Penrod, Candace 83  
Penuel, William 38, 75  
Perrotti, Alexandra 105  
Perry, Pamela 98  
Peters-Burton, Erin 42, 108  
Peterson, Jodi 80  
Peterson, Ryan 25  
Phelps, Travis 18  
Phillips, Molly 99  
Phillips, Stefanie 37  
Pike, Lisa 76  
Pirlo, Jeanette 99, 109  
Plank, Larry 83  
Plavchak, Lindsay 26  
Pollaro, Lisa 106  
Poodry, Frances 25, 88  
Popejoy, Kate 94  
Porter, Jennifer 37  
Porter, Yaquita 68  
Potter, Ashley 70  
Poulin, Alicia 110  
Prince, Marian 37  
Putnam, Dwight "Buzz" 28, 46  
Pylant, Shannon 82  
Pyle, Eric 39

## R

Rachel, Natalie 102  
Randolph, Jernita 15  
Reardon, Ryan 101  
Rechenberg, Jaime 64  
Reddick, Kristie 26  
Reilly, Brianna 20, 109  
Reiser, Brian 54, 99  
Remington, Jeffrey 50, 51, 80  
Renaud-Grant, Chantelle 85  
Rentfro, Lauren 23  
Rich, Steve 86, 95  
Richard, Craig 51  
Richey, William 46  
Rigling, Kathy 71

Ripollone, Diane 77  
Rivet, Ann 68  
Robinson, Priscilla 63  
Robles, Marilé Colon 37  
Roehrig, Gillian 39, 106  
Rogers, Susan 82  
Rogg, Steven 90  
Romano, Christina 88  
Roney, Sheri 108  
Roseman, Jo Ellen 25  
Ross, Robert 110  
Roy, Kenneth 51, 97  
Royce, Christine Anne 86, 98  
Royle, Maria 49  
Ruggiero, Lovelle 96  
Runyon, Cassandra 49  
Rupe, Katie 39  
Russell, Leslie 82  
Russell, Randy 100  
Rutland, Rick 61  
Ryan, Denise 50

## S

Sackett, Brett 24, 40  
Sanders, Christy 25, 44, 61, 88, 103  
Sanders, Stacie 72  
Sandifer, Cody 99  
Santiago, Alicia 60  
Sauer, Jennifer 17  
Schatz, Dennis 74  
Schenkel, Kathleen 38  
Scherben, Katrina 42  
Schinske, Jeff 55  
Schleith, Susan 96  
Schneider, Twila 109  
Schregardus, Randall 88  
Sears, Yanique 54  
Sebestik, Jana 85  
Secchiaroli, Dina 18, 108  
Sellers, Valerie 73  
Severance, Samuel 110  
Shane, Pat 68  
Shapiro, Lesley 84  
Shearer, Adrienne 89  
Shmaefsky, Brian 76  
Sicard, Mackenzie 74  
Simpkins, Renee 51  
Smith, Barrie 92  
Smith, Hope 112  
Smith, Sara 74  
Smolek, Tamara 29

Soeffing, Cassie 16  
Solarsh, Amanda 107  
Sotak, Bob 69  
Spanos, Barbara 54  
Spohler, Scott 37  
St. Clair, Gerri 85  
Stallard, Jaclyn 50, 51  
Stammen, Andria 78, 93  
Staples-Knox, Dawn 71  
Stark, Louisa 110  
Staudt, Carolyn 16, 37, 107  
Steffen, Peggy 58, 84  
Stein, Mary 98  
Steinhoff, Doug 62  
Steinman, Melissa 65  
Stephens, Kimberly 99  
Sterling-Laldee, Sarah 94  
Stevens, Nancy 15, 30  
Stewart, Erika 19  
Strishock, Lisa 69  
Stubbs, Tamica 27, 45  
Summer, Theresa 74  
Sumrall, Kelle 21, 50  
Sumrall, William 21, 50  
Sundberg, Cheryl 98  
Susko, Emily 51  
Susnis, Mary 25  
Sutliff, Concettina 72  
Sveiven, Scott 62  
Swanson, Katlyn 16  
Swanson, Robert 20

## T

Tai, Chihche 71, 85  
Taylor, Jonté 18  
Teres, Adeena 69  
Tesoriero, Gina 107  
Texley, Juliana 80, 95  
Thomas, Jeanette 82  
Thomas, Kianga 109  
Thomas, Ronnie 110  
Thombs, Dylan 111  
Thome, Kate 54  
Thompson, Kenneth 16  
Tidrick, Jordan 32, 42  
Tighe, Damon 46, 105  
Tingle, Scott 41  
Tippens, Nena 42  
Toliver, Heather 110  
Tonkinson, Rebecca 51  
Touitou, Israel 38  
Trackey, Joseph 92

Trawick, Cynthia 78  
Tripp, L. Octavia 108  
Truesdell, Joel 34  
Tucker, Deborah 86  
Tucker, Megan 20  
Tugel, Joyce 34  
Tushie, Jean 86, 97  
Tyler, Jennifer 110

## U

Udomprasert, Patricia 74  
Upton, Amanda 53

## V

Van der Eb, Marina 83  
Van der Veen, Wil 19  
Van Horne, Katie 29  
VanMeeteren, Beth 71  
Vasquez, Jo Anne 52  
Vaughan, Brendan 99  
Veal, William 39  
Veltre-Luton, Nicole 55  
Verma, Geeta 21  
Vernot, David 32, 78  
Vick, Matthew 15, 30  
Villa, Carlos 68  
Vinokur, Jeffrey 79  
Vogt, Gina 64, 91, 105  
Voyer, Christine 22

## W

Wade, Stacey 100  
Waibel, Bill 62  
Waite, Dora 99  
Walker, Megan 59  
Waller, LaTonya 51  
Wallmark, Laurie 66  
Walsh, Brenda 97  
Walters, Verle 43, 61  
Walthall, Sabrina 102  
Wang, Edward 26  
Wang, Laura 30  
Watanabe, Taiki 103  
Watkins, Douglas 38  
Watters, Brandon 89, 104  
Wehunt, David 18  
Weiss, David 105  
Weissman, Elizabeth 77  
Welch, MaryMargaret 86  
Wells, Darren 55  
Wells, Shelli 69

Wesolowski, Robert 18  
Westbrook, Anne 22, 110  
Wheeler, Deanna 99  
White, Donald 92  
Whitehead, Jolaine 70  
Whitney, Sharry 59, 101  
Whitt, April 20  
Wiehagen, Michele 52  
Wilkinson, Brianna 107  
Willard, Ted 21, 56, 70, 84, 99  
Williams, Cari 95  
Williams, Jeanie 83

Williams, Jennifer 84  
Williams, Karelle 53  
Williams, Tonia 44, 62  
Williams-Brown, Ann 69  
Wimberly, Nakeia 94  
Wininger, Lisa 20, 49  
Wood, Karan 29  
Woolfolk, Tonya 34, 69, 99  
Wuerth, Mary 63  
Wunder, Marc 74  
Wygant, Heather 56  
Wyssession, Michael 40, 59

### Y

Yonker, Jessica 44  
Yoon, Susan 17  
Young, Donna 98

### Z

Zabel, Ingrid 110  
Zagzebski, Kathy 107  
Zakutansky, Fran 24, 40  
Zeidler-Watters, Kimberly 19  
Zeis, Jodi 86

Zeller, Lisa 86  
Zemba-Saul, Carla 18  
Zepecki, Stephen 34  
Zhou, Lidan 17  
Ziegler, Michael 109  
Zike, Dinah 90  
Zimny, Judy 40  
Zitolo, Michael 30  
Zuis, Edmund 111  
Zych, Ariel 39











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|-------------------------------------------------------------------------------------------------------------------------------------------------|---------|
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